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Thesis Title: Tailoring Scientific Progress Towards the Fulfillment of the Right to Adequate Food: How to Move from Convolution to Interdependence

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List of Abbreviations

AAC	Agriculture Adjustment Act
ACHPRCom	African Commission on Human and Peoples Rights
AFOLU	Agriculture, Forest, and other Land Use
AOA	Agreement on Agriculture
AMS	Aggregate Measures of Support
BIT	Bilateral Investment Agreements
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CDM	Clean Energy Development Mechanism
CESCR	Committee on Economic, Social and Cultural Rights
CEDAW	Convention on the Elimination of all Forms of Discrimination Against Women
CERs	Certified Emission Reductions
CH4	Methane
CIT	Countries in Transition
COP	Committee of the Parties
CSO	Civil Society Organizations
CPR	Civil and Political Rights
CRC	Convention on the Right of the Child
CO2	Carbon Dioxide
CEITs	Countries that are Undergoing the Process of Transition into a Market Economy
DDR	Doha Development Round
DUS	Distinctiveness, Uniformity, and Stability
EC	European Community
EU	European Union
EST	Environmentally Sound Technology
ESCR	Economic, Social and Cultural Rights

FAO	Food and Agriculture Organization
FCCC	Framework Convention on Climate Change
FTA	Free Trade Agreements
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GHG	Green House Gas
GI	Genetically Improved
GM	Genetically Modified
GSP	Generalized Scheme of Preference
GURTS	Genetic Use Restriction Techlologies
FHCs	Hydrofluorocarbons
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICCPR	International Covenant on Civil and Political Rights
IGO	Inter-Governmental Organization
IGWG	Inter-Governmental Working Group
IFI	International Financial Institutions
IMF	International Monetary Fund
IPR	Intellectual Property Rights
IPCC	Intergovernmental Panel on Climate Change
ISI	Import Substitution Industrialization
ITO	International Trade Organization
ITOT	International Transfer of Technology
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
JI	Joint Implementation Mechanism
LDCs	Least Developed Countries
MDG	Millennium Development Goals
MFN	Most Favored Nation
MNCs	Multinational Corporations
MS	Member States
NAPA	National Adaptation Programmes of Action

NFIDCs	Net Food-Importing Developing Countries
N2O	Nitrous Oxide
NGO	Non-Governmental Organizations
NTB	Non-Trade Barriers
OECD	Organization for Economic Co-operation and Development
OP-CESCR	Optional Protocol to the International Covenant on Economic, Social and Cultural Rights
PFCs	Perfluorocarbons
PGR	Plant Genetic Resources
PGRFA	Plant Genetic Resources for Food and Agriculture
PVP	Plant Variety Protection
R & D	Research and Development
SAPs	Structural Adjustment Programs
SCM	Subsidies and Countervailing Measures
SF6	Hexafluoride
SDG	Sustainable Development Goals
SDT	Special and Differential Measures
SC	Schedule of Concession
SSG	Special Safeguards Measures
SSR	Social Science Research
TK	Traditional Knowledge
TOT	Transfer of Technology
TOT	Terms of Trade
TPP	Transpacific Partnership Agreement
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
TRQ	Tariff Rate Quota
UDHR	Universal Declaration of Human Rights
UPOV	International Union for the Protection of New Plant Varieties
URAOA	Uruguay Round Agreement on Agriculture
UN	United Nations

UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDP	United Nations Development Program
UNGA	United Nations General Assembly
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environmental Program
UNCTAD	United Nations Conference on Trade and Development
UNCED	United Nations Conference on Environment and Development
UNWMO	United Nations World Meteorological Organization
U.S.	United States of America
Voluntary Guidelines	Voluntary Guidelines for the Progressive Realization of the Right to Adequate Food in the Context of National Food Security
WB	World Bank
WFS	World Food Summit
WFS-fyl	World Food Summit Five Year later
WIPO	World Intellectual Property Organization
WMO	World Meteorological Organization
WTO	World Trade Organization

Chapter One: Introduction, Methodology, and Goals of the Research

1.1. Introduction

The right to food is a well recognized human right under international law. This assertion is to be made because the right has been made an integral part of the contemporary international human right system since the adoption of the Charter of the United Nations.[1] Accordingly, as a precursor to this international effort, the Universal Declaration of Human Rights (hereinafter, UDHR)[2] has made reference to the right of everyone to an adequate standard of living to be inclusive of, *inter alia*, food. Thereafter, the stamina for the adoption of a legally binding obligation towards human rights in general (as inclusive of civil, political, economic, social and cultural rights) had led to the adoption of two binding human rights instruments, the International Covenant on Economic, Social and Cultural Rights (hereafter, ICESCR)[3] and the International Covenant on Civil and Political Rights (hereafter, ICCPR).[4]

As will be discussed in detail under chapter two of this research, the right to food has been made part of the ICESCR (Article 11) as a right to an adequate standard of living including, among other things, adequate food.[5] The adoption and entry into force of the ICESCR has marked an important endeavor because the State Parties that have adopted the Covenant (through ratification or accession[6]) became duty bound to fulfill the obligations as enshrined in general including those towards the right to adequate food.[7] Moreover, the right was granted more specification as State Parties were obligated to be cognizant of the fundamental right of everyone to be free from hunger[8] and to that end to take such action, individually and through international cooperation, as will be needed to improve methods of production, conservation, and distribution of food.[9] In addition to the enunciation in such international human rights documents, a plethora of human rights instruments dealing with various points of focus, regional human right instruments, and non-binding instruments as produced notably by the Food and Agriculture Organization (hereafter, FAO), the Human rights Commission,

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[1] See, United Nations, Charter of the United Nations, October 24 1945, 1 UNTS XVI.

[2] United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III: Article 25 (1). The provision specifically enumerates that everyone has "the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services...".

[3] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.: Article 11.

[4] Ibid, 171.

[5] Ibid. The provision specifically recognizes "...the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions".

[6] United Nations, Vienna Convention on the Law of Treaties, 23 May 1969, United Nations, Treaty Series, vol. 1155, p. 331.: Article 2 (1) (b)., The Convention provides that the international acts of "Ratification", "acceptance", "approval" and "accession" are means by which a State establishes on the international plane its consent to be bound by a treaty

[7] George Kent, Freedom from Want: The Human Right to Adequate Food, (Georgetown University Press, Washington D.C: 2005).

[8] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.: Article 11 (2).

[9] See, United Nations General Assembly, International Covenant on Economic, Social and Cultural Rights, 16 December 1966, in force, 3 January, 1976, U.N, United Nations, Treaty Series, vol. 993: Article 11(2) (a).

and the Committee on Economic, Social and Cultural Rights (hereinafter, CESCR), have dealt with the right to food.[10]

Building on these developments through which the legal basis of the right to food has been settled, the CESCR[11] has, as of 1999, adopted its authoritative interpretation to Article 11 of the ICESCR, as such, clarifying the core contents as well as obligations incumbent on State Parties towards its full realization. In the light of this, the CESCR has provided that, as a minimum core obligation[12] they have assumed under the ICESCR, the State Parties to the Covenant must act immediately "to mitigate and alleviate hunger even in times of natural or other disasters".[13] The CESCR has furthermore provided the normative contents of the right to adequate food as such establishing the elements that will serve as the litmus test in order to ensure its realization.[14] Thus, the normative contents of the right to adequate food have been clarified to include both the availability and accessibility of adequate food to the public.[15] As such, the right to food is to be realized progressively[16] when, "every man, women, and child along or in community with others has physical and economic access to adequate food and means of procurement".[17] In this respect, State Parties to the ICESCR[18] are duty bound to implement the obligations enshrined in the Covenant. To this end, as will be explored further under chapter two of the research, the CESCR provides that, similar to other economic, and social rights, the State Parties have assumed obligations to respect, protect and fulfill the right to food towards the public.[19]

Even though the main focus of this research is concerned with unpacking factors that have restrained the progressive realization of the right to food by the State Parties to the ICESCR, it also attempts to explicate the topic from the vantage point of the right of everyone to enjoy the benefits arising out of scientific innovations and its application (hereafter, the right to science) as enshrined in international human rights documents. This is because, similar to the right to food and other economic and social rights, the right to science has been enshrined in

[10] The Right to Food: Guide for Legislating on the Right to Food, (Rome, FAO 2009).
[11] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12: The Right to Adequate Food (Art. 11)," Adopted at the Twentieth Session of the Committee on Economic, Social and Cultural Rights, E/C.12/1999/5, (12 May 1999).
[12] For more on this, see, Katharine Young, "The Minimum Core of Economic and Social Rights : A Concept in Search of Content", Yale Journal of International Law, Vol. 33, No. 1, (2008).
[13] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 6.
[14] Ibid, Paragraphs 8, 12 and 13.
[15] Ibid, Paragraph 8.
[16] See, The United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3: The Nature of State Parties' Obligations (Art. 2, Para. 1, of the Covenant)", Adopted at the Fifth Session of the Committee on Economic, Social and Cultural Rights, E/1991/23, (14 December 1990)., By making use of all appropriate means
[17] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): paragraph 6.
[18] As of September 2018, the ICESCR has 168 Signatories, See, United Nations Treaty Collection, Accessed on 01/02/2018, Available at, https://treaties.un.org/pages/ViewDetails.aspx?src=IND&mtdsg_no=IV-3&chapter=4&lang=en
[19] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999); Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999).

international human rights instruments, notably the UDHR (Article 27(1))[20] and the ICESCR (Article 15(1) (b)).[21] As will be further explored under chapter two, the enunciation of this provision in both human right instruments explicates the right of everyone to be able to enjoy the benefits that are to emanate from scientific endeavors.[22] The stipulation of the right to science in both legal instruments presents science as an integral component by which societies are to progress through the instrumentality of scientific innovations.

In spite of this due recognition granted to the right to science in international - as well as regional[23] - human rights instruments, there still lacks clarity as regards its core contents and possible State obligations that are to be derived from it.[24] One evident reason for this lag has been the fact that the CESCR has not yet adopted a General Comment on the right through which it would have provided its authoritative interpretation to the provision.[25] Currently, the CESCR is under discussion with the aim of providing clarity to this right.[26]

Given this general background, to date, in both academic and the above mentioned legal endavours conducted thus far, science has been approached as an avenue to realize human rights or on the contrary as a detriment for the realization of the same.[27] This has taken place because, as elaboratley discussed by the Special Rapporteur in the Field of Cultural Rights, the approach thus far taken considers the right to science either as a vehicle for the realization of other human rights[28] with a view to address 'the needs common to all humanity'[29] or on the opposite side in relation to, 'potentially adverse consequences for the integrity, dignity and human rights of the individual'.[30] Therefore, according the Special Rapporteur, we need to

[20] United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III: Article 27 (2).
[21] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.: Article 15 (1) (b).
[22] Ibid; United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III: Article 27 (2).
[23] For more, see, Organization of the Islamic Conference (OIC), Cairo Declaration on Human Rights in Islam, 5 August 1990; Organization of American States (OAS): Article 42., Additional protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, ("Protocol of San Salvador"), 16 November, A-52: Article 14; African Union, Protocol tot eh African Charter on Human and People's Rights on the Right of Women in Africa, (July 11, 203): Article 4 (1) (h) and 12 (2) (b); European Union, Charter of Fundamental Rights of the European Union, (October 26, 2012), 2012/C 326/02.: Article 13.
[24] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012); Lea Shaver, "The Right to Science: Ensuring that Everyone Benefits from Scientific and Technological Progress", European Journal of Human Rights 2015/4, (2015): 411-430. http://dx.doi.org/10.2139/ssrn.2564222.
[25] Audrey Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", Journal of Human Rights, 8:1, (2009): 1-36, DOI: 10.1080/14754830802701200.
[26] Sebastian Porsdam,Yvonne Donders, C. Mitchelle, et al., "Advocating for Science as a Human Right", Vol. 115, No. 43., PNAS (2018).
[27] Chapman, "Towards an Understanding of the Right to Science".
[28] See, Olivier De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food: From Conflict to Complementarity", Human Rights Quarterly, vol. 33, No. 2, (2011): 304-350; Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).
[29] Declaration on Social Progress and Development, General Assembly resolution 2542 (XXIV): Preamble.
[30] Vienna Declaration and Programme of Action, World Conference on Human Rights, A/CONF157/24 (Vienna , June 1993).

move beyond this truism towards considering the right to science as a right in and of itself.[31] With this due consideration, this research vows to examine the manner in which this one-sided conceptualization has reneged on the full enjoyment of the right to food as such providing an academic contribution to the endeavor towards its clarity.

With this general background in mind, this research aims to illustrate how the lack of proper understanding regarding the nature of the relationship between that of the right to science and the right to food has resulted is reneging the realization of the latter.[32] The reason for this lies in how science has been defined and approached for a long time. This has been so because rather than being conceived as a human right in and of itself, science is deemed, either as a tool for the realization of other human rights or in terms of its negative impact for the realization of the same.[33] When this assertion is examined in the light of the focus of this research, i.e., the right to food, there is a tendency to approach the right to food and that of scientific advancements as mutually supportive in that to the extent that there is scientific progress, to see this as a ready-made solution for averting the problem of food insecurity.[34]

Notwithstanding the fact that scientific progress has contributed and still continues to support food production, the manner in which the relationship has been constructed thus far - that is to consider scientific advancements as a one-way remedy for ensuring food security - may need to be modified.[35] Any future attempt aimed at addressing this conceptualization will require a thorough investigation into which form of scientific progress should be promoted and an assessment to which kinds of scientific advancements access should be facilitated.[36] Therefore, this research aims to illustrate that the current approach which views scientific advancements as a panacea for the realization of the right to food (as well as other human rights), needs to be modified if scientific advancements are to tailor to their intended beneficiaries.[37]

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[31] See, De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food: From Conflict to Complementarity", 304-350; Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).

[32] Ibid; UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009).

[33] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).

[34] De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food", 304-350; Kerstin Mechlem and Terri Raney, "Agricultural Biotechnology and the Right to Food", in Biotechnologies and International Human Rights 131 (Francesco Francioni ed., 2007); UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009).

[35] See, De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food", 304-350; Mechlem and Raney, "Agricultural Biotechnology and the Right to Food"; UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009)., Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).

[36] See, De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food", 304-350; Mechlem and Raney, "Agricultural Biotechnology and the Right to Food".

[37] See, De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food", 304-350., UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009); Human Right Council, Report of the Special Rapporteur in the field of

As illustrative cases in point to demonstrate the above one-sided assumption, this research divulges into three areas wherein the upshots of this conceptualization have taken place. Accordingly, three chapters of the research (chapters three, four and five) will examine how this tendency - to view science as a sole remedy to addressing concerns related to food security - has led to a derailment on the realization of the right to adequate food. Accordingly, the research scrutinize firstly the restrictions that ensue from the rules which guide the conduct of international trade by focusing on the Agreement on Agriculture (hereinafter, AOA).[38] The research examine secondly, the concerns related to the restrictions that emanate from the growth and expansion of Intellectual Property Rights (hereinafter, IPRs) protection - specifically that of Patent protection in plant related innovations- by focusing on the Agreement on Trade-Related Aspects of Intellectual Property Right (hereafter, TRIPS)[39] and the International Union for the Protection of New Plant Varieties (hereinafter, UPOV).[40] Thirdly, the research inspects the concerns that emanate from climate change (with specific reference to high temperature and most intense and severe weather conditions) by making reference to the United Nations Framework Convention on Climate Change (hereafter, UNFCCC) and its Kyoto Protocol.[41]

Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).

[38] See, Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 410.

[39] See, Agreement on Trade-Related Aspects of Intellectual Property Rights (hereafter, the TRIPS Agreement) 15 Apr. 1994, 1869 U.N.T.S. 299, entered into force on 1 January 1995.: Article 27.

[40] See, International Convention for the Protection of New Varieties of Plants 2 Dec. 1961, 33 U.S.T. 2703, 815 U.N.T.S. 109 (revised 19 Mar. 1991).

[41] See, United Nations Framework Convention on Climate Change (FCCC), May 9 1992, 31 I.L.M. 849 (1992)., Kyoto Protocol to the Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22 (1998).

1.2. Research Questions

Taking into consideration the above general background, the research aims to give an answer to the following research questions;

1. Has international trade restrained the realization of the right to food? If so, how has this taken place? In order to answer this research question, the research zooms into the AOA. The research demonstrates that the underlying rules through which the agreement is guided by is one-sided in that the rules are formulated to be in line with the interests of developed country Member States. Thus, the research illustrates that the rules that guide international trade in agriculture, have left developing county State Parties in a disadvantageous position to equitably benefit from international trade as a consequence restraining their ability to ensure the realization of the right to food. In providing an answer to this research question, the research also investigates how the manner in which the transfer of technology is being carried out in international trade transactions - specifically related to technical and scientific innovations in the agricultural sector - has not given due recognition to the right to science.

2. Is the realization of the right to food being hampered by the international IPRs regime? If in the affirmative, how has this taken place? Making use of the TRIPS provisions in general and those related to the protection of plant varieties[42], the research scrutinizes the tension which currently exists between IPRs protection being granted to innovators, agribusiness Multinational Corporations (hereafter, agribusiness MNCs) mainly in the seed sector and the right to food. Parallel to this, it also inspects the International Union for the Protection of New Varieties of Plants (hereafter, UPOV) as an alternative way of plant variety protection. Under this milieu, other parallel quests are posed so as to answer the research question. Accordingly, the research examines how the exclusive rights protection regime under both systems of protection, has at the same time reneged on the accessibility of scientific results (such as Genetically improved seeds) to the public.

3. Does industrial agricultural production hasten human-induced climate change occurrences as such impeding the realization of the right to food? If so, how has it taken place? With the view to answer the research question, the research examines how the manner by which industrial food production is being carried out has exacerbated adverse anthropogenic (human-induced)[43] causes of climate change as a consequence restraining the full enjoyment of the right to food. Furthermore, it scrutinizes how the lack of effective transfer of environmentally sound technologies (hereafter, EST) by developed countries towards those

[42] See, Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 410.: Article 27 (3) (b).
[43] See, Intergovernmental Panel on Climate Change, Climate Change: The Scientific Assessment, (Cambridge University Press,1990).

most vulnerable developing countries, has led to a restriction on the enjoyment of the right to science.[44]

1.3. Research Goals

This research aims to build upon a plethora of studies[45] conducted thus far that investigated factors that have derailed the full realization of the right to adequate food by the State Parties to the ICESCR. Even though these studies have examined various factors to be behind this lag, there is a consensus which is to be witnessed on the prevalence of food insecurity as well as on the realization that lack of food availability is no longer the sole reason behind.[46] Thus, the results of the respective studies have concurred that the problems of hunger and food insecurity are still widespread.[47] Furthermore, they have confirmed that the causes of hunger and malnutrition, as will be explored further under chapter two, do not solely lie beneath lack of food availability but mainly that of food inaccessibility.[48] Notwithstanding this growing understanding (scientific as well as academic) behind the prevalence of food insecurity and the underlying causes behind, there is a tendency to consider scientific advancements and the results of scientific innovations to be a panacea for addressing the problem of food

[44] See, UN General Assembly, International Covenant on Economic, Social and Cultural Rights, 16 December 1966, United Nations, Treaty Series, vol. 993: Article: 15(1)(b); Report of the Special Rapporteur in the field of cultural rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, presented at the Twentieth Session of the Human Rights Council (2012) (A/ HRC/20/26)

[45] For more, see, Kent, Freedom from Want; Bart F.W. Wernaart, The Enforcebility of the Human Right to Adequate Food: A Comparative Study, (Wageningen University, Wageningen: 2013); Ying Chen, Trade, Food Security, and Human Rights The Rules for International Trade in Agricultural Products and the Evolving World Food Crisis, (Ashgate, England: 2014); Otto Hospes & Irene Hadiprayitno, eds., "Governing Food Security: Law, politics and the Right to Food", (Wageningen Academic Publishers, The Netherlands: 2010): 83-84; Universal Declaration of Human Rights, G.A- Res. 217(111), U.N. Doc. Al RES/217, (1948); Philip Alston, "International Law and the Human Right to Food", In The Right to Food 9, 22 (Philip Alston & Katarina Tomasevski eds., 1984) (Martinus Nijhof, Utrecht, The Netherlands: 1984); Asbjourn Eide, "The right to an adequate standard of living including the right to food", In Economic, Social and Cultural Rights: A textbook, 2nd ed., (Asbjørn Eide, Catarina Krause, and Allan Rosas), (Martinus Nijho*f*, Dordrecht, The Netherlands: 2001); Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2001/53, (February 7 2001); Jean Ziegler, C. Golay, C. Mahonet al., The Fight for the Right to Food, Lessons Learned, (Palgrave Macmillan, UK: 2011); Kent, Freedom from want,.

[46] Ziegler, Golay, Mahon et al., The Fight for the Right to Food, Lessons Learned; Kent, Freedom from want; Olivier de Schutter, "International Trade in Agriculture and the Right to Food" in Accounting for Hunger: The Right to Food in the Era of Globalization, (Olivier De Schutter and Kaitlin Y Cordes. , eds) (UK., Hart Publishing, 2011); Kent, Freedom from Want;.

[47] Ziegler, Golay, Mahon et al., The Fight for the Right to Food, Lessons Learned; Kent, Freedom from want; De Schutter, "International Trade in Agriculture and the Right to Food"; FAO, IFAD, UNICEF, WFP and WH FAO, IFAD, UNICEF, WFP and WHO. The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition, (Rome, FAO: 2018). The State of Food Security and Nutrition in the World 2017. Building Resilience for Peace and Food Security, (Rome, FAO: 2017).

[48] Olivier De Schutter, "Seed Policies and the Right to Food: Enhancing Agrobiodiversity, Encouraging Innovation", Report by Special Rapporteur on the Right to Food, U.N. GAOR, 64th Sess., (2009), U.N. Doc. A/64/170; Philippe Cullet, "Food Security and Intellectual Property Rights in Developing Countries", IELRC Working Paper 3, (International Environmental Law Research Centre, Geneva, Switzerland: 2003); Amartya Sen, Poverty and Famines: An Essay on Entitlements and Deprivation, (Clarendon Press, Oxford: 1981).

insecurity.[49] Cognizant of this consideration, this research tries to illustrate that even though scientific advancements have been noteworthy in terms of accelerating food production, the tendency to approach scientific innovations as a solution to addressing food insecurity in and of themselves has had its shortfalls.[50] Therefore, the research attempts to make an academic contribution by divulging that the contemporary conceptualization of how the right to food is to benefit from scientific advancements requires a reformulation.

With the purpose to achieve the goals, the research provides descriptive and analytical discussion on the right to food. Accordingly, a descriptive approach which refers to the conduct of research by making use of "surveys as well as searching facts on different phenomenon through enquiries" is used so as to provide description into an existing or current situation.[51] Hence, the descriptive part of the research explicates the right to food as contained under international law (mainly referring to the ICESCR), United Nations Human Right Bodies (like the CESCR), based on the rules of interpretation as provided under the Statuee of the International Court of Justice.[52] Moreover, building on the ICESCR, reference will also be made to regional human right documents and some national law so as to examine the extent to which the right to food has been integrated into the respective legal framework. Moreover, as will be discussed further in chapter two, such an examination is also crucial in order to check if the right to food has been incorporated with enforceable obligations at the national and regional levels especially for States Parties that have signed the Optional Protocol[53] to the ICESCR such that violations by the State concerned or that of third parties, can be addressed effectively.

In addition to this, a descriptive approach is utilized with the view to clarify the nature of obligations and core objectives respectively of the UDHR, the UNFCCC, its Kyoto Protocol, the General Agreement on Tariffs and Trade (hereafter, GATT), AOA, the TRIPS Agreement and the UPOV Convention.

As indicated above, the research will also make use of an analytical approach. This approach is utilized witht he view to "examine facts or analyze the given information to make conclusions".[54] Hence, the analytical part of the research will examine how the above-noted description of the legal framework into the international rules that guide the protection of IPRs, the environment, and, international trade, have resulted in putting restrictions on the full enjoyment of the right to food.

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[49] Shaver, The Right to Science", 411-430; UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009).

[50] Ibid; De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food", 304-350.

[51] George Kanire, Social Science Research methodology: Concepts, Methods and Computer Applications, (GRIN Verlag, Munich: 2013).

[52] *United Nations, Statute of the International Court of Justice, 18 April, 1946.(Article 31).*

[53] International NGO Coalition for an Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, "Celebration of the Entry into Force of the OP-ICESCR", 2013. United Nations General Assembly, "Optional Protocol to the International Covenant on Economic, Social and Cultural Rights", Resolution Adopted by the General Assembly, A/RES/63/117, (March 5 2009).

[54] Kanire, Social Science Research methodology,.

1.4. Research Method

Accordingly, in order to answer the research questions raised above, the research employs a qualitative research method which "...involves an interpretive, naturalistic approach to the world....in which researchers...study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them".[55] This said however, there lacks one accepted way for conducting qualitative research.[56] This is mainly because the approach taken is for the most part dependent upon, among other things, the researchers' "...beliefs about the social world, what can be known about it (ontology), the nature of knowledge and how it can be acquired (epistemology), the purpose(s) and goals of the research...".[57] With this due consideration, qualitative research methods are to be used in order to answer the research questions posed above that necessitate explanation or understanding of the social context from which they are derived.[58]

The general method to be utilized in the research which refers to the approach chosen in order undertake research[59] is desktop research. With the purpose to do so, the research has consulted both primary as well as secondary sources of data in order to answer the above-discussed research questions. Additionally, with due consideration to the growing importance of soft-law instrunments in influensing State conduct and behaviour, the esearch consults soft-law instrunments.[60] Such legal instunments are used to refer to "gradually emerging patterns of behaviour which are not legally binding".[61] Thus this implies that when compared to hard-law instrunments, they are short in terms of creating a binding legal effect on the State Parties to the ICESCR.[62] Nevertheless, to the extent that such legal documents have the potential to influence State behavior and may be complied with State conduct that will be accepted under international law, this research consults such instrunments.[63]

Furthermore, a legal analysis will also be conducted so as to answer the research questions posed. As such, the analytical, as well as descriptive parts of the research, will make use of primary, secondary sources of data as well as legal analysis.

Accordingly, this research makes use of international treaties as a primary source of international law based on the rules of interpretation as provided by the Statute of the

[55] Denzin, N.K. and Lincoln, Y.S. (eds), Handbook of Qualitative Research, (Sage, Thousand Oaks, Californian: 1994).
[56] Dawn Snape and Liz Spencer, "The Foundation of Qualitative Research", in Qualitative Research Practice: A Guide for Social Science Students and Researchers, (Jane Ritchie and Jane Lewis, eds.) (Sage Publications, London: 2003).; Bård A. Andreassen et al., "Human Rights Research Method," In Research Methods in Human Rights: A Handbook, (Bård A. Andreassen et al., eds.,) (Edward Elgar, Cheltenham, UK & Northampton, MA, USA:2017):5.
[57] Snape and Spencer, "The Foundation of Qualitative Research".
[58] Ibid.
[59] Andreassen et al., "Human Rights Research Method,".
[60] FAO, The Right to Adequate Food, Factsheet No. 34, (Geneva, FAO and the High Commissioner for Human Rights, 2010).
[61] Eibe Riedel, "Standards and Sources. Farewell to the Exclusivity of the Sources Triad in International Law?", *European Journal of International Law***,** Volume 2, Issue 2, (1991): 58–84, https://doi.org/10.1093/oxfordjournals.ejil.a035793.
[62] See, Sollner, The Breakthrough of the Right to Food, 391-415.
[63] Ibid.

International Court of Justice.[64] In this regard the research will mainly rely on the ICESCR in order to enrich both the descriptive as well as analytical parts. In addition to this, the research also draws examples from other primary sources of data such as the International Covenant on Civil and Political Rights (ICCPR)[65], UDHR[66], TRIPS agreement[67], UPOV[68], the UNFCCC[69], Kyoto Protocol[70], GATT[71], and the AOA.[72] Aside from these, the research consults other treaties that make reference to the right to food although they are mainly concerned with different points of focus; the Convention on the Rights of the Child (CRC)[73], the Convention on Persons with Disabilities[74], the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)[75] and the Geneva Conventions and protocols[76] dealing with humanitarian law in the context of armed conflicts with the respective beneficiaries of the treaties, *inter alia*, prisoners of war, and civilians.[77] Furthermore, reference is made to regional human right instruments with the view to explore the enunciation of the right to food under the respective documents. As such, the research

[64] See, Martin Scheinin, "The art and science of interpretation in human rights law", in Research Methods in Human Rights: A Handbook, (Bård A. Andreassen et al., eds.,) (Edward Elgar, Cheltenham, UK & Northampton, MA, USA:2017):20; United Nations, Statute of the International Court of Justice, 18 April, 1946.: Article 38 (1), (a-c). ; The Provision mainly discusses the rules of interpretation to be utilized by the ICJ in its decisions. For this purpose, the court is authorized to apply, a. international conventions, whether general or particular, b. international custom, as evidence of a general practice accepted as law; c. the general principles of law recognized by civilized nations; and d. judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law.

[65] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.

[66] United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III).

[67] See, The TRIPS Agreement.

[68] International Convention for the Protection of New Varieties of Plants 2 Dec. 1961, 33 U.S.T. 2703, 815 U.N.T.S. 109 (revised 19 Mar. 1991).

[69] See, United Nations Framework Convention on Climate Change (FCCC), May 9 1992, 31 I.L.M. 849 (1992).

[70] Kyoto Protocol to the Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22 (1998).

[71] GATT 1994: General Agreement on Tariffs and Trade 1994, Apr. 15, 1994.

[72] Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 410.

[73] See, The United Nations General Assembly, 1989, "Convention on the Rights of the Child", Adopted 20 Nov. 1989, G.A. Res. 44/25, U.N. GAOR, 44th Sess.: Article 27(3).

[74] Ibid, Article 28.

[75] United Nations General Assembly, Convention on the Elimination of All Forms of Discrimination Against Women, 18 December 1979, G.A. Res.,34/180, United Nations, Treaty Series, vol 1249.: Article 12(2).

[76] Geneva Conventions and Protocols that give due recognition to the right to food include; International Committee of the Red Cross (ICRC), Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (First Geneva Convention), 12 August 1949, 75 UNTS 31: Articles 32 (2) and Article 27; International Committee of the Red Cross (ICRC), Geneva Convention Relative to the Treatment of Prisoners of War (Third Geneva Convention), 12 August 1949, 75 UNTS 135: Articles 20, 26, 28, 46, 51 and 72;, International Committee of the Red Cross (ICRC), Geneva Convention Relative to the Protection of Civilian Persons in Time of War (Fourth Geneva Convention), 12 August 1949, 75 UNTS 287: Articles 15, 23, 49, 50, 55, 59, 76, 87, 89, 100, 108 and 127; International Committee of the Red Cross (ICRC), Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977, 1125 UNTS 3: Articles 54, 69 and 70; International Committee of the Red Cross (ICRC), Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977, 1125 UNTS 609: Articles 5, 14, 18.

[77] Geneva Convention Relative to the Protection of Civilian Persons in Time of War (Fourth Geneva Convention), 12 August 1949, 75 UNTS 287; International Committee of the Red Cross (ICRC), Geneva Convention Relative to the Treatment of Prisoners of War (Third Geneva Convention), 12 August 1949, 75 UNTS 135.

consults, the African Charter on the Rights and Welfare of the Child (1990)[78] and the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa (2003),[79] the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, known as the Protocol of San Salvador (1988)[80], the Cairo Declaration on Human Rights in Islam[81], the European Charter of Fundamental Human Rights of the European Union (EU) [82] and the Asian Human Rights Charter.[83]

In this vein, the research additionally relies on publications by the United Nations Specialized Agencies such as the FAO, studies prepared by the United Nations Environmental Program (hereafter, UNEP) as an agency of the United Nations, United Nations Conference on Trade and Development (hereinafter, UNCTAD), the World Trade Organization (hereafter, WTO), and Reports as prepared by the Special Rapporteur on the right to food.

The research also uses secondary sources of data. In this respect, the secondary sources, among others, comprise of case laws which have been consulted with a view to back up the analysis with practical input. In this context, even though several cases laws (predominantly within the domestic legal system) are prevalent, the research relies only on some of the most relevant case laws.

[78] The African Charter on the Rights and Welfare of the Child gives recognition to the right of children to nutrition in Article 14 (2) (c), (d) and (h) in the context of the right to health and health services., Organization of the African Unity (OAU), African Charter on the Rights and Welfare of the Child, 11July 1990, CAB/LEG/24.9.49 (1990).

[79] African Union, Protocol to the African Charter on Human and People's Rights on the Right of Women in Africa, 11 July, 2003. The Protocol deals with the right to food in Article 15 while under Article 14 (2) (b), it gives due recognition to the right of pregnant and breastfeeding women to nutrition. Moreover, the Organization of African Unity (OAU) adopted the African Charter on the Rights and Welfare of the Child that explicitly recognizes the right to adequate food in under Articles 14 and 20., See, Organization of African Unity (OAU), African Charter on the Rights and Welfare of Children, 11 July, 1990: Article 14 and 20. In addition to this, in 2009, the AU has adopted the African Union Convention for the Protection and Assistance of Internally Displaced Persons in Africa, Kampala Convention. In this convention the States Parties pledge themselves to provide internally displaced persons with adequate humanitarian assistance, including food and water. Moreover, members of armed groups are "...prohibited from denying internally displaced persons the right to live in satisfactory conditions of dignity, security, sanitation, food, water, health and shelter… See, African Union, African Union Convention for the protection and Assistance of Internally Displaced persons in Africa, ("Kampala Convention"), 23 October, 2009: Article 9(2)(b) and 7(5)(c).

[80] Organization of American States (OAS), Additional protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, ("Protocol of San Salvador"), 16 November, A-52. For instance, Article 12 of the Protocol of San Salvador recognizes the right to food. The article provides that, "Everyone has the right to adequate nutrition which guarantees the possibility of enjoying the highest level of physical, emotional and intellectual development". Moreover, under Article 17, the right is addressed in relation to the protection of the elderly.

[81] Organization of the Islamic Conference (OIC), Cairo Declaration on Human Rights in Islam, 5 August 1990. The Cairo declaration under Article 17(c) provides that "States shall ensure the right of the individual to a decent living that may enable him to meet his requirements and those of his dependents, including food, clothing, housing, education, medical care and all other basic needs".

[82] European Union, Charter of Fundamental Rights of the European Union, 26 October 2012, 2012/C 326/02: Article 34. Although a direct reference is not made to the right to food, several provisions of the European Social Charter (as revised in 1996)., may implicitly be connected to it. See for example, Council of Europe, European Social Charter, 18 October 1961, ETS 35: Article 3, 4(1), 7, 8, 12, 13, 14, 16 and 19.

[83] See, Regional Treaties, Agreements, Declaration and Related, Asian Human Right Charter, 17 May 1998: Article 7(1).

In addition to this, the research makes use of other types of secondary sources. In this regard, the research has consulted books, academic journals, conference proceedings, working papers and many others. More specifically in this context, the research has consulted these secondary sources of data both from online and printed sources. As for the latter sources, the research has accessed the relevant materials from the University of Turin. More particularly, Norberto Bobbio Library of the University of Turin has served as the main source. In addition to this, printed materials have also be accessed from the Max Planck Institute for Comparative Public Law and International Law. Most of the materials at the Max Planck have been accessed during the visiting stay (guest researcher) which was conducted by the researcher.

The research has also consulted several open access online sources. In this context, while the Tutti Libri of the University of Turin has served as the main source to access the online source, the research has relied on other relevant open access online sources. As a case in point, the research has accessed open access online sources from Cambridge, Oxford University, JSTOR, and Social Science Research (SSR). Publications by Inter-governmental organizations such as the South Center and the FAO are among the open access online sources the research has relied on.

1.5. Structure of the Research

In tandem with the current chapter, the research is divided into six chapters. Building on the general framework this chapter provides, chapter two of the research is devoted to explicating the legal basis of the right to food under international law. In this respect, the chapter examines both a historical and legal basis of the right to food mainly under the UDHR (Article 25(1))[84] and the ICESCR) (Article 11).[85] The chapter likewise draws on other human rights instruments that deal with the right to food and different international efforts that played a major role in spurring the international consensus on the right to adequate food. Furthermore, the chapter divulges into an examination of the second focal point of analysis for this research; related to the right to science as enshrined in international human rights documents, notably the UDHR (Article 27(1))[86] and ICESCR (Article 15(1) (b)).[87]

The third chapter scrutinizes how the rules by which international trade in Agricultural commodities is guided by (AOA) have restrained the realization of the right to food? The first section provides an overview of the liberal assumptions about the benefits of trade in general, and how such assumptions are expected to enhance food security and the limits inherent thereof. The second section will discuss the GATT trade agenda. With the view to answer the question posed above, the subsequent section examines how the rules which guide international trade in agricultural commodities (AOA) has reneged on the full enjoyment of the right to food. The last part of the chapter will investigate how the manner in which the rules that underlie the AOA has not given due recognition to the right of everyone to benefit from the results of scientific progress.

The fourth chapter aims at giving an answer to the above-noted research question, how is the realization of the right to food being hampered by the international IPRs regime? In order to answer to the quest at hand, the chapter explores how the TRIPS rules on the protection of plant varieties tighten the right to adequate food. In order to do so, the chapter is structured in the following way. The first section synopsizes the nature of rights and obligation enshrined under the TRIPS Agreement dealing with IP protection. With a specific focus on Patent, the second section will look at options that are available for Member States of the WTO to provide protection to plant varieties. The third part of the chapter explores the UPOV convention with the view to uncover the rights and obligations entailed. The subsequent section examines two Acts of the UPOV Convention (1978 and 1991). The next section is devoted to an assessment of the flexibilities as provided under the TRIPS Agreement thereby scrutinizing the extent to which they can be relied upon by the Member States to realize the right to food. With the aim of exploring an answer to the research question raised, the next

[84] United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III: Article 25(1).
[85] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.: Article 11.
[86] United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III: Article 27(1).
[87] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.: Article 15(1) (b).

two sections analyze how the full enjoyment of the right to food is tightened by Patent and Sui Generis system of plant variety protection.

The fifth chapter is devoted to an examination of how the realization of the right to food is restrained by human-induced causes of climate change. With the purpose to do so, the first section uncovers the prelude to the international effort to address climate change. The following section explores the international legal framework on climate, by looking into the UNFCCC, the Kyoto Protocol and the Paris Climate Agreement. This is followed by the third section that looks into the two-sided face of agriculture both as a cause of emission as well as a direct victim of increases in Green House Gas (GHG). The fourth section examines how the full enjoyment of the right to food has been constrained by human-induced causes of climate change. The fifth section examines response mechanisms, mitigation, and adaptation, that are aimed at addressing climate change. The final section unravels how the right to benefit from science is restrained by the ineffective implementation of the transfer of EST obligations.

The final chapter presents the conclusions reached in the research.

Chapter Two

The Right to Food and the Right to Science

2.1. Introduction

The grave global concerns of hunger and malnutrition are on the rise. This is according to the State of Food Security in the World[88], conducted by the United Nations Food and Agriculture Organization (hereinafter, FAO). The study has revealed that in 2016 the number of undernourished people in the world has increased to an estimated 815 million which is up from 777 million in 2015.[89] As a driving force behind this hike, this finding has attributed violent conflict to have caused greater food insecurity.[90] A follow-up study carried out the following year has divulged that there is evidence which signaled to a rise in world hunger.[91] In this respect, according to the available data to this end, the number of people who suffer from hunger has grown such that it is returning to levels from a decade ago.[92] Specifically, in this regard, the absolute number of people in the world affected by undernourishment[93], or chronic food deprivation, is currently estimated to have increased from around 804 million in 2016 to nearly 821 million in 2017.[94] The study has attributed climate variability and extremes as being the key drivers behind this rise in global hunger and one of the leading causes of severe food crises.[95] Thus, these findings highlight the fact that there are different underlying factors behind the current peak even though the effects of each occurrence is most widespread.

Mindful of this call for caution, this chapter seeks to zoom into the right to food as enshrined in international human right documents. In doing so, it will overview its historical and legal basis mainly under the Universal Declaration on Human Rights (hereafter UDHR) (Article

[88] FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2017. Building Resilience for Peace and Food Security, (Rome, FAO: 2017).

[89] Ibid. In this regard, the study has especially noted that the food security situation has worsened in parts of sub-Saharan Africa and South-Eastern and Western Asia. Moreover, evidence on various forms of malnutrition points to continued decreases in the prevalence of child stunting. Notwithstanding this however, stunting still continues to affect one in four children under the age of five years. Parallel to this, overweight among children under five is becoming more of a problem and adult obesity continues to rise in all regions.

[90] Ibid.

[91] Ibid. FAO, IFAD, UNICEF, WFP and WHO. The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition, (Rome, FAO: 2018).

[92] Ibid.

[93] Ibid. The study has divulged that factors that has exacerbated undernurtition include poor access to food and particularly healthy food, higher cost of nutritious foods, the stress of living with food insecurity and physiological adaptations to food restriction.

[94] Ibid. The situation is worsening mainly in South America and most regions of Africa whereas the decreasing trend in undernourishment that characterized Asia until recently seems to be slowing down significantly. The study has moreover noted that a limited progress, in magnitude and pace, has been made in reducing child stunting and increasing exclusive breastfeeding during this period. Nonetheless, while the prevalence of overweight in children under five years may not have changed significantly, adult obesity continues to rise and one in three women of reproductive age in the world is anaemic.

[95] Ibid.

25(1))[96] and the International Covenant on Economic, Social and Cultural Rights (hereinafter ICESCR) (Article 11).[97] In this respect, reference will also be made to other human rights instruments that give recognition to the right to food. In recognition of the multifaceted global efforts that played a major role in terms of galvanizing the international consensus on the right to adequate food, the following section will highlight the major endeavors in this respect. Building on this, the subsequent discussion will examine in detail General Comment 12 under which the Committee on Economic, Social and Cultural Rights (hereinafter, CESCR) has provided its authoritative interpretation to Article 11 of the ICESCR. This will be followed by a discussion of the second focal point of analysis for this research, related to the right of everyone to enjoy the benefits arising out of scientific progress (hereinafter, the right to science) as enshrined in international human rights documents, notably the UDHR (Article 27(1))[98] and ICESCR (Article 15(1) (b)).[99]

[96] United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III: Article 25(1).
[97] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.: Article 11.
[98] United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III: Article 27(1).
[99] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.: Article 15(1) (b).

2.2. International Bill of Human Rights: Evolution and Legal Foundations

The baseline for the development of contemporary human rights dates back to the Second World War.[100] In the State of the Union delivered by President Franklin Delano Roosevelt on January 6, 1941[101], the foundations were laid out for the outlook of the world after the period of hostilities and rivalry had come to an end. In his Four Freedoms address delivered to Congress, the U.S. President called for the preparedness of war while avowing that "In the future days, which we seek to make secure, we look forward to a world founded upon four essential human freedoms...".[102] Accordingly, the Four Freedoms upon which the world was to be based on comprised of four essential human freedoms; freedom of speech and expression, freedom of every person to worship God in his/her own way everywhere in the world, freedom from want which referred to the "economic understandings which will secure to every nation a healthy peacetime life for its inhabitants"[103], and freedom from fear which pointed to a global reduction of armaments "...to a point and in such a thorough fashion that no nation will be in a position to commit an act of physical aggression against any neighbor".[104] In 1944, three years after he had presented his Four Freedoms address, President Roosevelt forwarded to Congress his Economic Bill of Rights[105] wherein the Right to Food was for the first time mentioned.[106] In this light, the Economic Bill of Rights made reference to “the right of every farmer to raise and sell his products at a return which will give him and his family a decent living".[107]

While this was taking place, the dismay of the mid 20th Century, inflicted by Nazi Germany, necessitated the international community to formulate a new kind of policy to guide the world.[108] As a result, by giving priority to human rights, the international community began to speak out in one voice in support of human rights. The culmination of this effort has led to the establishment of a global organization, the United Nations (hereinafter, UN), shortly after the end of WWII on 24 October 1945.[109] Hence, as an upshot of the vested interest put in place, the UN[110] was established, along with its Charter[111], as adopted in 1945 wherein States agreed to "...save succeeding generations from the scourge of war...and to reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights

[100] Otto Hospes & Irene Hadiprayitno, eds., Governing Food Security: Law, politics and the Right to Food, (Wageningen Academic Publishers, The Netherlands: 2010): 83-84.
[101] Franklin D. Roosevelt, The Annual Message to Congress January 6, 1941, in 9 Public Papers and Address of Franklin D. Roosevelt, (S. Rosenman ed.,1941): 672.
[102] Ibid.
[103] Ibid.
[104] Ibid.
[105] Speech to Congress (State of the Union Message). Cong. Rec 1944, January 11 1944.
[106] In the Economic Bills of Rights reference was made to the right adequate food for the first time. The Bill provided that, as one of the basis for the establishment of security and prosperity for all included, the right to earn enough to provide adequate food and clothing and recreation", Speech to the Congress (State of the Union Message) January 11 1944, Cong. Rec 1944.
[107] Speech to Congress (State of the Union Message) January 11 1944, Cong. Rec 1944.
[108] Kent, Freedom from Want, 41.
[109] Hospes & Hadiprayitno, eds., Governing Food Security, 83-84.
[110] The United Nations was established with the core objective of maintaining global peace and security.
[111] United Nations, Charter of the United Nations, October 24 1945, 1 UNTS XVI.

of men and women and of nations large and small..."[112], and to achieve "...universal respect for, and observance of, human rights and fundamental freedoms for all without distinction as to race, sex, language or religion".[113] By serving as the Constitution of the UN, the different organs of the Organization were established thereafter with primary bodies comprising of the General Assembly, the Security Council and the Economic and Social Council.[114] The UN Charter moreover has provided the procedure that would enable these bodies to establish secondary bodies.[115] Making use of the flexibility rendered to it, the Economic and Social Council established, at its first meeting, the Commission on Human Rights to enable it to fulfill its tasks properly.[116] Following this, the Commission on Human Rights dedicated three years of its existence writing the UDHR which was accepted with no dissenting vote by the General Assembly on December 10, 1948.[117] Hence, the foundation for the post-WWII human right movement was laid down with the adoption by the United Nations General Assembly (hereinafter, UNGA) of the UDHR[118].

Even though the original intention at the time sought to create, a global human rights system that consisted of, "...a declaration, a binding treaty and a monitoring/accountability mechanism", competing opinions[119], between Eastern and Western countries as well as developing and developed countries necessitated the drawing up of two Covenants, the International Covenant on Civil and Political Rights (hereinafter, ICCPR)[120] including its two protocols and the ICESCR.[121] Hence, with the adoption of the two International Bills of Human Rights, the principles as enshrined in the UDHR were given binding legal effects.[122] In this regard, the first Optional Protocol to the ICCPR[123] vowed to allow the Human Rights Committee (the UN treaty body overseeing implementation of that covenant) to receive complaints from individuals while the second protocol, aimed at the abolition of the death

[112] United Nations, Charter of the United Nations, 24 October 1945, 1UNTS XVI.
[113] Ibid.
[114] Ibid.
[115] Ibid.
[116] Economic and Social Council Resolution 5 (I), 16 February 1946., The decision for the establishment of the body was Based in relation Article 68 UN Charter that states, "The Economic and Social Council shall set up commissions in economic and social fields and for the promotion of human rights, and such other commissions as may be required fo/r the performance of its functions".
[117] Universal Declaration of Human Rights, G.A- Res. 217(111), U.N. Doc. Al RES/217, (1948)., The Declaration was adopted by then 58 members of the UN with 48 countries voting in favor, none against while receiving 8 abstentions. The countries that had abstained were, Saudi Arabia, South Africa, Soviet Union and three of its allies.
[118] Even though President Roosevelt had died earlier, 12 April 1945, and as such did not live to see his vision come true, his legacy was continued by his widow Anna Eleanor Roosevelt who played an important role by chairing the UN commission that drew up the Universal Declaration of Human Rights. See also, Hospes & Hadiprayitno, eds., "Governing Food Security, 83-84. Universal Declaration of Human Rights, G.A- Res. 217(111), U.N. Doc. Al RES/217, (1948); Kent, Freedom from Want, 41.
[119] Manisuli Ssenyonjo, Economic, Social and Cultural Rights in International Law, (Hart Publishing, Portland: 2009): Chapter one, Section II, Section 1.13 and 1.16, Section IV, Section 1.48-1.49.
[120] United Nations General Assembly, International Covenant on Civil and Political Rights, December 16 1966, United Nations Treaty Series, Vol. 999, P. 171.
[121] Ibid, 171.
[122] Kent, Freedom from Want; Wernaart, The Enforcebility of the Human Right to Adequate Food, 55-56.
[123] United Nations General Assembly, Optional Protocol to the International Covenant on Civil and Political Rights, December 19, 1996, United Nations Treaty Series, vol. 999, p. 171.

penalty[124] as adopted by the UNGA on December 15, 1989, and came into force on July 11, 1991. Hence, the post-WWII era has geared the international effort toward the development of individual human rights while urging Governments to extend protection over them.[125] With the above international developments that gave recognition to human rights in mind, the section below will explore the legal basis of the right to food in this international legal regime.

[124] United Nations General Assembly, Second Optional Protocol to the International Covenant on Civil and Political Rights, Aiming at the Abolition of the Death Penalty, December 15, 1989, A/RES/44/128.
[125] Ying Chen, Trade, Food Security, and Human Rights the Rules for International Trade in Agricultural Products and the Evolving World Food Crisis, (Ashgate, England: 2014): 16.

2.2.1. Universal Declaration of Human Rights

As already alluded, the UDHR[126] was adopted on 10th December 1948 by the UNGA. It was adopted in Paris, at the Palais de Chaillot, as resolution 217 of the General Assembly, to be a common standard of achievements for all peoples and all nations.[127] The UDHR[128] was adopted with the core function of providing specification and explanation to the human rights content of the above noted UN Charter as enumerated under Article 55.[129] The UDHR is momentous due to the fact that, for the first time, it has sent out fundamental human rights to be universally protected.[130] This is because the adoption of the Declaration gave substance to the imprecise understanding of human rights and fundamental freedoms by providing a list of rights as well as freedoms generally considered as fundamental for the preservation on human freedoms and dignity.[131] Moreover, the great contribution of the UDHR lied in the fact that the Protocol has extended the human rights platform to be cognizant of broad fields, *inter alia*, civil, political, economic, social and cultural, by displaying these rights as interrelated, as such, making them mutually reinforcing.[132]

Notwithstanding this monumental achievement, the Protocol was short in creating new and binding obligations on the Signatories. This was due to the fact that efforts were put to deprive the Declaration's legal and compulsory attribute.[133] The move to snatch the UDHR off any legal obligation was driven by the fact that the UDHR was only intended to serve the first step towards an International Bill of Human Rights.[134] In this respect, the vision for the adoption of a binding treaty on human rights with legal effect was expected to be the second stage.[135] Nevertheless, this vision was soon taunted by the Cold War rivalries within the UN

[126] Universal Declaration of Human Rights, G.A- Res. 217(111), U.N. Doc. Al RES/217, (1948); Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999), "Freedom from want was one of the four fundamental freedoms referred to by United States President, Franklin D. Roosevelt, in his famous “four freedoms” address in 1941, which sparked the preparation of the Charter of the United Nations and later the Universal Declaration of Human Rights".

[127] Universal Declaration of Human Rights, G.A- Res. 217(111), U.N. Doc. Al RES/217, (1948): Preamble; Alston, "International Law and the Human Right to Food". Some States have used this consideration to contend that the UDHR is not part of international law.

[128] The U.S. delegation played a major role in the negotiations for the UDHR between 1947-1948. The U.S. emphasized that economic and social rights should be an integral part along with civil and political rights that set out the fundamental freedoms, because, in the words of the United States delegation, "a man in need is not a free man"., Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999).

[129] United Nations, Charter of the United Nations, October 24 1945, 1 UNTS XVI: Article 55, Donald E. Buckingham, "A Recipe for Change: Towards an Integrated Approach to Food under International Law", 6 Pace Int'l L. Rev. 285 (1994); Alston, "International Law and the Human Right to Food".

[130] Hospes & Hadiprayitno, eds., Governing Food Security, 83-86

[131] Ibid.

[132] Food and Agriculture organization (hereafter FAO), The Right to Food in Theory and Practice, (Rome, FAO 1998).

[133] Hospes & Hadiprayitno, eds., Governing Food Security, 83-86; Moskowitz, M., Human Rights and World Order. The Struggle for Human Rights in the United Nations, (Oceana Publication, New York: 1958):25.

[134] Hospes & Hadiprayitno, eds., Governing Food Security, 83-86.

[135] Ibid.

forcing the Organization to delegate this role to regional organizations like the Council of Europe.[136]

It can hence be argued that in spite of the interdependence and indivisibility of human rights,[137] as was also the intent of the UDHR, ensuing disagreement towards this end had galvanized the division of human rights into two categories.[138] In this regard, while States that were part of the Soviet bloc promoted one human right instrument, the views of States like the U.S. (and other developed countries) prevailed in that on December 16, 1966, two separate treaties (ICESCR[139] and ICCPR[140]) were adopted and opened for signature. The UDHR along with the two Covenants and the two protocols[141] are commonly recognized as the International Bill of Human Rights.[142] Having explored the general background of the UDHR, the remaining section will explore how the right to adequate food has been integrated into the document.

The main focus of this research, the right to food, is covered under Article 25(1) of the Declaration as a "...right to a standard of living".[143] In this respect, the provision specifically states that everyone has a right to "a standard of living adequate for the health and well-being of himself and of his family, **including food**, clothing, housing, and medical care and necessary social services... "[144] (emphasis added). A thorough reading of this enunciation of an adequate standard of living in Article 25(1) of UDHR signifies that the provision encompasses other Economic and Social rights besides the right to adequate food. More specifically, the provision encompasses, firstly, those rights that constitute the primary needs of human beings such as food, clothing, housing, medical care, and necessary social services while secondly, it incorporates secondary needs such as the right to security in the event of unemployment, sickness, disability, widowhood, old age, and other lacks of livelihood.[145]

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[136] In the Council of Europe which aims to promote human rights, democracy and the rule of law in Europe, human rights have progressed. This is in the light of the fact that two years after the UDHR was adopted, November 4, 1949, the Council of Europe adopted the European Convention on the Human Rights and Fundamental Freedoms/ the Treaty of Rome (ECHR). As such, the seed that was sown by the UDHR with regard to human rights and fundamental freedoms was continued by the Council of Europe culminating in the establishment of European Court of Human Rights and the adoption of the European Social Charter (ESC)., See, Hospes & Hadiprayitno, eds., Governing Food Security, 83-84; Council of Europe, European Social Charter, October 18 1961, ETS 35.

[137] See, Vienna Declaration and Programme of Action, World Conference on Human Rights, A/CONF157/24, (Vienna,1993): I(5).

[138] Hospes & Hadiprayitno, eds., Governing Food Security, 91-92.

[139] The United Nations General Assembly. 1966. "International Covenant on Economic, Social, and Cultural Rights." Treaty Series 999 (December): 171.

[140] Ibid; Hospes & Hadiprayitno, eds., Governing Food Security, 91-92.

[141] United Nations General Assembly, Optional Protocol to the International Covenant on Civil and Political Rights, December 19, 1996, United Nations Treaty Series, vol. 999, p. 171. United Nations General Assembly, Second Optional Protocol to the International Covenant on Civil and Political Rights, Aiming at the Abolition of the Death Penalty, December 15, 1989, A/RES/44/128.

[142] Kent, Freedom from Want.

[143] United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III): Article 25(1).

[144] Ibid.

[145] See, Adam Rehof, Asbjorn Eide, et al., "The Universal Declaration of Human Rights: A Commentary", 389 (1993).

Thus, according to scholars such as Alston[146], this articulation surpasses the mere right to be free from hunger in that "the amount of food to which every human being has a right is that which is adequate for his health and well-being and not merely for his bare survival". Therefore, the articulation in this provision also connotes that everyone has a right to a sufficient amount of food that is necessary and adequate for his/her wellbeing and health.[147]

At this junction, it will be important to examine the legal status of the UDHR. This is because considering that the UDHR is a resolution of the UNGA, as noted above, it is evident that questions may be raised as to the status of the Declaration, such as whether the right to an adequate standard of living including food, is part of customary international law? This endeavor is important because there are varying opinions to this question. For instance, some scholars are of the opinion that as a resolution of the UN, the Declaration is devoid of any binding legal effect[148]; whereas other scholars look at it as a set of rules of customary international law because it presents an authoritative expansion and interpretation of the UN Charter provisions.[149] More specifically, they raise the argument that States have frequently invoked the UDHR to back up their arguments before the UNGA.[150]

Hence, this signifies that the UDHR is an expansion and authoritative interpretation of the UN Charter which is legally binding on all States.[151] Consequently, the UDHR, as its direct expansion and its authoritative interpretation, "should enjoy a primary status in international law and bind all the Member States".[152] Therefore, even though as a resolution of the UNGA the Declaration does not have a binding legal effect[153], it can be attested that "...the Declaration is an authoritative interpretation specifically of the UN Charter Articles 1(3)[154], 55[155] and 56[156] and is indicative of State practice among UN member states".[157] As such, by

[146] Alston, "International Law and the Human Right to Food".
[147] Ibid.
[148] For example, one dissenting voice forwarded during the negotiation process was Sir Hersch Lauterpacht who, in a book he published afterwards questioned the very moral quthority of the declaration.; Hersch Lauterpacht , International law and Human Rights, (New York : Garland Publications., 1973).
[149] Alston, "International Law and the Human Right to Food".
[150] J.P. Humphrey, "The Universal Declaration of Human Rights: Its History, Impact and Juridical Character", in Human Rights: Thirty Years After the Universal Declaration, (B.G. Ramcharan ed., 1979) (Springer, Netherlands: 1979).
[151] United Nations, Charter of the United Nations, October 24 1945, 1 UNTS XVI.
[152] Chen, Trade, Food Security, and Human Rights the Rules for International Trade in Agricultural Products and the Evolving World Food Crisis, 23-29.
[153] The UDHR was not intended to have a binding legal effect because ratification of the Declaration was not made a compulsory requirement when the Declaration was proclaimed. See, Hannah A. Saona, "The Protection of Reproductive Rights under International Law: The Bush Administration's Policy Shift and China's Family Planning Practices", 13 Pac. Rim L. & Pol'y J. 229 (2004).
[154] The provision states that one of the purposes of the United Nations is, "To achieve international cooperation in solving international problems of an economic, social, cultural, or humanitarian character, and in promoting and encouraging respect for human rights and for fundamental freedoms for all without distinction as to race, sex, language, or religion". See, United Nations, Charter of the United Nations, 24october 1945, 1UNTS XVI., Article 1(3).
[155] The provision provides that, with a view to the creation of conditions of stability and well-being which are necessary for peaceful and friendly relations among nations..., a. the United Nations shall promote, higher standards of living...; b. solutions of international economic, social, health, and related problems; and international cultural and educational cooperation; and c. universal respect for, and observance of, human rights and fundamental freedoms for all without distinction as to race, sex, language, or religion. See ,United Nations, Charter of the United Nations, 24october 1945, 1UNTS XVI., Article 55.

being indicative of State practice and a continuous reference to the Declaration by States as though it has a binding legal effect, attributing to the general acceptance of the UDHR and the State's intent to act in conformity with it ('*opinio juris*')[158], "...at least the minimum content of the right to food - freedom from hunger - may now be considered to be part of customary international law".[159] As such, the right to food has been made an integral part of international human rights law through its incorporation in the UDHR as one of the necessities required for an adequate standard of living.

[156] Article 56 provides that, "All Members pledge themselves to take joint and separate action in cooperation with the Organization for the achievement of the purposes set forth in Article 55"., United Nations, Charter of the United Nations, 24 October 1945, 1UNTS XVI, Article 56.

[157] Donald E. Buckingham, "A Recipe for Change: Towards an Integrated Approach to Food under International Law", 6 Pace Int'l L. Rev. 285 (1994):10-11.

[158] In order to be a rule of customary international law, two elements have to be fulfilled. Firstly, the practice must have a general, constant, and uniform employment by States while on a secondary basis, it must be proven that it is established with binding effects in practice; accepted as law/opinio juris). As such, the acceptance of a general practice as law is known as "opinio juris". For more, see, Vaughan Lowe, International Law 37 (Oxford University Press, Oxford: 2007).

[159] Buckingham, "A Recipe for Change," 10-11.

2.2.2 The International Covenant on Economic Social and Cultural Rights

As illustrated above, the UDHR was not meant to have legal effect on the Signatory States because ratification of the Declaration was not made a compulsory requirement.[160] In addition to this, the UDHR was expected to be the first step towards an International Bill of Human Rights.[161] Hence, with a view to giving legal effect to the principles enshrined therein, as noted, the ICESCR[162] and the ICCPR[163] were adopted on December 16, 1966. This said, as the subject matter of the right under consideration here, the right to adequate food, is directly and precisely dealt within the ICESCR, the discussion below will uncover how it has been approached in the Covenant.

In the ICESCR[164], which came into force in 1976[165], the right to adequate food is presented under Article 11(1) and (2) of the Covenant. In this regard, while Article 11(1) of the provision covers the right of everyone to "...an adequate standard of living for himself and his family, including adequate food, clothing, and housing..."[166], sub-Article 2, provides "...the fundamental right of everyone to be free from hunger...".[167] Hence, the ICESCR, by virtue of the binding obligations it puts on States that are parties to it, the enunciation of the right of everyone to an adequate standard of living,[168] including adequate food presents an obligatory and enforceable human right obligation.[169] Specifically, in this regard, sub-Articles 2(a) and (b) of Article 11 provide enforcement obligations incumbent on the State Parties.[170] In the light of this, the Covenant provides that States Parties in recognition of the fundamental right of everyone to be free from hunger, "...shall take, individually and through international co-operation, the measures, including specific programmes...", as are needed to improve methods of production, conservation and distribution of food by employing fully, "...technical and

[160] Saona, "The Protection of Reproductive Rights under International Law".
[161] FAO, The Right to Food in Theory and Practice, (Rome, FAO 1998). This was because the UDHR was initially an expression of ideal goals to be achieved. The process of transforming these ideals into hard law at the international level started with the adoption of the two Covenants, ICESCR and ICCPR in 1966. See also, Hospes & Hadiprayitno, eds., "Governing Food Security", 83-86.
[162] The United Nations General Assembly. 1966. "International Covenant on Economic, Social, and Cultural Rights." Treaty Series 999 (December): 171.
[163] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.
[164] United nations General Assembly, International Covenant on Economic, Social and Cultural Rights, 16 December 1966, in force, 3 January, 1976, U.N, United Nations, Treaty Series, vol. 993. In 1985, the Committee on Economic, Social and Cultural Rights was established so as to monitor the implementation of the ICESCR. In 2008, the Optional Protocol to the ICESCR was adopted with the aim to strengthen the monitoring system, The Optional Protocol has provided the procedure for individual communications, inter-state communications as well as an inquiry procedure.
[165] As of September 2018, the ICESCR has 168 Signatories, See, United Nations Treaty Collection, Accessed on 01/02/2019, Available at, https://treaties.un.org/pages/ViewDetails.aspx?src=IND&mtdsg_no=IV-3&chapter=4&lang=en, Accessed on 22/01/2019
[166] United Nations General Assembly, International Covenant on Economic, Social and Cultural Rights, 16 December 1966, in force, 3 January, 1976, U.N, United Nations, Treaty Series, vol. 993.: Article 11(1).
[167] Ibid, Article 11(2).
[168] "The right to an adequate standard of living sums up the underlying concern of all economic and social rights, which is to integrate everyone into a humane society", The Right to Food in Theory and Practice, (Rome, FAO 1998).
[169] Kent, Freedom from Want.
[170] See, United Nations General Assembly, International Covenant on Economic, Social and Cultural Rights, 16 December 1966, in force, 3 January, 1976, U.N, United Nations, Treaty Series, vol. 993.: Article 11(2) (a) (b).

scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems...", in order to achieve the efficient development and utilization of natural resources.[171] Furthermore, the State Parties are to take into consideration the problems of food importing and exporting countries with a view "...to ensure an equitable distribution of world food supplies in relation to need".[172] Therefore, the incorporation of the right to adequate food under the ICESCR presents the first time wherein the provision was enunciated as a global legal right with enforceable obligations.[173] By virtue of the obligatory duties it puts on the Member States, the ICESCR requires the State Parties to submit regular reports to the CESCR, with the view to explain the measures they have undertaken and the progress they have made towards fulfilling their obligations under the ICESCR.[174]

Here, it will be vital to explore the negotiating history of the ICESCR especially in relation to Article 11 and its two sub-Articles. When glancing at the negotiating history, the incorporation of sub-Article 2, dealing with the fundamental right of everyone to be free from hunger, was done in tandem with the FAO which sought to get a legal shelter for its Freedom From Hunger campaign in the 1960s.[175] This said, the negotiation history on Article 11 reveals that the contents of the provision were the subject of intense debate.[176] As a case in point, for instance, this was the case with the Dutch delegation that asserted, the provision was "too detailed, covered issues that went beyond the competence granted to the Third Committee[177] and that it was not consistent with the bald statements relating to the rights of housing and clothing".[178] For this reason, the delegation proposed that the provision will be more fitting as a declaration instead of a legally-binding instrument.[179] Hence, according to the Dutch delegation, problems related to food are to be addressed through a diverse approach than the too specific formulation under Article 11 of the ICESCR.[180] Therefore, a birds-eye

[171] Ibid.
[172] Ibid.
[173] Wernaart, The Enforceability of the Human Right to Adequate Food.
[174] For more, see, Kitty Arambulo, "Drafting an Optional Protocol to the International Covenant on Economic, Social and Cultural Rights: Can an Ideal Become Reality", 2 U.C. Davis J. Int'l L. & Pol'y 111, 122 (1996).
[175] The Freedom from Hunger Campaign (FFHC), was an information/education initiative that was designed to raise awareness of the problem of hunger and malnutrition. The FFHC was conceived by the FAO Director General BR Sen with the aim of raising awareness to the problem of hunger and malnutrition as well as providing possible solutions to the problem., See, FAO, Freedom from Hunger Project, Available at, https://freedomfromhungerproject.weebly.com/, Accessed on, 13/03/2019. Alston, "International Law and the Human Right to Food".
[176] Wernaart, The Enforceability of the Human Right to Adequate Food.
[177] As one of the six Committees subdivided by themes that the General Assembly has established to manage its numerous tasks, most of the resolutions and conventions adopted by the United Nations General Assembly are negotiated by the Third Committee, the Committee for Social, Humanitarian and Cultural Affairs Committee (SOCHUM).The Third Committee is in session simultaneously with the General Assembly and accepts reports from Special Rapporteurs, Special Representatives, Working Groups and other Special Procedures as well as from the Human Rights Council. In this regard, contracting States can apply themselves as «sponsors» to certain topics that are debated by the Commission. The Third Committee may draft resolutions which will then be presented to the General Assembly for adoption., General Assembly/Third Committee, Available at, https://www.humanrights.ch/en/standards/un-institutions/ga/, Accessed on 08/02/2019.
[178] Ben Saul, General Assembly, Eighteenth Session, Third Committee, Agenda Item 48, Draft International Covenants on Human Rights, 1267th Meeting, A/C.3/SR.1267 (18 November 1963):57-63.
[179] Ibid.
[180] Wernaart, The Enforceability of the Human Right to Adequate Food.

view into the negotiating history reveals that the provision was a result of a compromise between countries that favored a stronger formulation and a binding commitment on one side, and others that wanted to preserve a margin of discretion in ways as suitable to meet their specific demands/needs, on the other.[181] Finally, the right to food has been incorporated in the ICESCR as a right to a standard of life including adequate food and the fundamental right to be free from hunger.

The exposition of "the right to adequate food" both under Article 25(1) of the UDHR, as noted, and Article 11(1) and (2) of the ICESCR has been approached to have broader meaning by experts.[182] For instance, it has been interpreted as a "shorthand expression encompassing two separated norms" under Articles 11(1) dealing with the right to an adequate standard of living and sub-Article (2) relating to the fundamental right to be free from hunger.[183] Another approach taken asserts that the right to food has both a “relative” and “absolute” meanings in that, the fundamental right of everyone to be free from hunger takes the “absolute international minimum standard”.[184] As will be highlighted later, this point was also reaffirmed by the CESCR in its General Comment on Article 11 to the ICESCR.[185] The right to adequate food is approached as encompassing a “relative” standard for the fact that it cannot be considered as an international minimum standard.[186] Notwithstanding the difference of opinion, however, the right to food in its basic formulation relates to the "fundamental right of everyone to be free from hunger".[187] In this vein, the CESCR, as will be explored further in subsequent sections, has provided that, as a minimum core obligation[188] they have assumed under the ICESCR, the State Parties to the Covenant must act immediately "to mitigate and alleviate hunger...even in times of natural or other disasters".[189]

Similar to the UDHR, the articulation of the right to an adequate standard of living, including adequate food, under Article 11 (1), comprises of various rights that are considered essential for the right to an adequate standard of living.[190] For instance, the provision articulates that, the States Parties to the Covenant recognize the right of everyone to an adequate standard of living, "....including adequate food, clothing, and housing, and to the continuous improvement

[181] Ibid.
[182] Buckingham, "A Recipe for Change".
[183] Alston, "International Law and the Human Right to Food".
[184] Ibid.
[185] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12: The Right to Adequate Food (Art. 11)," Adopted at the Twentieth Session of the Committee on Economic, Social and Cultural Rights, E/C.12/1999/5, (12 May 1999).
[186] Katarina Tomasevski ed., The Right to Food: Guide Though Applicable International Law, (Martinus Nijhoff Publishers, The Netherlands: 1987).
[187] See, United nations General Assembly, International Covenant on Economic, Social and Cultural Rights, 16 December 1966, in force, 3 January, 1976, U.N, United Nations, Treaty Series, vol. 993.: Article 11(2).
[188] For more on this, see, Katharine Young, “The Minimum Core of Economic and Social Rights: A Concept in Search of Content”, Yale Journal of International Law, Vol. 33, No. 1, (2008).
[189] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12: The Right to Adequate Food (Art. 11)," Adopted at the Twentieth Session of the Committee on Economic, Social and Cultural Rights, E/C.12/1999/5, (12 May 1999): Paragraph 6.
[190] Kent, Freedom from Want.

of living conditions".[191] As such, the inclusion of the right to adequate food in the provision, alongside adequate health, education, and other requirements as addressed in other parts of the Covenant and other human rights instruments, *inter alia*, health, education, housing, conveys the fact that an adequate standard of living has a broader meaning than the sole preoccupation with the right to adequate food.[192] Therefore, this indicates that there is not to be prioritization among different human rights.[193] This is because these rights are mutually reinforcing in that they feed into one another. For instance, better nutrition, health, and education (economic and social rights) are imperative for the continued improvements in living conditions in general, and the assurance of civil and political freedoms and the rule of law.[194] On the flip side, freedom of expression and association (civil and political rights) are needed for ensuring that the best decisions are taken to protect not only the rights to food but also health and education.[195] This approach which vows to acknowledge the interdependence, indivisibility and interrelation contradict the previous narrow understanding of human rights.[196] This is because, this understanding is centered around the 'full belly thesis'[197] under which the subsistence rights to food as well as that of water were to be secured before proceeding to the insurance of civil and political rights such as, "political participation, arbitrary, detention, freedom of expression, or privacy".[198] Therefore, the right to adequate food has a broader meaning because, according to Asbjorn Eide[199], the right to adequate food is a necessary but not a sufficient component of the right to adequate nutrition. This is so because the realization of adequate nutrition requires parallel achievements, "...in the fields of health, care for the vulnerable, and education". Thus, the right to adequate food constitutes only one dimension for the right to an adequate livelihood.[200]

Moreover, the stipulation of the right to be free from hunger as connoted under Article 11(2), as will be explored subsequently, has been approached as implying two interrelated concepts;

[191] See, United nations General Assembly, International Covenant on Economic, Social and Cultural Rights, 16 December 1966, in force, 3 January, 1976, U.N, United Nations, Treaty Series, vol. 993: Article 11(1).
[192] Paul Hunt, "State Obligations, Indicators, Benchmarks, and the Right to Education", Human Rights Law and Practice, No. 4 (1998): 109–115; Rajni Kothari, "Globalization in a World Adrift, Alternatives", 22, No. 2, (1997). 227–268; Virginia Leary, "The Right to Health in International Human Rights Law, Health and Human Rights" 1, No. 1, (1994).
[193] Andrew Clapham, Human rights: A very short introduction, (Oxford University Press, Oxford, UK, 2007).
[194] Ibid; The Right to Food: Guide on Legislating on the Right to Food, (Rome, FAO, 2009).
[195] Clapham, Human rights: A very short introduction; The Right to Food: Guide on Legislating on the Right to Food, (Rome, FAO, 2009).
[196] This is because many Governments today adhere to fact that there should not be any prioritization between human rights even though questions as regards the modality of their enforcement as well as scope still linger, Clapham, Human rights: A very short introduction.
[197] Rohda Howard, "The Full-Belly Thesis: Should Economic Rights Take Priority over Civil and Political Rights? Evidence from Sub-Saharan Africa", *Human Rights Quarterly, John Hopkins University Press*, (1983).
[198] Clapham, Human rights: A very short introduction.
[199] Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 281999): 9- 10
[200] Asbjourn Eide, "The right to an adequate standard of living including the right to food", In Economic, Social and Cultural Rights: A textbook, 2nd ed., (Asbjørn Eide, Catarina Krause, and Allan Rosas), (Martinus Nijho*f*, Dordrecht, The Netherlands: 2001).

the absence of malnutrition and that of hunger.[201] In this regard, malnutrition implies the lack of an adequate quality of diet such that a person cannot have access to a well balanced diet which is needed to live a healthy life.[202] The second element, hunger, referring to undernourishment or undernutrition, connotes a lack of adequate quantity of food meaning that a person cannot access the necessary calories for an adequate diet.[203] Thus, as this discussion has tried to explore, through its incorporation in Article 11 of the ICESCR, the right to food has been presented as an obligatory and enforceable human right obligation.

[201] See for instance, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2001/53, (February 7 2001); Ziegler, Golay, Mahonet al., The Fight for the Right to Food, Lessons Learned; Kent, Freedom from want.
[202] Ibid; Kent, Freedom from want.
[203] See for instance, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2001/53, (February 7 2001), Ziegler, Golay, Mahonet al., The Fight for the Right to Food, Lessons Learned; Kent, Freedom from want.

2.3. Additional Human Right Instruments that Give Due Recognition to the Right to Adequate Food

In the light of the fact that the articulation of the right to food in modern international human rights law arises as a part of the human right to an adequate standard of living, it is worth examining other international human rights instruments that give recognition to the right to adequate food. This is because, in addition to the afore explored human right laws, notably the UDHR and ICESCR, the right to food is also covered in other human rights instruments dealing with various points of focus, regional human right instruments, and non-binding instruments as produced notably by the FAO, the Human rights Commission (later, Human Right Council[204]), and the CESCR.[205] Therefore, discussion below will overview such human rights instruments that make reference to the right to adequate food.

To start from instruments which are binding, the ICCPR,[206] under Article 1(2) stresses that "In no case may a people be deprived of its own means of subsistence". Moreover, "...the inherent right to life" as enshrined under Article 6 of the ICCPR, conveys a similar understanding of the fact that the right to adequate food, among other necessities, is paramount for sustaining life.[207] In this light, the UN Human Rights Committee in its General Comment on the right to life[208] has stressed that this right should not be interpreted restrictively since the protection of the right requires the taking of positive measures by the States. Hence, in the General Comment it has provided,[209] the Committee gives a specific reference to the need for the elimination of malnutrition. The provision specifically expounds that States Parties to the Covenant are "...required to take positive steps to reduce infant mortality and to increase life expectancy, especially in adopting measures to eliminate malnutrition and epidemics".[210]

Another binding legal instrument is the Convention on the Right of the Child.[211] The Convention which came into force in 1990, addresses nutrition under two of its provisions. Under Article 24(1), the provision expounds that "The State Parties recognize that the right of the child to the enjoyment of the highest attainable standard of health", shall take appropriate measures “to combat disease and malnutrition . . . through the provision of adequate nutritious foods, clean drinking water, and health care”.[212] Similarly, Article 24, sub-Article 2(c) also provides that States Parties shall take appropriate measures “…to ensure that all segments of society, in particular parents and children, are informed, have access to education and are

[204] The Commission on Human Rights has been replaced by the Human Rights Council as of 2006 as established by UN General Assembly Resolution 60/251 of 15 March 2006.
[205] The Right to Food: Guide for Legislating on the Right to Food, (Rome, FAO 2009).
[206] United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.
[207] Kent, Freedom from Want, 48-49; The United Nations General Assembly. 1966. “International Covenant on Economic, Social, and Cultural Rights.” Treaty Series 999 (December): 171: Article 1(2) and 6.
[208] Human Rights Committee (HRC), "CCPR General Comment No. 6 (right to Life)", Adopted at the Sixteenth Session of the Human Rights, (April 30 1982): Paragraph 5.
[209] Ibid.
[210] Ibid.
[211] See, The United Nations General Assembly, 1989, "Convention on the Rights of the Child", Adopted 20 Nov. 1989, G.A. Res. 44/25, U.N. GAOR, 44th Sess.
[212] Ibid, Article 24.

supported in the use of basic knowledge of child health and nutrition and the advantages of breastfeeding".[213] Likewise, Article 27(3) provides that States Parties "...shall in case of need provide material assistance and support programmes, particularly with regard to nutrition, clothing, and housing".[214]

Furthermore, the Convention on Persons with Disabilities[215] also addresses the right to adequate food. This is because Article 28 repeats the essence to the ICESCR in that it highlights that the State Parties recognize the right of persons with disabilities to an adequate standard of living for themselves and their families, "...including adequate food, clothing and housing, and to the continuous improvement of living conditions...".[216] The Convention specifically makes reference to the right to food as an adequate standard of living in the context of the right to health.[217] Accordingly, under Article 28(1), the Convention grants recognition to the right to an adequate standard of living and social protection, including the right to adequate food.[218] Parallel to this, the provision moreover provides that the right to equal access to clean water, and the right to access to social protection and poverty reduction programmes.[219]

In addition to this, the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW)[220] discusses adequate nutrition in the context of pregnancy under Article 12(2). The provision specifically stipulates that the State Parties shall ensure the provision of appropriate services in the light of pregnancy by, "...granting free services where necessary, as well as adequate nutrition during pregnancy and lactation".[221]

A treaty-based articulation of the right to food is, moreover to be found in several articles of the Geneva Conventions and Protocols[222] dealing with humanitarian law in the context of

[213] Ibid, Article 24(2)(c).
[214] See, The United Nations General Assembly, 1989, "Convention on the Rights of the Child", Adopted 20 Nov. 1989, G.A. Res. 44/25, U.N. GAOR, 44th Sess.: Article 27(3)., In addition to these provisions that may directly be linked with the right to food, the Convention also contains articles that may be indirectly linked to the right to food, inter alia, non-discrimination provision in (Article 2), the principle of the best interests of the child under (Article 3), the right to life (Article 6 (1)), the right to humanitarian assistance for refugees (Article 22), special protection for mentally or physically disabled children (Article 23), and the right to social security (Article 26).
[215] The United Nations General Assembly, 1989, "Convention on the Rights of the Child", adopted 20 Nov. 1989, G.A. Res. 44/25, U.N. GAOR, 44th Sess: Article 28.
[216] Ibid.
[217] United Nations General Assembly, Convention on the Right of Persons with Disabilities, Resolution/Adopted by the General Assembly, adopted 24 January, 2007, A.RES/61/10: Article 25 and 28(1).,
[218] Ibid, Article 28(1).
[219] Ibid, Article 28(2)(a). In addition to this, in Article 25(f), in relation to the right to healthcare, reference is made the duty incumbent on state parties to "prevent discriminatory denial of health care services or food and fluids on the basis of disability" (Article 25 (f)). The provisions dealing with the right to life, the right to the enjoyment of the highest attainable standard of health under Article 10 and 25 indirectly give recognition to the right to food.
[220] United Nations General Assembly, Convention on the Elimination of All Forms of Discrimination Against Women, 18 December 1979, G.A. Res.,34/180, United Nations, Treaty Series, vol 1249.: Article 12(2), In view of the fact that one of the causes of malnutrition is the discrimination against women in favor of men, often considered the only breadwinners, the Convention vows to address these issues in several of its provisions, *inter alia*, Article 11(1)(e), 11 (1) (f), 14(2) (g) and 14(2) (h).
[221] Ibid, Article 12(2).
[222] Geneva Conventions and Protocols that give due recognition to the right to food include; International Committee of the Red Cross (ICRC), Geneva Convention for the Amelioration of the Condition of the Wounded

armed conflicts with the respective beneficiaries of the treaties, *inter alia*, prisoners of war, and civilians.[223]

Besides the incorporation of a provision dealing with the right to adequate food or allusion to it in the above discussed international legal human rights standards, numerous regional human rights instrument that give recognition to the right to adequate food have been put in place. Some of the regional human rights documents in this regard include, the African Charter on the Rights and Welfare of the Child (1990)[224] and the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa (2003),[225] the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, known as the Protocol of San Salvador (1988)[226], the Cairo Declaration on Human Rights in Islam[227], the European Charter of Fundamental Human Rights of the

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and Sick in Armed Forces in the Field (First Geneva Convention), 12 August 1949, 75 UNTS 31: Articles 32 (2) and Article 27; International Committee of the Red Cross (ICRC), Geneva Convention Relative to the Treatment of Prisoners of War (Third Geneva Convention), 12 August 1949, 75 UNTS 135: Articles 20, 26, 28, 46, 51 and 72; International Committee of the Red Cross (ICRC), Geneva Convention Relative to the Protection of Civilian Persons in Time of War (Fourth Geneva Convention), 12 August 1949, 75 UNTS 287: Articles 15, 23, 49, 50, 55, 59, 76, 87, 89, 100, 108 and 127; International Committee of the Red Cross (ICRC), Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977, 1125 UNTS 3: Articles 54, 69 and 70; International Committee of the Red Cross (ICRC), Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977, 1125 UNTS 609: Articles 5, 14, 18.

[223] Geneva Convention Relative to the Protection of Civilian Persons in Time of War (Fourth Geneva Convention), 12 August 1949, 75 UNTS 287; International Committee of the Red Cross (ICRC), Geneva Convention Relative to the Treatment of Prisoners of War (Third Geneva Convention), 12 August 1949, 75 UNTS 135.

[224] The African Charter on the Rights and Welfare of the Child gives recognition to the right of children to nutrition in Article 14 (2) (c), (d) and (h) in the context of the right to health and health services., Organization of the African Unity (OAU), African Charter on the Rights and Welfare of the Child, 11 July 1990, CAB/LEG/24.9.49 (1990).

[225] African Union, Protocol to the African Charter on Human and People's Rights on the Right of Women in Africa, 11 July, 2003., The Protocol deals with the right to food in Article 15 while under Article 14 (2) (b), it gives due recognition to the right of pregnant and breastfeeding women to nutrition. Moreover, the Organization of African Unity (OAU) adopted the African Charter on the Rights and Welfare of the Child that explicitly recognizes the right to adequate food in under Articles 14 and 20. Organization of African Unity (OAU), African Charter on the Rights and Welfare of Children, 11 July, 1990: Article 14 and 20. In addition to this, in 2009, the AU has adopted the African Union Convention for the Protection and Assistance of Internally Displaced Persons in Africa, Kampala Convention. In this convention the States Parties pledge themselves to provide internally displaced persons with adequate humanitarian assistance, including food and water. Moreover, members of armed groups are "...prohibited from denying internally displaced persons the right to live in satisfactory conditions of dignity, security, sanitation, food, water, health and shelter… See, African Union, African Union Convention for the protection and Assistance of Internally Displaced persons in Africa, ("Kampala Convention"), 23 October, 2009: Article 9(2)(b) and 7(5)(c).

[226] Organization of American States (OAS), Additional protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, ("Protocol of San Salvador"), 16 November, A-52. For instance, Article 12 of the Protocol of San Salvador recognizes the right to food. The article provides that, "Everyone has the right to adequate nutrition which guarantees the possibility of enjoying the highest level of physical, emotional and intellectual development". Moreover, under Article 17, the right is addressed in relation to the protection of the elderly.

[227] Organization of the Islamic Conference (OIC), Cairo Declaration on Human Rights in Islam, 5 August 1990. The Cairo declaration under Article 17(c) provides that "States shall ensure the right of the individual to a decent living that may enable him to meet his requirements and those of his dependents, including food, clothing, housing, education, medical care and all other basic needs".

European Union (EU) [228] and the Asian Human Rights Charter.[229] Therefore, even though the right to adequate food is not directly presented in these and similar instruments, such binding documents imply and reaffirm the right to adequate food.[230] The right to adequate food, therefore, serves as a "basic right" in that it serves as a vital avenue for the realization of other rights.[231]

As a nonbinding Declaration adopted by the UN, the Millennium Development Goals (hereinafter, MDGs)[232] as declared in 2000, likewise give due recognition to the right to be free from hunger as a universally accepted human right. Specifically, the MDGs flagship the objective of eradicating extreme poverty and hunger as the first pervasive goal for the development policy to be achieved by 2015.[233] Thus, as the main target set forth in the first goal of the MDGs, the first priority was given to the objective of eradicating extreme poverty and hunger.[234] To this end, Members of the UN vowed to reduce by half the proportion of people suffering from hunger in 2015.[235] As noted, the MDGs are political commitments made by the Member States as a result lacking a binding legal effect. However, to the extent that they have created a blueprint for poverty reduction and world development by 2015 and the full endorsement they have acquired from the Member States and world-leading development institutions, they have made an unprecedented effort towards meeting the needs of the world's poorest.[236]

Building on the MDGs, in September 2015, the General Assembly adopted the 2030 Agenda for Sustainable Development that includes 17 Sustainable Development Goals (hereafter, SDGs) that are to be achieved by 2030.[237] In this regard, the objective of addressing the challenges of hunger, food insecurity and malnutrition in all its forms has been made an integral part of the second SDG of the 2030 Agenda.[238] More specifically by 2030, Goal 2 of

[228] European Union, Charter of Fundamental Rights of the European Union, 26 October 2012, 2012/C 326/02: Article 34. Although a direct reference is not made to the right to food, several provisions of the European Social Charter (as revised in 1996)., may implicitly be connected to it. See for example, Council of Europe, European Social Charter, 18 October 1961, ETS 35: Article 3, 4(1), 7, 8, 12, 13, 14, 16 and 19.

[229] See, Regional Treaties, Agreements, Declaration and Related, Asian Human Right Charter, 17 May 1998: Article 7(1).

[230] Kent, Freedom from Want, 48-49.

[231] Henry Shue, Basic rights: Subsistence, Affluence, and U.S. Foreign Policy, 2nd ed, (Princeton University Press, Princeton, N.J.: 1996), See also, General Comment 12: Paragraph 4; Kent, Freedom from Want, 48-49.

[232] In response to the world's major development challenges, the Millennium Development Goals (MDGs) are eight proposed goals to be achieved by 2015. The eight Millennium Development Goals cover areas of income, health, education, gender, environmental sustainability, and governance. See, United Nations, The Millennium Development Goals Report 2013, 1July, 2013, ISBN 978-92-1-101284-2.

[233] See, United Nations, The Millennium Development Goals Report 2013, 1July, 2013, ISBN 978-92-1-101284-2.

[234] Ibid.

[235] The other objectives under Goal 1 relate to the commitment to reduce by half the proportion of people whose income is less than $1 a day, achieve full and productive employment and decent work for all, including women and young people.

[236] Chen, Trade, Good Security and Human Rights: The Rules in International Trade in Agricultural Products, and the Evolving World Food Crisis.

[237] UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, 21 October 2015, A/RES/70/1.: Goal 2.

[238] Ibid; The United Nations Sustainable Development Goals, Available at, https://sustainabledevelopment.un.org/?menu=1300, Accessed on, 22/03/2019.

the SDGs has pledged to end hunger and ensure access by all people, to safe, nutritious and sufficient food all year round.[239] Furthermore, the objective of ensuring sustainable food production systems and the implementation of resilient agricultural practices that increase productivity and help maintain ecosystems, has been given a central part under Goal 2 of the SDGs.[240] Thus, even though the SDGs lack a binding legal effect, they have provided "...a globally endorsed normative framework for development".[241]

Therefore, besides the above-discussed expositions in the UDHR and the ICESCR, the right to food has also been made an integral part of binding, regional and non-binding human rights instruments.

[239] UN General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development, 21 October 2015, A/RES/70/1.: Goal 2 (1).
[240] Ibid, Goal 2.
[241] Nilsson, Måns, David Griggs, et al., "A framework for understanding sustainable development goal interactions." A Guide to SDG Interactions: From Science to Implementation (2017).

3. The World Food Summit and the Rome Declaration

Building on the above explored momentous international efforts that gave recognition to human rights in general and the right to adequate food in particular, different international conferences, nonbinding resolutions and declarations contributed a considerable fair share in terms of galvanizing the international consensus on the right to adequate food. The discussion below will expound these international endeavors.

In 1974, the World Food Conference was held which culminated in the adoption of the Universal Declaration on the Eradication of Hunger and Malnutrition.[242] The declaration was endorsed by the UNGA in Resolution 3348 of December 17, 1974.[243] The declaration vowed to eradicate hunger, which was at the time considered a common responsibility of the international community, through the means of increased food production and the adequate sharing of resources.[244] It specifically asserted that "every man, woman, and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and maintain their physical and mental faculties".[245] The Conference was monumental for the fact that it has introduced the right to food as a priority in the international context.[246] Notwithstanding this urge to eradicate hunger through international cooperation, the World Food Conference has failed to meet its goals. The failure endured was a result of the lack of policy making as well as funding.[247]

Taking note of this, as part of the preparatory work undertaken for the World Food Summit (hereinafter, WFS) that was to be held in 1996, a meeting was convened in Caracas in July of the same year at the initiative of the President of Venezuela that focused on "The

[242] General Assembly Resolution, Universal Declaration on the Eradication of Hunger and Malnutrition, Adopted on November 16 1974 by the World Food Conference convened under General Assembly resolution A/RES/3180 (XXVIII) of 17 December 1973; endorsed by General Assembly resolution A/RES/3348 (XXIX) of 17 December 1974. As a prelude to this Declaration, on March 14, 1963, a Special Assembly on Man's Right to Freedom from Hunger met up in Rome where it issued a Manifesto that stipulated freedom from hunger as a fundamental right, albeit failing short of providing an elaboration on it. See, Krishnaswamy, S., ed., Man's Right to Freedom from Hunger: A Report of a Special Assembly, (Rome, Italy, FAO 14 March: 1963); Kent, Freedom from Want, 50-51.

[243] General Assembly Resolution, A/RES/3348 (XXIX), (December 17 1974).

[244] Universal declaration on the eradication of hunger and malnutrition, adopted on 16 November 1974 by the World Food Conference convened under General Assembly Resolution A/RES/3180 (XXVIII) of 17 December 1973 endorsed by General Assembly Resolution A/RES/3348 (XXIX) of 17 December 1974.

[245] As a response to the pertinent problems being experienced at the time, (due to peaks in population number and the recurrence of draught in major grain producing countries, as a consequence leading to price hikes, in this summit, food security was defined more specifically as the "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices". Universal Declaration on the Eradication of Hunger and Malnutrition, adopted on 16 November 1974 by the World Food Conference convened under General Assembly Resolution A/RES/3180 (XXVIII) of 17 December 1973; endorsed by General Assembly Resolution A/RES/3348 (XXIX) of 17 December 1974; Coline Sage, "Food Security", in Edward A. Page, Michael R., Redcliff (eds), Human Security and the Environment: International Comparisons (UK, Elgar, 2002): 128 -129.

[246] Anna Gonzalez, Human Rights and World Trade: Hunger in International Society, (Routledge, London and New York: 2005): 53: 77.

[247] FAO, 'World Food Summit', (Rome, FAO, 2002d):1. Available at, http://fao.org/wfs/main_en.htm. See also, Kent, Freedom from Want, 52-53. Cognizant of the shortfall, in 1984 the World Food Assembly, mainly comprised by representatives of nongovernmental organizations (NGOs), met in Rome. In a final statement that was adopted, the World Food Assembly asserted that millions of people are being denied the most basic human right; the right to food.

Fundamental Human Right to Food".[248] At its conclusion, the meeting adopted the Caracas statement which called for the development of a Code of Conduct with a view to clarifying the constituent elements of the right to adequate food and that which would provide guidance concerning its realization.[249] The statement was pertinent in terms of underscoring the right to food at the WFS.

Following this, the FAO organized the WFS in 1996.[250] The Summit brought together close to 10,000 participants drawn from Inter-Governmental Organizations (IGOs) and Non-Governmental Organizations (NGOs) that were from spheres that had helped to influence public opinion and provided a framework for bringing important changes in policies needed to achieve food for all.[251] Participants included representatives at the highest level, heads of state from 185 countries and the European Union.[252]

The Summit was completed with an agreement on two major documents, the Rome Declaration on World Food Security as adopted on November 13, 1996[253], and the World Food Summit Plan of Action.[254] The States that had attended the Summit affirmed, "...the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger".[255] The Summit has resulted in the affirmation that the increasing number of undernourished people especially in developing countries was not a byproduct of the problems of food supply but mainly a result mainly of access to food.[256] The participants cited that food access is especially a result of the lack of sufficient income in households to purchase food, instability of food supply as well as natural and man-made disasters.[257] Therefore, with due consideration of the prospects of the years ahead wherein the number of population is going to see a spike and the stress this will put on natural resources, the conclusion reached was that food insecurity and hunger are

[248] Kent, Freedom from Want, 52-53.
[249] Ibid.
[250] FAO, Rome declaration on World Food Security and World Food Summit Plan of Action, (Rome: Food and Agriculture Organization, November 13, 1996).
[251] FAO, World Food Summit and its Follow-up, (Rome, FAO 2002e), Available at, http://fao.org/docrep/X2051e/X2051e00.htm
[252] Gonzalez, Human Rights and World Trade, 53-77.
[253] FAO, Rome declaration on World Food Security and World Food Summit Plan of Action, (Rome: Food and Agriculture Organization, November 13, 1996).
[254] Plan of Action, in FAO, Report of the World Food Summit, (Rome 13–17 November 1996), Part I (FAO, 1996).
[255] FAO, Rome declaration on World Food Security and World Food Summit Plan of Action, (Rome: Food and Agriculture Organization, November 13, 1996). It was at this venue that the actual and most popular formulation of food security was coined by FAO. Accordingly, "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". This interpretation of food security as provided by FAO, has given acknowledgement to the four main components of food security to be inclusive of availability of food supply, accessibility, utilization and stability dimensions. See also, Edward Clay, Food Security, Concept and Measurements, Paper for FAO Expert Consultation on Trade and Food Security: Conceptualizing the Linkages, (Rome, FAO: 2002).
[256] FAO, Rome declaration on World Food Security and World Food Summit Plan of Action, (Rome: Food and Agriculture Organization, November 13, 1996).
[257] Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999): 9-10.

likely to persist.[258] In an ambitious move toward ending this, the participating States vowed to reduce by half (800 million) the number of undernourished people no later than 2015.[259] In acknowledgment of the multiple facets that affected food security[260], the participating States adopted seven commitments that were to be achieved both at the national and global level.[261] Alongside the commitments they made, a plan of action[262] was adopted wherein governments specified how to achieve the commitment they have pledged and the degree of support they rendered for it.[263]

In the1996 Rome Declaration, the participating States specifically affirmed their,

> "...political will and common and national commitment towards achieving food security for all and to an ongoing effort to eradicate hunger in all countries, with an immediate view to reducing the number of undernourished people to half their present level no later than 2015".[264]

This Summit had moreover intended to clarify the contents of the right to adequate food as well as the fundamental freedom to be free from hunger, as enshrined in the ICESCR, by devoting particular attention to the matter of implementation and the full and progressive realization of the right to adequate food as an avenue to achieving food security for all.[265] In this regard, the efforts built on the mandate given by the WFS and the concluding Plan of Action which under Article 7(4) made reference to this call by asking the United Nations High Commissioner for Human Rights[266], in tandem with the relevant treaty bodies, and UN specialized agencies, and appropriate inter-governmental mechanisms,

> "To clarify the content of the right to adequate food and the fundamental right of everyone to be free from hunger, as stated in the International Covenant on Economic, Social and Cultural Rights and other relevant international and regional instruments, and to give particular attention to implementation and full and progressive realization of this right as a means of achieving food security for all".[267]

In response to the call made, in 1999, numerous expert consultations were put in place at the international level comprising of, *inter alia*, resolutions adopted by the Commission on

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[258] FAO, Rome declaration on World Food Security and World Food Summit Plan of Action, (Rome: Food and Agriculture Organization, November 13, 1996)., Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999): 9-10.
[259] Rome Declaration on World Food Security and World Food Summit Plan of Action, (Rome: FAO, November 13, 1996., The Plan of Action also made reference to this time frame under paragraph 7 and more briefly under paragraph 60.
[260] This refers to the four interrelated components for ensuring food security; food availability, accessibility, stability and utilization. Therefore, an individual or a given population is said to be food secure given these four pillars of food security are met., See, World Food Summit Plan of Action, (Rome, 1996), CFS, Coming to Terms with Terminology, Revised draft (25 July 2012).
[261] Gonzalez, Human Rights and World Trade, 53-77.
[262] FAO, Rome declaration on World Food Security and World Food Summit Plan of Action, (Rome: Food and Agriculture Organization, November 13, 1996).
[263] Gonzalez, Human Rights and World Trade, 53-77.
[264] FAO, Rome declaration on World Food Security and World Food Summit Plan of Action, (Rome: Food and Agriculture Organization, November 13, 1996).
[265] Ibid; Ziegler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned.
[266] Ziegler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned.
[267] Rome Declaration on World Food Security, November 13, 1996.

Human Rights; a Day of Discussion devoted to the Right to Food under the auspices of the CESCR as well as the conduct of Expert Consultations that were held on the human right to adequate food as were held in Geneva, Rome, and Bonn.[268] In cognizant of these efforts made, as will be discussed below, the CESCR adopted General Comment 12 as an authoritative interpretation of the right to adequate food in 1999[269] along with an explanation of the voluntary code of conduct that deals with the international as well as the national obligation of States regarding the right to food.

Notwithstanding this progress however, it was soon made apparent that the pledges made at the WFS as held in 1996, to half the number of undernourished people by half by 2015[270], had not been realized.[271] With this realization and with the objective of checking the progress that was being made, in 2002, the World Food Summit Five Years Later[272] (WFS-fyl) was convened. In the Summit, the Committee on World Food Security provided its assessment of the progress made over the past five years.[273] The Summit had concluded with the adoption of a Declaration which vowed to eradicate hunger through a concerted effort that called for the creation of an International Alliance Against Hunger to join forces.[274] Participating Governments in the Summit gave the green light for the drawing up of the Voluntary Guidelines for the progressive realization of the right to food.[275] Hence, the Summit that was convened in 2002 unveiled that little progress had been made in meeting this goal of halving the number of undernourished people by 2015 considering that in 2002 there were still 815 million people who were suffering from hunger, according to the FAO.[276] Moreover, it was confirmed that it will have taken until 2030 to meet the goal of halving the number of undernourished people.[277] The Summit came to a conclusion with unsatisfactory results chiefly because the solutions that were proposed[278] to address global hunger and the

[268] Kent, Freedom from Want, 52-53. In April 1999, the United Nations System Standing Committee on Nutrition (then known as the United Nations Administrative Committee on Coordination / Sub-Committee on Nutrition) focused its annual meeting on the human right to adequate food.

[269] The Right to Adequate Food (art. 11. Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999), U.N. doc. E/C.12/1999/5. Gonzalez, Human Rights and World Trade, 53-77. At the Millennium Summit which was held at the UN in 2000, of the eight Millennium Development Goals, goal number one was devoted to the eradication of hunger and malnutrition.

[270] The pledge aimed at halving the number of hungry people by 2015 was also emphasized by the Millennium Summit on poverty, the G-8 Summit in 2001, the UN General Assembly in 2001, the International Conference on Financing for Development in 2002, the Johannesburg Summit also in 2002 and the WTO ministerial meetings. Gonzalez, Human Rights and World Trade, 53-77.

[271] Ziegler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 5-7.

[272] FAO, Declaration of the World Food Summit: Five Years Later, (Rome, FAO: 2002b).

[273] Ibid; Gonzalez, Human Rights and World Trade, 53-77.

[274] Ibid.

[275] FAO, Declaration of the World Food Summit: Five Years Later, (Rome, FAO: 2002b).

[276] FAO, The State of Food Insecurity in the World, (Rome, FAO: 2001)., The FAO had indicated that out of the 815 million people that were suffering from hunger, 777 million were from developing countries, 27 million from transition countries and 11 million from industrialized countries.

[277] FAO, The State of Food Insecurity in the World, (Rome, FAO: 2001). Ziegler, Golay, and Mahon, et al., The Fight for the Right to Food: Lessons Learned, 5-7. It was further revealed that if the calculation was not inclusive of the progress made by China, that world hunger has actually increased from its level at in 1996.

[278] Among the solutions proposed to this end included for instance, biotechnological progress and the hastening of free trade. These proposed solutions were hotly debated among the participant. Another issue that raised intense debate revolved around the call to replace the right to food with food security. Ziegler, Golay, and Mahon, et al., The Fight for the Right to Food, 5-7.

conviction that halving world hunger by half in 2015 were unattainable.[279] After an intense debate on these issues, the Summit ended with a final Declaration that reaffirmed the right to food.[280] In this regard, the third preamble provided the right of everyone to have access to safe and nutritious food while preamble 10 called for the establishment of an Intergovernmental Working Group (IGWG) to elaborate over the next two years a set of "voluntary guidelines to achieve the progressive realization of the right to adequate food".[281] As this section tried to expound, noteworthy efforts by, *inter alia*, the FAO, UN High Commissioner for Human Rights, have provided clarity on, the magnitude of food insecurity that was apparent, contents of the right to food, and guidance to be rendered for States to meeting their obligations. The discussion below will explore General Comment 12[282] as an authoritative interpretation of the right to adequate food by the CESCR.

[279] Ibid.
[280] FAO, 'Declaration of the World Food Summit: Five Years Later', (Rome, FAO 2002b).
[281] Ziegler, Golay, and Mahon, et al., The Fight for the Right to Food, 5-7. The recommendation of the World Food Summit to consider the preparation of "voluntary guidelines" was carried forward in 1997 by three nongovernmental organizations or institutions - FIAN Foodfirst Information and Action Network, the World Alliance on Nutrition and Human Rights and the acques Maritain Institute.
[282] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999).

4. The Committee on Economic Social and Cultural Rights: General Comment 12

The CESCR was established in 1985[283] as a treaty monitoring body concerning the implementation of the ICESCR. In this regard, the CESCR has been empowered to receive and to consider country reports submitted to it by the State Parties'.[284] With the view to stimulating the implementation of the ICESCR at the national legal systems of the Member States, the Committee moreover writes General Comments to the treaty, as a result, clarifying the content of its provisions as well as providing guidance on the implementation of the ICESCR.[285] To this end, in 2008, the UNGA adopted an Optional Protocol[286] to the ICESCR further strengthening this monitoring system[287], as will be explored further below, establishing a procedure for individual, inter-state communications, and an inquiry procedure. In 1999, in response to the above-noted call made by WFS Plan of Action commitment number 7(4), the CESCR adopted its General Comment on the right to adequate food.[288]

In this regard, as part of their Commitment number 7 of the Plan of Action, the participating Heads of State and Government that took part in the WFS-fyl called for the need to monitor, and "...follow-up the Plan of Action at all levels in cooperation with the international community".[289] To this end, commitment 7(4) highlighted the need for the clarification of the right to adequate food and the fundamental freedom of everyone to be free from hunger.[290] Moreover, the provision highlighted that in doing so, particular attention should be devoted to, the full and progressive implementation and realization of this right with the view of achieving food security for all.[291] Consequently, the High-Commissioner for Human Rights undertook several steps to start negotiations with relevant bodies with regards to the clarification of the right to adequate food. Towards this end, for instance, a memorandum of understanding was signed with the FAO for the implementation of objective 7.4.[292] Furthermore, on December 1, 1997, the CESCR held a day of general discussion with experts as well as with the High Commissioner for human rights and held an expert consultation on 2nd December.[293] A noteworthy achievement to these efforts was witnessed when on its 20th

[283] Economic and Social Council Resolution 1985/17, 28 May 1985. Prior to the formation of the Committee on Economic, Social and Cultural Rights, a Working Group of Government Experts on the Implementation of the CESCR of the United Nations Economic and Social Council) was charged with a similar function. For more, See, Gert Westerveen, "Towards a System for Supervising States' Compliance with the Right to Food", in, The Right to Food, (Philip Alston and Katarina Tomasevski eds., 1984); Philip Alston, The Committee on Economic, Social and Cultural Rights in Philip Alston, ed., Human Rights and the United Nations, 473 (1992).
[284] See, UN General Assembly, International Covenant on Economic, Social and Cultural Rights, 16 December 1966, in force, 3 January, 1976, U.N, United Nations, Treaty Series, vol. 993: Article 21 and 22.
[285] Ibid.
[286] United Nations General Assembly, "Optional Protocol to the International Covenant on Economic, Social and Cultural Rights ", Resolution adopted by the General Assembly, A/RES/63/117, (March 5 2009, Entered into Force, 5 May 2013.
[287]Ibid.
[288] FAO, 'Declaration of the World Food Summit: Five Years Later', (Rome, FAO 2002b).: Commitment 7(4).
[289] Ibid, Commitment 7.
[290] Ibid, Commitment 7(4).
[291] Plan of Action, in FAO, Report of the World Food Summit, (Rome 13–17 November 1996), Part I (FAO, 1996).: Commitment 7(4).
[292] Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999): Paragraph 12-13.
[293] Ibid.

Session, the CESCR adopted its General Comment on the right to adequate food on May 12, 1999.[294] The discussion below will be devoted to an examination of General Comment 12.

4.1. Foundational Principles

In it's General Comment 12[295] on the right to adequate food as contained in Article 11 of the ICESCR, the CESCR has given an authoritative interpretation to the normative contents, ensuing State obligations as well as modalities of implementation at the national level, by the State Parties. It has to be highlighted here that General Comments in and of themselves are not legally binding.[296] However, they are instrumental in rendering a highly authoritative interpretation of human right provisions within the UN human right system, *inter alia*, rights as contained in the ICESCR.[297] For this reason, they enjoy a particular authority and are for the most part observed and respected by the State Parties to the ICESCR.[298] With this in mind, the section below will examine in detail General Comment 12 on the right to adequate food.

According to the CESCR, the right to adequate food is based on the foundational principle of the human right system which is to be found under Article 1 of the UDHR which states, "Everyone is born free and equal in dignity and rights and should act towards one another in the spirit of fraternity".[299] This very notion is to be found in General Comment 12 in that it conjoins the right to adequate food as being linked to "...the inherent dignity of the human person and is indispensable for the fulfillment of other human rights as enshrined in the International Bill of Human Rights".[300] Hence, as already noted, the human right to adequate food is of vital importance for the enjoyment of all rights. Therefore, the obligation to ensure the right to food,"...applies to everyone" under a State's jurisdiction.[301] As such, the obligation cannot be limited to citizens of a State Party only or particular ethnic groups but extends to everyone including immigrants or refugees.[302] For this reason, the phrasing as used by the CESCR under Article 11(1), “for himself and his family”, is not to be read as implying a limitation on the applicability of this right in the case of individuals and households headed by women.[303] For the CESCR, the right to adequate food is also inseparably linked to social

[294] Ibid.
[295] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999).
[296] This is because they do not create legal obligations on the State Parties.
[297] Office of the UN High Commissioner for Human Rights, Human Rights Bodies—General Comments, Available at, http://www2.ohchr.org/english/bodies/treaty/comments.htm, Accessed on 26/02/2019.
[298] Ibid.
[299] See, United Nations General Assembly, Universal Declaration of Human Rights, 10 December 1948, 217 A(III): Article 1.
[300] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 4.
[301] Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2001/53, (February 7, 2001): Paragraph 1).
[302] Kent, Freedom from Want, 55-56. The ensuing obligations on States to ensure the right to adequate food applies to everyone including migrants even if they are in the country illegally.
[303] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 1. The right to food also refers to the "freedom from want and freedom from hunger" which constitute the "Third Freedom" as envisioned by President Ronald Roosevelt. See, Franklin D. Roosevelt,

justice requiring the adoption of economic, social, environmental policies both at the national and international level.[304] Moreover in this respect, it is vital to note that the right to food is not only concerned with solid foods but also that of liquid foods, such as safe water.[305] As such, the right to adequate food is to be interpreted as inclusive of the right to water.[306] In this respect, according to the CESCR, "the right to water clearly falls within the category of guarantees essential for securing an adequate standard of living, particularly since it is one of the most fundamental conditions for survival".[307]

According to the CESCR, the normative/core contents the right to adequate food consists of the availability and accessibility of adequate food to everyone.[308] As noted earlier, Article 11 is presented as encompassing two separate, but interrelated norms.[309] In the ICESCR, the right to adequate food is first presented as the right of everyone to an adequate standard of living including food and under sub-Article 2, as the fundamental right of everyone to be free from hunger. In the light of this, the CESCR highlights that "...more immediate and urgent steps may be needed to ensure" the fundamental right to freedom from hunger and malnutrition.[310] As such, hunger and malnutrition signify "...more acute, more urgent problems..." than what is indicated by inadequate food in itself.[311]

It can be highlighted here that, as noted above, there is a distinction which is to be drawn between the two notions as used under Article 11. This is because the fundamental right of everyone to be free from hunger is the only right that has been considered as fundamental.[312] This is because the enunciation of this provision as fundamental shows that the right is meant to highlight its notable role for the realization of other economic, social and cultural rights

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The Annual Message to Congress January 6, 1941, in 9 Public Papers and Address of Franklin D. Roosevelt, (S. Rosenman ed.,1941): 672.

[304] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 4.

[305] See, UN Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 15: The Right to Water (Arts. 11 and 12 of the Covenant), 20 January 2003, E/C.12/2002/11; Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2003/54, (January 10, 2003); Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2001/53, (February 7, 2001); Resolution 2001/25 of the Commission on Human Rights.

[306] See, Committee of Economic Social and Cultural Rights, General Comment 14 on the right to the highest attainable standard of health; Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 15: The Right to Water (Arts. 11 and 12 of the Covenant), 20 January 2003, E/C.12/2002/11; Commission on Human Rights Resolution 2001/25, 20 April 2001. The Commission on Human Rights requested the Special Rapporteur on the right to food in 2001 "to pay attention to the issue of drinking water, taking into account the interdependence of this issue and the right to food". Jean Ziegler, Report of the Special Rapporteur on the right to food to the General Assembly, Chapter IV; E/CN.4/2003/54, (10 January 2003).

[307] According to the CESCR, even though the meaning of adequate water may vary in different situations, in all circumstances, the factors of availability, quality and accessibility are applicable. See, the UN Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 15 (2003): Paragraph 3 and 12.

[308] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 8.

[309] See, Alston, "International Law and the Human Right to Food".

[310] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 1.

[311] Kent, Freedom from Want, 55-56.

[312] Sven Sollner, "The Breakthrough of the Right to Food: The Meaning of General Comment Number 12 and the Voluntary Guidelines for the Interpretation of the Right to Food", (A. Von Bogdandy and R. Wolfrum eds.), Max Planck Year Book of United Nations Law, Vol. 11, (2007): 391-415.

(ESCR) including civil and political rights (CPR).[313] Hence, the term signifies the "absolute" standard, the minimum level that should be secured for all irrespective of the level of development of a given state".[314]

Moreover, given that human rights are interdependent, indivisible, inalienable[315], the fundamental right to be free from hunger is to be linked to the right to life.[316] In its elaboration to this right, the Committee on Human Rights[317] has provided that States should take positive and all possible measures to, "...reduce infant mortality and to increase life expectancy, especially in adopting measures to eliminate malnutrition and epidemics". Hence, the utilization of the two concepts in tandem as representing the right to adequate food highlights the fact that hunger and malnutrition are not only problems of availability of adequate food but also that of accessibility; *inter alia*, "...poverty, income disparities and lack of access to health care, education, clean water and sanitary living conditions".[318] As will be further discussed later, this elucidation under Article 11 has serious practical implications on the State Parties concerned in that while the freedom from hunger requires the State to provide food for those who are unable to meet their needs for reasons that are beyond their control, the latter (adequate standard of living), connotes the progressive improvement of living conditions so that people can have equal and regular access to resources and opportunities so as to allow every individual is enabled to provide for his/her needs.[319] As such, considering that people provide their own food under normal circumstances to meet their demands, either through own production or procurement, they should be granted access to land, water, and other productive resources.[320] Furthermore, in order to procure their food according to their preferences, people need access to paid employment or other means of procurement.[321]

[313] Sollner, "The Breakthrough of the Right to Food," 391-415.
[314] Ibid.
[315] See, Vienna Declaration and Programme of Action, World Conference on Human Rights, Vienna, (14–25 June 1993), A/CONF157/24: Article I (5). The provision states that, "All human rights are universal, indivisible and interdependent and inter related. The international community must treat human rights globally in a fair and equal manner, on the same footing, and with the same emphasis. While the significance of national and regional particularities and various historical, cultural and religious backgrounds must be borne in mind, it is the duty of States, regardless of their political, economic and cultural systems, to promote and protect all human rights and fundamental freedoms".
[316] See, International Covenant on Civil and Political Rights, 19 December 1966, 999 UNTS 171, Can TS 1976 No 47 (entered into force 23 March 1976) [ICCPR]: Article 6.
[317] See, UN Human Rights Committee (HRC), CCPR General Comment No. 6 (1982): Paragraph 5.
[318] The Right to Food: Guide on Legislating on the Right to Food, (Rome, FAO, 2009): 7-30.
[319] Ibid.
[320] Ibid.
[321] Ibid.

4.2. The Availability Dimension of Adequate Food

In its efforts to provide clarity to the core contents of the right, the CESCR has provided the normative contents of the right to adequate food as including both the availability and accessibility of adequate food.[322] Accordingly, the availability of adequate food is concerned with ensuring "...the availability of adequate food in quantity and quality sufficient to satisfy the dietary needs of the individual, free from adverse substances and acceptable within a given culture".[323]

The accessibility dimension of the right to food has been defined as referring to "the accessibility of available food in a sustainable way and that do not interfere with the enjoyment of other human rights".[324] This connotes that an individual or a particular community has economic access to food as a result of engagement in an economic activity, either directly to the natural resources as are required for food production, such as, land, water, as well as other resources and means of production, *inter alia*, skills, knowledge, and markets.[325] Hence, as will be elaborated subsequently, the inclusion of the two constituent elements of the right to food reinforces the obligation put on State Parties that aside from meeting the satisfaction of the bare minimum needed to mitigate and alleviate hunger, that they must ensure better living conditions for their people.[326] For this reason, the CESCR has noted the right to food "...shall not be interpreted in a narrow or restrictive way which equates with a minimum package of calories, proteins, and other nutrients".[327] This elucidation highlights that the simple provision of food by "...simply delivering prepackaged meals in the way one might deliver feed pellets to livestock" is insufficient to fulfill the right to food.[328] Moreover, this way of approaching the right to food would be incompatible with human dignity.[329] This is because the sole delivery of food without due regard to how the food available can be accessed would only be sensible during times of short-term emergency.[330] In this regard, the CESCR has provided that "the roots of the problem of hunger and malnutrition are not lack of food but lack of access to available food, *inter alia*, because of poverty, by large segments of the world's population".[331] As such, the mere availability of food cannot be the means for realizing the human right to adequate food over the long run.[332]

In this regard, the First Special Rapporteur on the right to adequate food, Jean Ziegler, has defined the right to food to imply,

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[322] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 8.
[323] Ibid.
[324] Ibid.
[325] Ibid, Paragraph 13; Sollner, "The Breakthrough of the Right to Food", 391-415.
[326] The Right to Food: Guide on Legislating on the Right to Food, (Rome, FAO, 2009): 7-30.
[327] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 6.
[328] Kent, Freedom from Want, 55-56.
[329] Ibid, 41.
[330] Ibid.
[331] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 5.
[332] Kent, Freedom from Want, 54-58.

> "...the right to have regular, permanent and free access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, and which ensures a physical and mental, individual and collective, fulfilling and dignified life free of fear".[333]

Reiterating the essence of this definition, the CESCR provides in its General Comment that the right to food is realized when, "...every man, women, and child along or in community with others has physical and economic access to adequate food and means of procurement".[334]

[333] Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 15.
[334] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): paragraph 6.

4.3. The Accessibility Dimension of the Right to Food

Another key notion as provided by the CESCR relates to "accessibility" that has been interpreted as connoting two notions; physical and economic.[335] Accordingly, economic accessibility has been elaborated to consist of three interrelated components. Firstly, it ensures "...that personal or household financial costs associated with the acquisition of food for an adequate diet should be at a level such that the attainment and satisfaction of other basic needs are not threatened or compromised".[336] Secondly, as a measure of the degree to which acquisition pattern or entitlements are satisfactory for the enjoyment of the right to food, it serves to highlight "...any acquisition pattern or entitlement through which people procure their food".[337] Lastly, economic accessibility vows to emphasize that "Socially vulnerable groups such as landless persons and other particularly impoverished segments of the population may need attention through special programmes".[338] Therefore, food accessibility is ascertained when individuals and communities have access to food as a result of economic activity by making use of natural resources (land, pasture, water, fishing grounds...) as well as means of production.[339] As such, absent the possibility of food procurement, food accessibility is not going to be realized.[340]

Physical accessibility, on the other hand, is preoccupied with ensuring the accessibility of adequate food to everyone "...including physically vulnerable individuals, such as infants and young children, elderly people, the physically disabled, the terminally ill and persons with persistent medical problems, including the mentally ill".[341] In this regard, the CESCR cautions however that special attention should be given to "...victims of natural disasters, people living in disaster-prone areas and other especially disadvantaged groups may need special attention and sometimes priority consideration with respect to accessibility of food".[342] When the principle of physical accessibility is closely looked at, it is evident that the CESCR has incorporated the principle of non-discrimination as a novel principle of the accessibility principle.[343] In cognizant of this, the provision states that food must be accessible for all including the physically vulnerable and marginalized section of society (young children, elderly people, the physically disabled, and indigenous groups).[344] Moreover, the CESCR cautions that the "...particular vulnerability...of many indigenous population groups whose

[335] Ibid, Paragraph 13.
[336] Ibid; Zeigler, Golay Mahon, et al., The Fight for the Right to Food: Lessons Learned, 15- 17.
[337] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.
[338] Ibid.
[339] See, Sollner, "The Breakthrough of the Right to Food", 391-415.
[340] Ibid.
[341] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.
[342] Ibid.
[343] Sollner, "The Breakthrough of the Right to Food", 391-415; The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13 and 18.
[344] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.

access to their ancestral lands may be threatened" must be taken into consideration.[345] This implies that physical accessibility is approached differently when seen in the light of the ingredients that ensure economic accessibility as discussed above in that it has been detached from whether access to food is a byproduct of economic activity, entitlement or acquisition pattern.[346] Thus, physical accessibility is not dependent on the economic activity of a person in that the purchasing power of a person would fulfill the physical accessibility of food to the person.[347] Therefore, in its authoritative interpretation to Article 11 of the ICESCR, the CESCR has rendered clarity to the right to adequate food as inclusive of the above-explored core contents.

[345] Ibid.
[346] Sollner, "The Breakthrough of the Right to Food" 391-415.
[347] Ibid.

4.4. Core Components for Ensuring the Right to Adequate Food

Based on this elaboration provided by the CESCR, this section will explore the various but interrelated components of the right to adequate food.

According to the CESCR, the reference to the right to "adequate food" implies that it is to be realized "...when every man, women or child alone or in community with others has physical and economic access to adequate food or means of its procurement".[348] Hence, adequate food must be, able to satisfy the dietary needs of the individual, free from adverse substances and acceptable within a given culture".[349] Additionally, the concept of "adequacy" is used to underline "...a number of factors that must be taken into account so as to determine whether particular foods or diets that are accessible can be considered the most appropriate under given circumstances".[350] Hence, the notion of adequacy, even though is to an extent to be determined by existing economic, social, political, environmental and ecological and other conditions, there are core elements that are applicable in all circumstances.[351] The CESCR relates adequacy with dietary needs, the absence of adverse substances, and cultural or consumer acceptability.[352] As such, the provision enunciates that adequate food must be, "... sufficient to satisfy the dietary needs of individuals, free from adverse substances, and acceptable within a given culture".[353] This implies that the food available must satisfy peoples' needs while taking into recognition the individual's age, living conditions, health, and occupation.[354]

The notion of "sustainability" has been clarified to imply the long term availability as well as accessibility of adequate food.[355] It is related to the concept of adequate food or food security which implies that food is available for present and future generations.[356] Therefore, the term entails both the physical and economic availability and accessibility of adequate food for different groups of people.[357]

Furthermore, the principle of "sufficient food" meeting the "dietary needs" contains a positive quantitative side of the right to food[358] of the individual. It connotes that the "...diet as a whole contains a mix of nutrients for physical and mental growth, development and maintenance, and physical activity that are in compliance with human physiological needs at all stages

[348] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 6.
[349] Ibid, Paragraph 8.
[350] Ibid, Paragraph 7.
[351] Ibid.
[352] Ibid, Paragraphs 7-11; Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2001/53, (February 7, 2001): 7-8.
[353] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 8.
[354] FAO, The Right to Adequate Food, FACT Sheet No. 34 (Geneva, FAO and Office of the High Commissioner on Human Right, 2010).
[355] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 7; Zeigler, Golay Mahon, et al., The Fight for the Right to Food: Lessons Learned, 15- 18.
[356] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 7.
[357] Ibid, Paragraph 12-13.
[358] Sollner, "The Breakthrough of the Right to Food", 391-415.

throughout the life cycle and according to gender and occupation".[359] The same provision moreover provides the kind of actions that should be taken in this regard so as to ensure an adequate dietary intake. The CESCR has provided that,

> "Measures may, therefore, need to be taken to maintain, adapt or strengthen dietary diversity and appropriate consumption and feeding patterns, including breastfeeding, while ensuring that changes in availability and access to food supply as a minimum do not negatively affect dietary composition and intake".[360]

This elucidation of "dietary needs" by the CESCR is related to the notion of malnutrition which is characterized by the lack or shortage of micronutrients, vitamins/organic molecules and minerals/inorganic molecules in the food which otherwise provides sufficient calories.[361] As such, this concept is to be differentiated with that of hunger/undernourishment which represents the insufficient supply of calories or complete lack thereof.[362] Therefore, a diet that contains sufficient calories[363] but which is short of needed micronutrients may affect cells and the nervous system.[364] This is, for instance, to be discerned with children who suffer from stunted growth, infections, and other disabilities.[365]

Similarly, the CESCR has also provided in its General Comment that "...the right to adequate food shall therefore not be interpreted in a narrow or restrictive sense which equates it with a minimum package of calories, proteins and other specific nutrients"[366] hence implying that the right to food encompasses a broader meaning. Therefore, the right to adequate food is to be realized progressively even though States have the core obligation to mitigate and alleviate hunger as connoted under Article 11(2) of the ICESCR.[367] This obligation on the State Parties is to be realized even during periods of natural or other disasters.[368]

The allusion that the food available "should be free from adverse substances" highlights the quality dimension of the right in that it entails that the food obtained, "...must fulfill minimum

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[359] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 9.
[360] Ibid.
[361] Commission on Human Rights, Report by the Special Rapporteur on the right to food, E/CN.4/2001/53, (February 7, 2001): 7-8.; Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 15-18.
[362] Commission on Human Rights, Report by the Special Rapporteur on the right to food, E/CN.4/2001/53,(February 7, 2001): 7-8; United Nations Children's Fund (UNICEF), The State of World's Children, Focus on Nutrition (New York, Oxford University Press, 1998): 19. Over the life cycle, malnutrition can be passed on from generation to generation, leading to a vicious circle where malnourished mothers give birth to babies who are themselves physically and mentally underdeveloped, and then pass these problems onto their own children.
[363] Calorie' is a term used in physics which is used as a unit to measure the amount of energyconsumed by the body. For details on the measurement method, see Jean-Pierre Girard, L'Alimentation, (Geneva, Georg, 1991).
[364] Commission on Human Rights, Report by the Special Rapporteur on the right to food, E/CN.4/2001/53, (February 7, 2001): 7-8.
[365] Ibid.
[366] Ibid, Paragraph 6.
[367] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 6.
[368] Ibid.

safety standards, without contamination through adulteration, unsatisfactory environmental hygiene or inappropriate handling at different stages throughout the food chain".[369]

In addition to the above, the right to food also connotes a non-nutrient related right in that the right should correspond to people's culture. As such, the notion of "cultural and consumer acceptability" implies, "...the need also to take into account the perceived non-nutrient-based values attached to food and food consumption and informed consumer concerns regarding the nature of accessible food supplies".[370] Even though the utilization component of the food security[371] has not been made part of the constituents of the right to food, it can, however, be discerned in the adequacy component of the right to food.[372]

[369] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 10.
[370] Ibid, Paragraph 11.
[371] Stability of food supply is one of the integral components for ensuring food security. Accordingly, stability in food supply is to be reached when a reliable supply of food products is available at all times and for all people. This component of food security hence deals with the removal of uncertainties through an effective, constant, and balanced supply system as determined by the temporal availability of and access to food. See, FAO, Food and Agriculture Organization of the United Nations. Climate change and food Security: A Framework Document, (Rome, FAO 2008); WFP, "Hunger and Markets", World Hunger Series, (WFP and Earthscan, Rome, London: 2009).
[372] The Right to Food: Guide on Legislating on the Right to Food, (Rome, FAO, 2009): 7-30.

5. State Obligations and Violations

The implementation of the right to food by the State Parties to the ICESCR is guided, as explored succinctly, mainly by the General Comment[373] as provided by the CESCR.[374] State Parties to the ICESCR[375] are duty bound to implement the obligations enshrined in the Covenant. This is to be derived from international law standards that grant due emphasis on the need to respect the State's sovereignty and free will, which stresses that a State cannot be bound to a treaty without its consent.[376] A cumulative reading of this highlights that the State Parties to the ICESCR by giving their consent to be bound by the principles enshrined have consented to be bound by the ensuing obligations enshrined therein.[377] Hence, this highlights that the State Parties have incurred obligations with regard to the right to adequate food as contained in Article 11 of the ICESCR. The discussion below will expound the ensuing obligations incumbent on the State Parties to the ICESCR so as to realize the right to adequate food.

[373] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999).
[374] The implementation of the right to adequate food is also to be guided by the Voluntary Guidelines for the Progressive Realization of the Right to Food, the Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security, (FAO Council, 2004). See, Hospes & Hadiprayitno, eds., "Governing Food Security", 92-93.
[375] As of September 2018, the ICESCR has 168 Signatories, See, United Nations Treaty Collection, Accessed on 01/02/2018, Available at, https://treaties.un.org/pages/ViewDetails.aspx?src=IND&mtdsg_no=IV-3&chapter=4&lang=en
[376] See, United Nations, Vienna Convention on the law of Treaties between States and International Organizations, March 12 1986: Article 2(1) (b).
[377] Ibid.

5.1. Tri-polar Duties to Realize the Right to Food

Three types of State obligations incumbent on the State Parties to the ICESCR referring to, in UN parlance, the duties to respect, protect and fulfill, have been in common use since the 1980s.[378] Since then this typology is being employed by UN institutions dealing with CPR and the ESCR. The same parlance has been extended in relation to the right to food as introduced by the Special Rapporteur on the right to food for the sub-Commission on Prevention of Discrimination and Protection of Minorities, Asbjorn Eide.[379] Since then, the CESCR in it's General Comment 12[380], has further refined these State duties with respect to the right to food. These duties have also been made an integral part of the Voluntary Guidelines for the progressive Realization of the Right to Adequate Food.[381]

The above-discussed elucidation provided in Article 11 of the ICESCR has been a subject of misinterpretation in that the State has been regarded as the main provider of the rights as enshrined therein. As a result, this misperception has evoked some hesitation, "...on the assumption that they were costly, undermined creativity, removed incentives and led to an overgrown State apparatus".[382] Similar to other human rights covenants wherein the treaty ratifying State is considered to be a duty bearer and the individual as a rights holder, the State Parties to the ICESCR in general and specifically in relation to the right to adequate food have given their consent to be bound by the obligations constituted therein toward the public.[383] Here, the State obligation vis-*à*-vis the realization of the right to adequate food is not about the State as a provider of adequate food but rather the State as a provider of an enabling environment by which people can realize the right to food.[384] In this regard, according to Article 2 of the United Nations Declaration on Development[385], the individual is an active subject and not the object of social and economic development. This connotes that individuals seek to ensure their livelihoods either individually or in cooperation with others by making use of available resources, *inter alia*, land, capital, and labor, in tandem with the needed knowledge so as to efficiently utilize the resources they own.[386] Therefore, given the fact that

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[378] Katarina Tomasevski and Alston Philip, (eds.), The Right to Food, International Studies in Human Rights, (Utrecht, 1984).

[379] Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999); Right to Adequate Food as a Human Right, Human Rights Study Series No. 1, (United Nations, New York, 1989).

[380] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999). The CESCR in its general comment 12, Paragraph 15, has generally endorsed the three levels of obligations as proposed by Asbjorn Eide in 1989. The current stipulation by the CESCR has however subdivided the third level into the obligation to facilitate and to provide (fulfill). See, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999).

[381] Moreover, the three obligations placed on States by virtue of the existence of the right to food also apply to intergovernmental organizations, particularly the United Nations. See, Commission on Human Rights, Report by the Special Rapporteur on the right to food, E/CN.4/2001/53, (February 7, 2001).

[382] The Right to Food in Theory and Practice, (Rome, FAO 1999).

[383] Hans Morten Haugen, The Right to Food and the TRIPS Agreement: With a Particular Emphasis on Developing Countries' Measures for Food Provision and Distribution, (Koninklijke Brill nv, Leiden, The Netherlands 2007).

[384] Haugen, The Right to Food and the TRIPS Agreement.

[385] UN General Assembly, Declaration on the Right to Development: resolution/adopted by the General Assembly, 4 December 1986, A/RES/41/128.

[386] The Right to Food in Theory and Practice, (Rome, FAO 1999).

individuals, families, and groups seek to find their solutions to meet their needs, the State will bear the responsibility to, on the first hand, respect the resources owned by individuals, to make use of the knowledge he/she possesses in an optimal way, and to make use of the necessary actions and necessary resources to satisfy his or her own needs.[387] This said however, the State concerned should not be passive in that to the level that others (third parties) may intervene, the State concerned has the obligation to protect those affected.[388] Hence, secondly, the duty to protect individuals/public against third-party action constitutes the other obligation borne by State Parties. Thirdly, the State concerned bears the obligation to fulfill social and economic rights by, "facilitating" opportunities so that the rights enshrined will be enjoyed. Moreover, this obligation also extends to the duty to "fulfill" the right when it is insufficiently protected.[389] The duty borne by States to facilitate, when seen in the light of the right to adequate food, implies action taken with a view to, "...improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems...", to achieve "...the most efficient development and utilization of natural resources".[390] The discussion below will explore further these State duties in relation to the right to adequate food.

5.1.1 The Duty to Respect

A State is said to have fulfilled/observed its duty to respect the right to food when it is able to ensure that every individual living in its territory has permanent access at all times to sufficient and adequate food.[391] The *a contrario* reading of this duty implies that the State concerned should refrain from taking any arbitrary action that would deprive the individual of the right to food or make it difficult to gain access to food.[392] This duty hence puts a negative obligation on the State Party as it imposes a limit on State power that may infringe peoples' existing access to food.[393] As such, the duty to respect requires the State to abstain from taking measure, through actions, policies or the failure to act by its own agencies and public officials[394] that would violate access of everyone to adequate food.[395] According to Asbjorn Eide, this obligation mainly entails that States should respect the resources owned by the

[387] Ibid.
[388] Ibid.
[389] Ibid.
[390] See, The United Nations General Assembly. 1966. "International Covenant on Economic, Social, and Cultural Rights." Treaty Series 999 (December): 171.: Article 11(2).
[391] Report by the Special Rapporteur on the right to food, E/CN.4/2001/53, (February 7, 2001).
[392] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12: The Right to Adequate Food (Art. 11)," Adopted at the Twentieth Session of the Committee on Economic, Social and Cultural Rights, E/C.12/1999/5, (12 May 1999).: Paragraph 15; Report by the Special Rapporteur on the right to food, Economic E/CN.4/2001/53, (February 7, 2001).
[393] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 15; Zeigler, Golay Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.
[394] FAO, The Right to Food: Guideline on Legislating for the Right to Food, (Rome, FAO, 2009): 25-26.
[395] Report by the Special Rapporteur on the right to food, E/CN.4/2001/53, (February 7, 2001).

individual (he/she).[396] Moreover, the State concerned should pay respect to the individual's freedom to find a job based on preference.[397] Finally, this duty also requires the State to give the freedom to the individual so as to make an optimal use of her/his own knowledge and the freedom to take the necessary actions as well as the employment of necessary resources - alone or in association with others - to the end of satisfying his or her own needs.[398]

This said it is imperative to explore which actions of the State would amount to a violation of the duty to respect the right to food. For instance, the eviction or displacement of people by the State from their land that primarily serves as the basis of their livelihood would constitute a violation of its duty to respect.[399] Moreover, a government that has taken away the provision of social security devoid of ensuring that the most vulnerable people have alternative ways to feed themselves, or when a government knowingly introduced toxic substances into the food chain, while access to food requires that the food available is 'free from adverse substances', will be acting in violation of its duty to respect.[400] The obligation to respect additionally implies that in situations of armed conflict, for instance, that government troops should not block, delay or divert food aid supplies destined to civilians.[401] Additionally, the State concerned will have infringed its obligation to respect if it denies food access to political opponents.[402] The suspension of legislation or policies that ensure access to food to the public; social welfare legislation, and nutritional education programs, is a violation of this duty.[403]

Therefore, a government will be duty-bound to ensure that State institutions, including institutions run by the State or the military, do not deprive people of access to food through the contamination or destruction of farmland as a result of forced evictions.[404] The fulfillment of the duty to respect moreover requires States to regularly evaluate their national food policies and programs with the view to ensure that they effectively comply with the obligation to respect the equal right of everyone to food.[405]

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[396] Commission on Human Rights, The Realization of Economic, Social and Cultural Rights: The Right to Adequate Food and to be Free from Hunger, (June 28, 1999), E/CN.4/Sub.2/1999/12.
[397] Ibid.
[398] Ibid.
[399] See, Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.
[400] Ibid.
[401] Ibid.
[402] The Right to Adequate Food, Fact sheet 34, (Geneva, FAO and the office High Commissioner for Human Rights, 2010): 18-19.
[403] Ibid.
[404] Ibid. As an illustrative case in point can be cited a situation when a Government at war with part of its own population deprives the part of the population it sees as "hostile" of access to food. A similar example of non-observance of the right to food by a Government, as described by the Special Rapporteur on the situation of human rights in the Sudan, is the tragedy of Bar-el-Ghazal, where tens of thousands of people died of starvation in 1998.
[405] Ibid.

5.1.2. Duty to Protect

The State Parties to the ICESCR have additionally assumed the duty to protect the right to food.[406] This duty requires the State concerned to ensure that individuals and companies do not deprive the public of their right to access adequate food.[407] Contrary to the duty to respect wherein States/Governments have assumed a negative duty not to intervene with peoples' access to food, the obligation to protect imposes a positive duty on the State to "…promote production, redistributive taxation, and social security or to combat corruption" so that people can have access to adequate and sufficient food.[408] In addition to this, similar to the State obligation to respect, this obligation also entails that people should not be threatened by others/third parties who may be motivated to interfere.[409] Hence, the duty to provide security against threats that may arise from within/outside the Country, constitutes one core duty/function of Governments all over the world[410] and according to the former Special Rapporteur[411], "...is the most important aspect of State obligations with regard to economic, social and cultural rights, similar to the role of the State as protector of civil and political rights". The Special Rapporteur, Asbjorn Eide, moreover has elaborately provided that, the duty to protect encompasses,

> "...active protection against other, more assertive or aggressive subjects—more powerful economic interests, such as protection against fraud, against unethical behaviour in trade and contractual relations, against the marketing and dumping of hazardous or dangerous products".[412]

This said a State will have violated its duty to protect in the context that powerful individuals have evicted people from their land, and a Government has failed to take action in the circumstance that corporations have engaged in the pollution of a community's water supply.[413] In this regard, actions which are taken that result in the denial of access to food on the basis of gender, race or other forms of discrimination, result in the infringement of this obligation.[414]

Therefore, as part of its duty to protect, the State concerned is duty bound to introduce, for instance, laws that would protect consumers against harmful food products or forms of production that are unsustainable.[415] Here, it will be imperative on the State to ensure that the food which is put in the market is safe and nutritious. In this regard, the introduction of

[406] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), General Comment No. 12 (1999): Paragraph 15.
[407] Ibid.
[408] Commission on Human Rights, Report by the Special Rapporteur on the right to food, E/CN.4/2001/53, (February 7, 2001):10-11.
[409] For more, see, Kent, Freedom from Want, 103-115.
[410] Ibid.
[411] Commission on Human Rights, Report by the Special Rapporteur on the right to food, E/CN.4/2001/53, (February 7, 2001): Paragraph 52.
[412] Ibid.
[413] See, Zeigler, Golay Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.
[414] Ibid.
[415] Ibid.

labeling on food and safety standards as well as the provision of legislation on the use of pesticides and genetically engineered food can be few of the remedies to be taken by the State concerned.[416] Moreover, States should also take legislative and other measures in order to protect people, especially children, from the advertisement and promotion of unhealthy food with the objective of promoting healthier patterns of eating and physical exercise.[417] The State is furthermore duty bound to take into consideration its international obligations on the right to food when entering into agreements with other States or international organizations.[418]

As part of its duty to protect, it is incumbent on the state to guarantee that title to land is ensured to those people - such as indigenous peoples - that have a close cultural link to the land.[419] This obligation moreover requires the State concerned to formulate and enforce laws in order to prevent third parties (other individuals, groups, and private enterprises) from violating the right to food. In this vein, the State would have to enforce laws with the view to regulate non-state actors (corporations and individuals) from infringing the right to food.[420] To this end, governments are required to establish bodies in order to carry out investigation and provide effective remedies, such as access to justice, when such a violation has occurred.[421] Hence, States should prevent third parties from destroying sources of food through, for instance, the pollution of land, water and air with hazardous industrial or agricultural products or the ancestral lands of indigenous peoples with the view to clear the way for different activities, *inter alia*, mines, dams, highways or industrial agriculture.[422]

5.1.3. The Duty to Fulfill (Provide and Facilitate)

The third obligation put on States Parties as signatories to the ICESCR is the duty to fulfill, which has two components; the duty to facilitate and provide.[423] According to the CESCR, the duty to provide relates to a situation wherein, "… whenever an individual or group is unable, for reasons beyond their control, to enjoy the right to adequate food by the means at their disposal, States have the obligation to fulfill (provide) the right to food directly". [424] This obligation requires the State concerned to facilitate peoples', mainly the most vulnerable among them, ability to feed themselves by identifying vulnerable groups in order to ensure their access to adequate food.[425] This said, the obligation to fulfill (facilitate) concerns according to the CESCR that, "...the State must proactively engage in activities intended to

[416] Ibid.
[417] FAO, The Right to Adequate Food, Fact Sheet 34, (Geneva, FAO and the High Commissioner for Human Rights, 2009).
[418] Ibid.
[419] See, Clapham, Human rights: A very short introduction.
[420] See, Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.
[421] Ibid.
[422] FAO, The Right to Adequate Food, Fact Sheet 34, (Geneva, FAO and the High Commissioner for Human Rights, 2009).
[423] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), General Comment No. 12 (1999): Paragraph 15.
[424] Ibid.
[425] See, Zeigler, Golay Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.

strengthen people's access to and utilization of resources and means to ensure their livelihood, including food security".[426]

Hence, the duty to fulfill - facilitate and provide - impose a positive obligation which requires the State to take needed action to identify vulnerable groups and adopt policies in order to ensure that they are able to access adequate food and are able to feed themselves.[427] This means that more than the obligations to respect and provide, the obligation to fulfill is dependent on the availability of resources.[428] The ICESCR under Article 11(2) provides in this regard that, the actions to be taken by the State concerned comprise of those steps as needed to, "...improve measures of production, conservation, and distribution of food by making full use of technical and scientific knowledge and by developing or reforming agrarian systems".[429] As such, the State is bound to ensure proactively the public's access to and the use of resources to enable them to ensure their livelihoods.[430] Additionally, the State is required to balance its food policies mainly between, for example, production-oriented towards cash crops as meant for exports and that which is needed for domestic food production.[431] Actions to be taken by the States concerned may include among others, improving employment prospects by introducing an agrarian reform program for landless groups or promoting alternative employment opportunities. It could also include, for example, free milk programs in schools in order to improve child nutrition.[432]

The obligation to fulfill also puts an obligation on States not to be limited in their duty to facilitate the right to food but also to provide the right when peoples' food security is threatened for reasons that are beyond their control.[433] Hence, the obligation to provide requires the State to ensure at the minimum that no persons suffer from hunger.[434] This obligation is incumbent on the State Parties given there is a shortfall in assuring to every individual an adequate nourishment through the obligations, to respect, protect, and fulfill - facilitate.[435] This said, the State is only duty bound to provide for those categories of people who are unable to provide for themselves under extreme circumstances. Hence, this highlights that the State here acts only as "a provider of last resort" to the most needy but not towards those "...who are healthy and have reasonable access to employment or to productive resources" and who are able to provide for themselves.[436] In circumstances such as this, the State concerned may have to provide direct assistance for the people in need such as, the provision of safety nets like, food voucher schemes or social security provisions in order to

[426] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), General Comment No. 12 (1999): Paragraph 15.
[427] See, Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.
[428] See, Sollner, The Breakthrough of the Right to Food", 391-415.
[429] See, The United Nations General Assembly. 1966. "International Covenant on Economic, Social, and Cultural Rights." Treaty Series 999 (December): 171.: Article 11(2).
[430] The Right to Adequate Food, Fact Sheet No. 34, (Geneva, FAO and the Office of the United Nations High Commissioner for Human Rights, 2010).
[431] Ibid.
[432] See, Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.
[433] Ibid.
[434] The Right to Food: Guide on Legislating for the Right to Food, (Rome, FAO 2009): 19-25.
[435] See, Kent, Freedom from Want, 103-115.
[436] Ibid.

ensure freedom from hunger.[437] Moreover, in the light of the fact that accessibility of food is largely a function of affordability (income), the duty to fulfill would require the State to introduce redistributive taxation and security.[438]

The duty to fulfill will be infringed given the State concerned let's people - that are most desperate and are not in a position to help themselves - starve.[439] In this regard, a violation of the duty to fulfill (provide) will occur when a State fails to ascertain the fulfillment of, at the very least, the minimum essential level as is required to be free from hunger.[440] However given the State makes the argument that it is not able to fulfill its duties in this respect due to lack of resources, it can seek international assistance in the form of aid from the international community to alleviate the problem.[441] Nevertheless, in the circumstance that a State fails to make such an appeal or deliberately delays such international appeal, it is acting in violation of its duties.[442] Accordingly, a State which makes a claim that it has been unable to fulfill its duties to provide access to food for those most vulnerable and affected due to resource constraints will have the burden of proving that it has made all efforts to use all the resources at its disposal to this end.[443] Additionally, the State concerned in this regard will be duty bound to prove that it has unsuccessfully sought to obtain international support to ensure the availability and accessibility of the necessary food.[444]

The CESCR, in its recent General Comments,[445] has added the duty to promote as an integral part of the State duty to facilitate the right to food. This duty requires a State to ensure that the right to food is taken into consideration in its public affairs and decision making processes.[446] The duty to promote moreover requires a State to ensure that there is the provision of education in relation to adequate nutrition; breastfeeding and micronutrients.[447] A good example in this regard can be the State getting involved in raising awareness on human rights among its agents as well as private actors.[448] Thus, as signatories to the ICESCR, State Parties are required to respect, protect and fulfill the right to adequate food.

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[437] Ibid, 19-22.
[438] See, Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.
[439] Ibid.
[440] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 17.
[441] See, Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 19-22.
[442]Ibid. A case in point can be Ethiopia in the 1980's where the Socialist Government as was led by Mengistu Hailemariam failed to pursue this road.
[443] This is drawn from article 2(1) of the Covenant, and its General Comment No. 3, which requires a State party to take the necessary steps to the maximum of its available resources, United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3: The Nature of State Parties' Obligations (Art. 2, Para. 1, of the Covenant)", Adopted at the Fifth Session of the Committee on Economic, Social and Cultural Rights, E/1991/23, (14 December 1990): Paragraph 10.
[444] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 17.
[445] See, Committee of Economic Social and Cultural Rights, General Comment 14 on the right to the highest attainable standard of health, and General Comment 15 on the right to water.
[446] Sollner, The Breakthrough of the Right to Food, 391-415.
[447] Ibid.
[448] The Right to Food: Guide on Legislating for the Right to Food, (Rome, FAO 2009): 19-25.

6. Extraterritorial Duty towards the Realization of the Right to Food

As the preceding discussion has already explored, it is evident that States have the primary responsibility towards meeting their obligations to the populations residing in their territory.[449] This said however, in today's globalized world, structural causes of food insecurity have dimensions that are beyond the direct control of the State.[450] This implies that it is incumbent upon States to coordinate their action with a view to meeting their obligations in an effective way.[451] The need to collaborate international efforts towards meeting ESCR in general and the right to food specifically is made an integral part of the ICESCR. For instance, Article 11 (1) of the Covenant stipulates in this regard that the "...States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international cooperation based on free consent".[452] While this provision recognizes the vital necessity of cooperation for the realization of the rights as enunciated, under sub-Article 2, the focus is given more clarity. The provision states that the States Parties by giving due recognition to the fundamental right to be free from hunger, "...shall take, individually and through international co-operation the measures that are needed towards addressing this.[453] The CESCR has provided in this regard that, "States parties should recognize the essential role of international cooperation and comply with their commitment to take joint and separate action to achieve the full realization of the right to adequate food". [454]

When it comes to the specific extraterritorial responsibilities States have towards meeting the right to food, similar to the above-explored obligations they have assumed vis-à-vis their populations, they have a duty to protect, respect and fulfill the right to food of people in other countries. According to the CESCR, the States concerned when putting into effect their commitments, "...should take steps to respect the enjoyment of the right to food in other countries, to protect that right, to facilitate access to food and to provide the necessary aid when required".[455] More specifically this means that, firstly, when a State is unable to realize

[449] The Right to Adequate Food, Fact Sheet no 34, (Geneva, FAO and the Office of the High Commissioner for Human Rights, 2010): 22-23.
[450] Ibid.
[451] Ibid.
[452] See, The United Nations General Assembly. 1966. "International Covenant on Economic, Social, and Cultural Rights." Treaty Series 999 (December): 171.: Article 11(1).
[453] Ibid, Article 11(2). More specifically, the actions to be taken by the State parties include those that are needed, "To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources" and "Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need".
[454] United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (199): Paragraph 36. Similarly, other international instruments cover the need for international cooperation, *inter alia,* Articles 22 and 28 of the United Nations General Assembly, Universal Declaration of Human Rights, December 10, 1948, 217 A (III), United Nations, Charter of the United Nations, October 24 1945, 1 UNTS XVI.: Article 1(3), and Articles 1(3), 55 and 56, The United Nations General Assembly, 1989, "Convention on the Rights of the Child", adopted 20 Nov. 1989, G.A. Res. 44/25, U.N. GAOR, 44th Sess.: Articles 4, 24 and 27., The United Nations. 2006. "Convention on the Rights of Persons with Disabilities." Treaty Series 2515 (December): 3.: Article 32.
[455] United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 36.

its duties in relation to the right to food it can seek international assistance from other States with the view to address the problems that have a cross border dimension.[456] Secondly, as part of its duty to respect, the States concerned should abstain from undertaking measures/policies that will have a negative effect on the enjoyment of the right in other countries.[457] On the other hand, while States are to refrain from undermining the right to food in other countries, this duty encompasses the forging of international assistance and cooperation so as to enable other States to meet their obligations in relation to the right to food; duty to fulfill.[458] Finally, the State concerned is duty bound to fulfill its extraterritorial obligation by taking into recognition the protection and promotion of the right to food when entering into international agreements or adopting domestic measures that will have an extraterritorial impact.[459] This is further affirmed by the CESCR in that the General Comment stresses that "States parties should, in international agreements whenever relevant, ensure that the right to adequate food is given due attention and consider the development of further international legal instruments to that end".[460] Hence, the State is expected to take into consideration its obligations under the ICESCR when it enters into international agreements in different areas. For instance, the provision of food aid should not be conducted in such a way that the interests of local producers and local markets are impacted.[461] Furthermore, the aid to be rendered should reflect the needs of the recipients and should assist the intended beneficiaries in reaching self-sufficiency. Moreover, the aid programmes should be, "safe and culturally acceptable" to the recipient population.[462] Additionally, as part of the extraterritorial duty borne by the States parties, they should respect the right to food of people living in other territories by refraining from the imposition of, "...food embargoes or similar measures which endanger conditions for food production and access to food...".[463] This responsibility is upheld with the view not to use food as an instrument for the achievement of economic and political goals.[464] Therefore, the duty assumed by states to ensure the realization of the right to food also has an extraterritorial dimension in that the State Parties to the ICESCR are to respect, protect and fulfill the right towards people living in other territories.

[456] FAO, The Right to Adequate Food, Fact Sheet 34, (Geneva, FAO and the High Commissioner for Human Rights, 2009).
[457] Ibid. See also, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2003/54, (January 10 2003): Paragraph 37.
[458] FAO, The Right to Adequate Food, Fact Sheet 34, (Geneva, FAO and the High Commissioner for Human Rights, 2009).
[459] See, for example, Human Rights Council, Report of the Special Rapporteur on the Right to Food, A/HRC/10/5/Add.2, (February 4 2009).
[460] United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 36.
[461] Ibid, Paragraph 39.
[462] Ibid. See also, Second Submission of Jean Ziegler, Special Rapporteur on the Right to Food to the Intergovernmental Working Group for the Voluntary Guidelines on the Right to Adequate Food, Paragraph 37.
[463] United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 37.
[464] Ibid.

7. Voluntary Guidelines for the Progressive Realization of the Right to Adequate Food in the Context of National Food Security

As noted above, the Voluntary Guidelines for the Progressive Realization of the Right to Adequate Food in the Context of National Food Security (hereinafter, Voluntary Guidelines)[465] is one of the soft-law international human right instruments that gives due focus on the right to food.[466] The Voluntary Guidelines were adopted by the FAO Council on 23 September 2004 in response to the call made by States and Civil Society groups[467] for a more operational tool to guide the implementation of the right to adequate food.[468] This said however, as stated in preceding sections, the seed for the development of the Voluntary Guidelines was sown[469] at the WFS-fyl in 2002.[470] Accordingly, in response to the request made by the declaration of the WFS-fyl under Article 10[471], the FAO established an Intergovernmental Working Group (IGWG) in order to elaborate on the progressive realization of the right to adequate food culminating in its adoption in 2004 by the FAO Council. This said however, the initial plan of the WFS hoped to adopt a code of conduct that would assist the objective of reducing the number of undernourished people by half in 2015. Nonetheless, due to opposition from some States,[472] this objective was short-lived consequently giving way for the adoption of a mere Guideline.[473] Consequently, in November 2004 (127th Session of the IGWG), the Guidelines were adopted unanimously by the FAO Council.[474] Thus, the full support the Voluntary Guidelines garnered from States has

[465] The Voluntary Guidelines are comprised into three sections; I. Preface and Introduction; II. Enabling Environment, Assistance and Accountability; and III. International Measures, Actions and Commitments. Section II contains 18 very specific guidelines that deal with issues ranging from good governance and the need for legislation, to food safety nets and to access to natural resources., See, The Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security, (FAO Council, 2004).

[466] See, The Right to Food: Putting it into Practice, (Rome, FAO, GTZ. 2006).

[467] The recommendation of the World Food Summit to consider the preparation of "voluntary guidelines" was carried forward in 1997 by three nongovernmental organizations or institutions - FIAN Foodfirst Information and Action Network, the World Alliance on Nutrition and Human Rights and the acques Maritain Institute.

[468] See, The Right to Food: Putting it into Practice, (Rome, FAO, GTZ. 2006).

[469] At the World Summit held in 1996 and its accompanying Plan of Action, reference was made under Objective 7(4) for, "the possibility of formulating voluntary guidelines for food security for all", Plan of Action, in FAO, Report of the World Food Summit, (Rome 13–17 November 1996), Part I (FAO, 1996).

[470] See, The Right to Food: Putting it into Practice, (Rome, FAO, GTZ. 2006).

[471] Article 10 of the WFS: fyl called on the FAO Council to establish an Intergovernmental Working Group, with the view to elaborate a set of voluntary guidelines to support Member States' efforts to achieve the progressive realization of the right to adequate food in the context of national food security., See, Declaration of the World Food Summit: Five Years Later, (FAO, 2002): Article 10, Available at, http://www.fao.org/worldfoodsummit/english/documents.htm, Accessed on 04/03/2019.

[472] The U.S. for instance opposed the move to adopt a Code of Conduct that will have a binding legal effect but preferred to keep the Guidelines in the form of soft recommendations. On the other hand, Norway was in favor of a code of conduct with firm obligations. Such a position was also favored by NGOs such as FIAN International. FAO, 2002b, Explanatory notes/reservation to the Declaration of the World Food Summit: five years later, (Rome, FAO, 2002b)., Available at, http://www.fao.org/DOCREP/MEETING/005/Y7106E/Y7106E03.htm#TopOfPage, Accessed on 04/03/2019. See also, Kent, Freedom from Want, 58-59.

[473] Ibid.

[474] FAO, The Right to Food: Putting it into Practice, (Rome, FAO, GTZ. 2006).

confirmed the fact that the political will by the State Parties to realize the right to adequate food exists.[475]

Accordingly, the Voluntary Guidelines by virtue of the guidance they render to the State Parties to progressively realize the right to adequate food, comprise of a range of issues to be considered by national governments in order to build an enabling environment for people to feed themselves in dignity.[476] They encourage Member States to the ICESCR to align their policies with the goal of ensuring food security.[477] The Guidelines establish the four pillars of food security, "availability, stability of supply, access, and utilization".[478] To this end, they provide a set of measures that serve as a basis for the implementation of the right to food at the national level.[479] Moreover, they provide appropriate safety nets for those people who are unable to do so.[480] The Guidelines furthermore provide measures aimed at holding Governments accountable to rights holders in relation to their inability to fulfill the obligations they have assumed under the ICESCR and related human rights instruments.[481] The Voluntary Guidelines furthermore encourage States to utilize the Guidelines in the development of their national strategies and programs aimed at fighting hunger and malnutrition.[482] Besides the direction they provide to States, the Guidelines encourage non-State actors, NGOs, Civil Society Organizations (hereafter, CSOs) and private sector stakeholders to strengthen the progressive realization of the right to adequate food.[483] Moreover, they assist legislators in terms of improving their legal systems as well as administrators who wish to improve government policies and monitor the performance of these policies.[484]

Even though the Voluntary Guidelines are short in terms of having a binding legal effect on the State Parties to the ICESCR, they serve as practical toolkits that assist State parties in implementing their treaty obligations, under Article 11 of the ICESCR and its General Comment.[485] Moreover, considering that when compared to hard legal obligations, a consensus can easily be formed around soft law standards;[486] such instruments have the potential to influence State behavior albeit short of a legal obligation.[487] By the same token,

[475] See, Sollner, "The Breakthrough of the Right to Food, 391-415.
[476] FAO, The Right to Adequate Food, Factsheet No. 34, (Geneva, FAO and the High Commissioner for Human Rights, 2010).
[477] FAO, The Right to Food Guidelines, Information Papers and Case Studies 72 (Rome, FAO 2006), Available at http://www.fao.org/docs/eims/upload/214344/ RtFG_Eng_draft_03.pdf, Accessed on 04/03/2019.
[478] Ibid.
[479] Ibid.
[480] Ibid.
[481] FAO, The Right to Adequate Food, Factsheet No. 34, (Geneva, FAO and the High Commissioner for Human Rights, 2010).
[482] As part of the guidance they render to States, the Guidelines show how the key human rights principles; non-discrimination, participation, transparency, accountability and access to justice, can be made part of a rights-based approach to food security. See, Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 7-9.
[483] FAO, The Right to Adequate Food, Factsheet No. 34, (Geneva, FAO and the High Commissioner for Human Rights, 2010).
[484] Ibid.
[485] Ibid.
[486] Ibid. Even before such soft law standards have developed into hard legal obligations.
[487] See, Sollner, The Breakthrough of the Right to Food, 391-415.

the Voluntary Guidelines may contribute to creating customary international law as they constitute soft law instruments that may be complied with State conduct that will be accepted under international law.[488] Additionally, the Guidelines are blueprints of the right to food, which is a legally binding right.[489] In this respect, the Voluntary Guidelines are considered groundbreaking in that they have provided an internationally accepted definition of the right to food.[490]

Hence, all facts in relation to the Voluntary Guideline have to be taken into account so as to effectively assess its legal place.[491] For this reason, although lacking a binding effect, they are important tools mainly due to their ability to translate the right to adequate food by providing recommendations for concrete actions.[492] Furthermore, they provide a vital reference for orienting national policies and programs.[493] Besides their legal place, the Guidelines are important political tools for the implementation of the right to adequate food.[494] Therefore, the adoption by FAO of the Guidelines has confirmed that there exist the political will and the solid commitment to progressively achieve the right to adequate food.[495]

[488] Ibid.
[489] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): & United Nations General Assembly, International Covenant on Civil and Political Rights, December 19 1966, United Nations Treaty Series 999, p. 171.: Article 11.
[490] See, Zeigler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 7-9. An additional aspect for considering the Voluntary Guidelines as ground- breaking has to do with the recognition given to the international dimension related to the right to food, such as questions related to international trade, food aid and embargoes.
[491] See, Sollner, "The Breakthrough of the Right to Food, 391-415.
[492] The Right to Food: Putting it into Practice, (Rome, FAO, GTZ. 2006).
[493] Ibid.
[494] See, Sollner, "The Breakthrough of the Right to Food, 391-415.
[495] Ibid. See also, Zeigler, Golay Mahon, et al., The Fight for the Right to Food: Lessons Learned, 7-9.

8. Implementation at the National level

The primary bearer of responsibility for ensuring the full realization of the right to adequate food lies with the national authorities of each State Party to the ICESCR.[496] This applies both to the obligations contained in the International Human Rights Covenants, such as the ICESCR, but also to the commitments under the WFS Plan of Action.[497] This said it is to be noted that the prevailing conditions of States are different in relation to the implementation of the right to adequate food.[498] Moreover, the modalities through which States are to ensure freedom from hunger and move progressively towards the realization of the right to food are not alike.[499] According to the General Comment provided by the CESCR[500], this implies that all State Parties have a margin of discretion in identifying and choosing their own approaches towards this end. Notwithstanding the varying conditions prevalent and the discretion they are granted, the States are however required, as per their obligations assumed under the ICESCR[501], to take all steps necessary so as to ensure freedom from hunger and to move as quickly as possible towards creating a context where everyone will be able to enjoy the right to adequate food.[502] To this end (to ensure food and nutrition security for all), as part of their obligation, the States concerned are required to adopt national strategies so as to implement at the national level, the right to adequate food.[503]

Accordingly, the national strategies to be adopted by the State Parties are to take into account, firstly, the situation for different group of people (gender, ethnicity, race, etc considerations) as well as different regions (in view of rural and urban areas) in the member country.[504] Such a mapping out will be crucial because it is instrumental in identifying the most food insecure and in response, to developing appropriate strategies to address the prevailing situation.[505] As already explored in foregoing sections, food security as a corollary to the right to food is to be ensured when all people at all times have access to the food needed for to live a healthy and active life.[506] According to the Special Rapporteur on the right to food,[507] at the national level,

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[496] The Right to Food in Theory and Practice, (Rome, FAO, 1998): 40-47.
[497] Plan of Action, in FAO, Report of the World Food Summit, (Rome 13–17 November 1996), Part I (FAO, 1996).
[498] See, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999): 17-20. Also, the United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 21.
[499] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 21.
[500] Ibid.
[501] See, United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3(1990).
[502] See, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999): 17-20.
[503] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 21.
[504] See, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999): 17-20.
[505] Ibid.
[506] Plan of Action, in FAO, Report of the World Food Summit, (Rome 13–17 November 1996), Part I (FAO, 1996).
[507] Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999): 17-20.

food security implies that "...everyone has effective entitlements to adequate food or resources for food and that there is in principle enough food to go around" whereas at the individual level it connotes, "...ensuring that sufficient food is available throughout the territory, that supplies are relatively stable and that everyone within that territory in need of food has the capacity to obtain it" so as to live a healthy life.[508] This said the *a contrario* reading of this implies that food insecurity is bound to exist in a context wherein some people, sometimes or at all times, do not have access to adequate food. Linking this explanation to the discussion in this sub-section, in the national strategies they adopt, the State parties are expected to review how people in general or specific groups are vulnerable to being the most food insecure.[509] After this task of identification is completed, the national strategy should endeavor to restore the food security for those vulnerable groups and the population as a whole. This should be followed by the formulation of policies required to this end and the identification of available resources, in order to meet the goals set.[510] As already highlighted afore, even during situations of resource constraint resulting from, *inter alia*, economic recession, and climatic conditions, the minimum core obligation, to alleviate hunger towards those most vulnerable groups and people should be prioritized via social programs, social safety nets, and international assistance.[511] Furthermore, in the national strategies to be adopted, the State Parties should endeavor to devote particular attention to prevent discrimination in access to food as well as the resources as needed for food.[512]

Besides the formulation of national strategies on the right to adequate food, in the implementation of the strategies set, the States concerned are required to "... set verifiable benchmarks for subsequent national and international monitoring".[513] To this end, the States are encouraged to "...consider the adoption of a framework law as a major instrument in the implementation of the national strategy concerning the right to food".[514] In its authoritative interpretation, the CESCR has provided the details of what should be constituted in the framework laws of the State Parties. In this regard, the respective provision states that it should include in broad terms,

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[508] Ibid.
[509] Ibid.
[510] Ibid.
[511] Ibid.
[512] The national strategy to be adopted should include, among other things, guarantees of full and equal access, particularly for women, to economic resources, including the right to inheritance and ownership of land and other property, credit, natural resources and appropriate technology; measures to respect and protect self-employment and work which provides a remuneration ensuring a decent living for wage earners and their families (as stipulated i article 7 (a) (ii) of the Covenant); maintaining registries on land rights (including forests) and fishing resources important for food production or other means of livelihood in rural areas; special legislation to protect the land rights of indigenous peoples and prevent forced evictions from their land; measures to protect or secure entitlements to land or other sources of livelihood among vulnerable smallholders, landless peasants and urban poor without discrimination as to race or ethnicity, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/Sub.2/1999/12, (June 28 1999): 17-20.
[513] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12(1999): Paragraph 29.
[514] The framework law to be adopted moreover provide the "means by which the purpose could be achieved described in broad terms, in particular the intended collaboration with civil society and the private sector and with international organizations; institutional responsibility for the process; and the national mechanisms for its monitoring, as well as possible recourse procedures". In developing the benchmarks and framework legislation, States parties should actively involve civil society organizations., General Comment 12: Paragraph 29.

"....provisions on its purpose; the targets or goals to be achieved and the time frame to be set for the achievement of those targets; the means by which the purpose could be achieved described in broad terms in developing the benchmarks and framework legislation, States parties should actively involve civil society organizations".[515]

This issue of giving the right to adequate food a legal backup in the national laws of the States concerned has also been addressed in the Voluntary Guidelines. In this regard, Guideline 7 provides that,

"States are invited to consider, in accordance with their domestic legal and policy frameworks, whether to include provisions in their domestic law, possibly including constitutional or legislative review that facilitates the progressive realization of the right to adequate food in the context of national food security".[516]

[515] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12(1999): Paragraph 29.

[516] See, Voluntary Guidelines to Support the Progressive Realization of the Right to Food in the Context of National Food Security, (FAO Council, 2004): Guideline 7.

9. Justiciability to Violations Against the Right to Adequate Food

The section below will explore whether the right to adequate food is a justiciable right that can be claimed by individuals and groups before Courts. The issue of justiciability in relation to ESCR, in general, refers to the extent to which disputes involving a particular kind of law are to be settled in the court of law or a quasi- judicial body.[517] Justiciability is about ensuring accountability[518] through adjudication (through court procedure).[519] More specifically, rights which are justiciable are those that are capable of being evoked by individuals before a court of law or a quasi- judicial body.[520] Justiciability further implies that victim of a violation shall be able to bring their (his/her) case before the judiciary to the end of finding an effective remedy to the violation that has occurred from a given State.[521]

This said however, there has been a hot debate concerning the issue of the accountability and justiciability of ESCRs.[522] In this regard, critics are of the opinion that as opposed to CPRs, ESCRs - by their very nature - are not to be addressed in courts and that they are for the most part not addressed properly in court procedures.[523] The move to consider ESCR as non-justiciable in their very nature was especially a dominant belief that prevailed during the Cold War period in some Western countries, notably the U.S.[524]

In this regard, according to the former Special Rapporteur on the right to food, Jean Ziegler, four reasons have been cited to be behind the ensuing hesitation towards this consideration in general and specifically as regards the right to food.[525] According to him, the first reason has to do with the fact that ESCRs including the right to food were considered to be imprecise.[526] Secondly, the hesitation also centered on the fact that ESCRs, as inclusive of the right to food,

[517] See, Kent, Freedom from Want, 129-132.

[518] According to scholars such as George Kent, accountability addresses a broader notion besides the current approach which focuses on "what can be described as the violations orientation to human rights work". This is because this approach gears justiciability towards addressing specific issues of direct violence, and not that of ongoing structural violence. However, wrongful actions, do not only emanate from wrongdoers but rather from structural problems as embedded in the social systems. More specifically, this connotes for example that, even though not a result of a Government's wrongdoing, national governments have a duty to address the problem of poverty, amongst their people. Hence, justiciability is to be approached as encompassing a broader issue besides the mere preoccupation with wrongful acts and wrongdoers., For more, see, Kent, Freedom from Want, 129-132.

[519] See, for example, Commission on Human Rights, Report of the Special Rapporteur on the Right to Food, E/CN.4/2002/58, (January 10, 2002): Paragraph 30.

[520] Ibid.

[521] Ibid.

[522] Christina Courtis, The Right to Food as a Justiciable Right: Challenges and Strategies, (A. Von Bagdandy and R. Wolfrum, eds.), Max Planck Year Book of International Law, Vol. 7, (2007): 317-337.

[523] See, Kent, Freedom from Want, 129-132; Dennis, Michael J., and David P. Stewart, Justiciability of Economic, Social and Cultural Rights: Should there be an International Complaints Mechanism to Adjudicate the Rights to Food, Water, Housing, and Health?, American Journal of International Law 98, No. 3 (2004): 462–515; Aryeh Neier, "Social and Economic Rights: A Critique", Human Rights Brief, Vol, 13, Issue 2, (2006); Gerald Rosenberg, The Hollow Hope: Can Courts Bring About Social Change?, (1991).

[524] In rejection to a draft resolution on the right to food, the delegation of the United States of America claimed that the proposal implied that citizens had a right to food and could seek legal remedy if this right were denied by their respective States. This means that the delegation of the United States did not consider that the right to food should be justiciable". Vienna Declaration and Programme of Action, World Conference on Human Rights, Vienna, 14–25 June 1993, A/CONF157/24, (1993): Paragraph I (5).

[525] Commission on Human Rights, Report of the Special Rapporteur on the right to food, E/CN.4/2002/58, (January 10 2002): Paragraph 34.

[526] Ibid.

are subject to the limit of progressive realization.[527] Thirdly, the caution centered on the fact that the full implementation of these rights necessitated resources to be provided by the State.[528] Lastly, absent the provision of precise national legislation on ESCR, including the right to adequate food, it was difficult for the judiciary to fill the gap that properly belonged to the legislative branch of the State.[529] On the opposite side, opponents of this view assert that rather than a difference of nature, the variation between ESCRs and that of CPRs lies in differences of degree for which reason these rights should be the subject of judicial adjudication.[530]

Notwithstanding this longstanding debate on the justiciability of ESC rights, it is important to highlight that the issue of justiciability has been among the subjects of discussion by the CESCR.[531] In this regard, according to the observation it had conducted on the domestic application of the ICESCR by the State Parties[532], Article 2(1) of the ICESCR and further elaborated in General Comment 3[533], the phrase to take steps by "...all appropriate means..." addresses three interlinked issues. On the first hand, that the rights enshrined must be implemented in the domestic legal order.[534] On the second hand, that an effective set of legal remedies must be ensured in view of those people whose rights have been violated.[535] Finally, the rights must have a juridical effect before the Court of law, implying that they must be justiciable.[536] According to the CESCR, in determining the best way to give domestic legal effect to the Covenant rights, the need to ensure justiciability is pertinent.[537]

In this vein, it is evident that the CESCR has granted the State Parties some space of national discretion, as noted, in choosing the modality for the implementation of the rights as enshrined in the ICESCR.[538] This said however, the modalities of implementation to be chosen by the State Parties, "... should be appropriate in the sense of producing results which

[527] Ibid.
[528] Ibid.
[529] Ibid.
[530] Ibid, Paragraph 29; See also, Center on Housing Right and Evictions, "Litigating Economic, Social and Cultural Rights: Acheivements, Challenges and Strategies, (COHRE, 2003).
[531] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9: The domestic application of the Covenant", Adopted at the nineteenth Session of the Committee on Economic, Social and Cultural Rights, E/C.12/1998/24, (December 3, 1998).
[532] Ibid.
[533] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990).
[534] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998); United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990).
[535] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998); United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3(1990): Paragraph 3-4.
[536] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998); United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990): paragraph 5.
[537] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998): Paragraph 7; United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990): Paragraph 5.
[538] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998).

are consistent with the full discharge..." of obligations as enshrined therein.[539] To this end, the CESCR has noted that the State Parties have used different modalities[540] in their implementation of the obligations in general, including the right to adequate food. This said, however, notwithstanding the approach taken, State Parties should ensure that the methods to be used by the States to implement the obligations should be, "...adequate to ensure the obligations under the Covenant".[541] Under this milieu, the State Parties in determining the best modality in giving legal effect to the obligations assumed should ensure justiciability.[542]

Here, the CESCR has stressed that when compared with Article 2(3) (b) of the ICCPR[543] under which the States concerned are duty bound to provide an effective legal remedy for the violation of rights that may have occurred, the ICESCR has no equitable provisions.[544] Nonetheless, an expansive interpretation of Article 2(1) of the ICESCR would imply "...the provision of judicial remedies with respect to rights which may, in accordance with the national law, be considered justiciable".[545] In this context, a State that has failed short of providing such legal remedies has a burden of proof to ensure they are not the most appropriate or necessary means.[546] For the CESCR, an effective remedy that is to be used in this vein does not only constitute that of a judiciary means but administrative remedies might also serve as effective remedies to the extent that they are "...accessible, affordable, timely and effective".[547] Therefore, in consideration of all these issues and as provided by the

[539] Ibid, Paragraph 5.

[540] According to its observation, the CESCR has concluded in its General Comment that at the national level, while some States did not do anything to implement the Covenant, others have gone as far as adjusting their domestic legislation to implement the Covenant, albeit failing short in invoking the specific treaty Provisions. The remainder of States did incorporate the ICESCR in their domestic law while "giving formal validity to the obligations as enshrined in the respective national legal orders. The last two approaches presented represent, a dualistic and a monistic approaches used towards giving legal effect to international law in the domestic legal order. For the CESCR, the monistic approach is preferable due for the fact that the procedure of direct incorporation will eliminate the problems that are due to arise in the process of translation of treaty obligations into national law. Moreover, direct incorporation is relevant because it allows for direct invocation of the rights enshrined by individuals in the ICESCR before national courts., See, United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9: The domestic application of the Covenant", Adopted at the nineteenth Session of the Committee on Economic, Social and Cultural Rights, E/C.12/1998/24, (December 3, 1998): Paragraph 6; F.W. Wernaart, The Enforceability of the Human Right to Adequate Food: A Comparative Study, (Wageningen University 2013).

[541] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9(1998): Paragraph 7; United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990): Paragraph 5.

[542] Justiciability, which implies that a matter can be properly resolved by a Court, is to be differentiated form self-executing, meaning that a Provision can be applied by a Court without further elaboration., United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998): Paragraph 10.

[543] United Nations General Assembly, International Covenant on Civil and Political Rights, December 16 1966, United Nations Treaty Series, Vol. 999, P. 171.: Article 2(3)(b).

[544] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998): Paragraph 3; United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990); International Covenant on Civil and Political Rights, 19 December 1966, 999 UNTS 171, Can TS 1976 No 47 (entered into force 23 March 1976) [ICCPR]: Article 2(3), and UDHR: Article 8. E/C.12/1998/24, 3 December.

[545] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998): Paragraph 3.

[546] Ibid.

[547] For the CESCR, even though administrative remedies can be effective remedies, the Committee favors the possibility to finally appeal before a Court. See, United Nations Committee on Economic, Social and Cultural

CECSR[548], the inclination to consider ESCR as non-justiciable when compared with CPRS will be contrary to the principles of interdependence and indivisibility as enshrined in the Vienna Declaration and Programme of Action.[549]

With the view of giving legal effect to the right to adequate food, and as recommended by the Right to Food Guidelines 7(2)[550], States Parties have incorporated in their constitutions provisions on the right to food.[551] Such due recognition given implies that the State Parties are bound by a set of obligations, already discussed above, as enshrined in the ICESCR in relation to the right to food and that in those situations where they fail to meet their obligations, that they will be held accountable.[552] This necessitates that each policy or action taken by all branches of government need to be in tune with the constitution, whereas the actions deemed to be unconstitutional will need to be "...annulled, disapplied or adapted immediately".[553]

Furthermore, such a constitutional recognition opens the avenue for a trickledown effect to take place; i.e., from that of a constitutional right to the national laws, the policies and strategies, and to the program level.[554] In this context, in order to ensure their primary responsibility, to date 30 countries, have enshrined the right to adequate food, or at least the responsibility ensuing on the State in this regard, in their national Constitutions.[555] This shows that there is currently a lag in terms of the adoption of national legislation towards the implementation of this right.[556] Notwithstanding this, however, according to the CESCR, domestic incorporation of international instruments recognizing the right to food is important

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Rights (CESCR), "General Comment No. 3 (1990); United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998).

[548] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (1998): Paragraph 10.

[549] Vienna Declaration and Programme of Action, World Conference on Human Rights, Vienna, A/CONF157/24, (12 July 1993).: Article I (5).

[550] The Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security, (FAO Council, 2004).: Guideline 7(2).

[551] For more, see, *inter alia*, the constitutions of the Belarus (Art. 21), Bolivia (Art. 16), Brazil (Art. 6, 7, 227), Democratic Republic of Congo (Art. 34), Cuba (Art. 9), Costa Rica (Art. 82), Colombia (Art. 43, 44, 46), Dominican Republic (Art. 57), Ecuador (Art. 19), Egypt (Art. 79 and 80), Haiti (Art. 22), Nicaragua (Art. 63), South Africa (Art. 27), Uganda (Art. 14) and Ukraine (Art. 48) that recognize explicitly the right to adequate food as enshrined ICESCR. Moreover, the constitutions of Bangladesh (Art. 15), Ethiopia (Art. 90), Guatemala (Art. 99), India (Art. 47), the Islamic Republic of Iran (Arts. 3 & 43), Malawi (Art. 13), Nigeria (Art. 16), Pakistan (Art. 38), Seychelles (Preamble) and Sri Lanka (Art. 27), have set the achievement of these goals as responsibilities of the state, to be accessed from, http://www.fao.org/right-to-food-around-the-globe/level-of-recognition/en, Accessed on, 06/03/2019.

[552] See, Realizing the Right to Food: Legal Strategies and Approaches, (Rome, Italy, International Development Law Organization 2014); Wernaart, The Enforceability of the Human Right to Adequate Food.

[553] Special Rapporteur on The Right to Food, Olivier de Schutter, Countries Tackling Hunger with a Right to Food Approach, Briefing Note 01, 2010, Human Right Council.

[554] Ibid.

[555] To date, only 30 out of 198 Constitutions in the world explicitly establish the right to food. These countries include, Brazil, Belarus, Bolivia, Colombia, Congo, Costa Rica, Cuba, Czech Republic, Ecuador, Dominican Republic, Guatemala, Guyana, Haiti, Honduras, Iran, Italy, The Democratic People's Republic of Korea (North Korea), Mexico, Moldova, Nepal, Nigeria, Panama, Paraguay, Seychelles, Sierra Leone, South Africa, Suriname, Switzerland, Uganda, and Ukraine., See, http://www.fao.org/right-to-food-around-the-globe/level-of-recognition/en, Accessed on, 06/03/2019. See also, Ying Chen, Trade, Food Security, and Human Rights The Rules for International Trade in Agricultural Products and the Evolving World Food Crisis, (England, Ashgate, 2014); The Right to Food in Theory and Practice, (Rome, FAO 1998).

[556] The Right to Food in Theory and Practice, (Rome, FAO 1998).

because it "...can significantly enhance the scope and effectiveness of remedial measures…".[557] Thus, such incorporation of international instruments is going to empower Courts to "...adjudicate violations of the core content of the right to food by direct reference to obligations under the Covenant".[558]

This point is further affirmed by the CESCR in its General Comment on the right to adequate food[559] as it requires the State Parties to ensure that,

> "Any person or group who is a victim of a violation of the right to adequate food should have **access to effective judicial or other appropriate remedies at both national and international levels**. Moreover, **victims of such violations should be entitled an adequate reparation, in the form of restitution, compensation, satisfaction or guarantees of non-repetition** …" (emphasis added).

The right to adequate food as enshrined under Article 11 of the ICESCR, as already noted, granted the State Parties a margin of discretion in choosing the modality of implementation at the national level.[560] This said however, the CESCR in its General Comment requires that even though the discretion is given to the States concerned to ensure the right to adequate food, all State Parties are required to take all steps as are necessary with the view to ensure that everyone is free from hunger and can enjoy the right to adequate food as soon as possible.[561] In addition to such steps, the CESCR affirms that when it comes to the specific context of the right to food, the requirement of "effective judicial or other appropriate remedies", and stresses that victims of a violation of the right should be entitled to "adequate reparation".[562] This said, however, the CESCR is cautious in going as far as considering the right as self-executing.[563]

In addition to the due recognition given by the CESCR to the need to ensure the justiciability of violations related to ESCRs including the right to adequate food, a close inspection into the reports prepared by the Special Rapporteur on the right to food[564] reveals that the right to food is a justiciable right. As a case in point, for instance, Jean Ziegler[565] has noted that

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[557] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 33.
[558] Ibid.
[559] Ibid, Paragraph 32. The CESCR moreover provides that National Ombudsmen and human rights commissions should address violations of the right to food.
[560] Ibid, Paragraph 21.
[561] Ibid.
[562] Ibid, Paragraph 32.
[563] Self-executing, meaning that a provision can be applied by a Court without further elaboration. See also, United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 9 (19998): Paragraph 10; The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 32.
[564] The former Special Rapporteur on the Right to Food, Olivier de Schutter, has also confirmed that the right to food should be a justiciable right, and has argued to this end that States should adopt a framework legislation in order to ensure the justiciability of the right to food before national Courts or that other forms of redress as are available., Human Rights Council, Report of the Special Rapporteur on the right to food, A/HRC/9/23, (September 8 2008): Section 18.
[565] Commission on Human Rights, Report of the Special Rapporteur on the right to food, E/CN.4/2002/58, (January 10 2002): Paragraph 30.

"...achieving justiciability of the right to food is a prime objective of the Special Rapporteur"[566] hence strongly confirming that the right to food is a justiciable right.

Therefore, aided by the increasing national recognition and protection of the right to food as well as expanding understanding of ESCRs,[567] the justiciability of the right to adequate food is being affirmed.[568] Hence, when compared to previous years wherein only a small number of courts had remedied violations of the right to food, currently, progress can be witnessed from several cases as brought before national and regional courts.[569] Interestingly, the cases have been brought before courts not only by the respective rights holders but also by civil society as well as NGOs, who have strategically employed litigation along with greater advocacy work.[570]

As an illustrative case in point, the Nigerian experience can be cited. The African Commission Human and Peoples Rights (ACHPRCom) had to consider the question of whether or not the then military government of Nigeria had, through action and inaction, violated the rights of the indigenous Ogoni community living in the Southeast of Nigeria? The Court in its final ruling held that even though the right to food is not explicitly enshrined in the African Charter on People's and Human Rights, that this right was implicit for many other rights (such as the right to life, health and to economic, social, and cultural development), for which reason it found the Nigerian government to be in violation of the right to food of Ogoni communities by destroying their food sources through its security forces and State Oil Company.[571] Hence, the Court ruled that "...the Government has not taken such steps as would be necessary to protect the Ogoni population from harms done by the NNPC-Shell consortium".[572] To this end, the Court has recommended the Nigerian government to adopt several measures, such as compensation and cleanups of polluted or damaged lands and rivers.[573] Hence, the ACHPRCom has stressed that the activities of a consortium constituted by the State Petroleum Company and Shell Oil, violated the obligation to protect the right of food of the Ogoni people.[574]

As an additional example of a National case law, can be cited Nepal. This is because, in 2010, Nepal's Court passed a landmark decision which was a response to a public interest petition

[566] Ibid.
[567] See for example, Ex parte Chairperson of the Constitutional Assembly: in Certification of the Constitution of the Republic of South Africa 1996 (First Certification judgment) 1996 (4) SA 744 (CC), Paragraph 77 - 78.
[568] Civil Society Synthesis Paper, 10 Year of the Right to Food Guidelines: Progress Obstacles and Way Ahead, 41st Session of the UN Committee on World Food Security. (2014)
[569] See also, People's Union for Civil Liberties vs Union of India and others, Writ Petition [Civil] No. 196 of 2001. See also, Grootboom and others v. Government of the Republic of South Africa and others. Case No. CCT 11/00, decision of 4 October 2000.
[570] Courtis, The Right to Food as a Justiciable Right, 317-337; Nadia Lambek & Claire Debuquois, "National Courts and the Right to Food", In Encyclopedia of Food and Agricultural Ethics (Paul Thompson et al., eds., 2014), (Berlin, Springer Verlad 2014); Christophe Golay, The Right to Food and Access to Justice: Examples at the National, Regional and International Level FAO (2011).
[571] ACHPRCom, Social and Economic Rights Action Center (SERAC), Center for Economic and Social Rights v. Nigeria, 2001.
[572] Ibid, paragraphs 65-66.
[573] Ibid, paragraph 49
[574] Ibid, paragraphs 65-66.

involving the enforcement of the State's right to food obligations.[575] The Court upheld that Nepal was bound by international human rights law for which reason the relevant treaties obliged the State to take positive steps to ensure the right to food of its population.[576] A similar national case in this context took place in Uganda in 2013.[577] In this case, the High Court of Kampala found that the government has violated its obligation to respect and protect the right to food by failing to prevent the expulsion of close to 2,041 subsistence farmers from their homes and farms for the sake of lease agreement with a foreign corporation.[578]

In addition to the progress being witnessed in the justiciability of violations with respect to the right to food through cases as brought before national and regional courts, the adoption of the Optional Protocol to the CESCR (hereafter, OP-ICESCR)[579] by the CESCR has contributed a significant fare share in assuring the justiciability of claims at the international level regarding alleged violations of the ICESCR.[580] The adoption of the OP-ICESCR has given impetus for the progress achieved regarding the justiciability of ESCR in general including the opportunity it has provided for the global enforcement of the right to food through adjudication.[581] This is especially the case for the countries that have adopted the Optional Protocol[582] as such allowing the CESCR to be an adjudicative body of last resort for holding governments accountable for rights violations.[583] The Protocol, which was adopted in 2008 (and came into force on May 5th 2013) has been hailed as "...potentially one of the most important developments in human rights protection at the UN level".[584] It has established an individual complaints procedure so that individuals can bring claims regarding rights violations.[585] This said, the OP-ICESCR is meant to only complement national legal systems

[575] Biraj Patnaik, Right to Adequate Food in Asia: Progress and Challenges, Unpublished 10th Anniversary of the RtAF Guidelines (2014).
[576] Ibid.
[577] Baleke Kayira Peter & four others vs. 1. Attorney General, 2. Kaweri Coffee Plantation Ltd., H.C.C.S. No. 179/2002 (Uganda).
[578] Ibid; Grootboom and others v. Government of the Republic of South Africa and others. Case No. CCT 11/00, decision of 4 October 2000, South Africa, Constitutional Court, Khosa and Others v. Minister of Social Development and Others, 2004; Federal Supreme Court, V. gegen Einwohnergemeinde X. und Regierungsrat des Kantons Bern, 1995.
[579] United Nations General Assembly, "Optional Protocol to the International Covenant on Economic, Social and Cultural Rights", Resolution Adopted by the General Assembly, A/RES/63/117, (March 5 2009), entered into Force May 5, 2013.
[580] Irene Biglino and Christophe Golay, The Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, Academy In-Brief, No. 2 (Geneva, Geneva Academy of International Humanitarian Law and Human Rights, 2013).
[581] Civil Society Synthesis Paper, 10 Year of the Right to Food Guidelines: Progress Obstacles and Way Ahead, 41st Session of the UN Committee on World Food Security. (2014)
[582] As of 14/02/2018, 24 Countries have adopted the Optional Protocol with the latest ratifications having been made by, Uruguay, and Honduras, For more, Available at, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-3-a&chapter=4&lang=en, Accessed on 01/03/2019.
[583] Civil Society Synthesis Paper, "10 Year of the Right to Food Guidelines: Progress Obstacles and Way Ahead, 41st Session of the UN Committee on World Food Security. (2014)
[584] International NGO Coalition for an Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, "Celebration of the Entry into Force of the OP-ICESCR", 2013. United Nations General Assembly, "Optional Protocol to the International Covenant on Economic, Social and Cultural Rights", Resolution Adopted by the General Assembly, A/RES/63/117, (March 5, 2009).
[585] United Nations General Assembly, "Optional Protocol to the International Covenant on Economic, Social and Cultural Rights: resolution", (March 5 2009).

and not to serve as a primary modality for lodging claims.[586] As such, individuals or groups of individuals under the jurisdiction of a State Party are now granted the right to submit communications about alleged violations of any ESCRs to the CESCR.[587] Accordingly, given that individuals involved in communication are under the jurisdiction of a State which has caused the violation and that the State has ratified the ICESCR and the Optional Protocol,[588] communications can be submitted.[589] This implies that, in order for such communications to be admissible, victims of violations are entitled in making appeals through an international mechanism, after having exhausted domestic remedies or there is an excessive delay in processing their claims through national procedures.[590] The OP-ICESCR also provides for interim measures for victims in exceptional circumstances in order to prevent irreparable damage to victims.[591] The adoption and entry into force of the OP-ICESCR by the ECSR has hence marked a monumental achievement in that, contrary to the past hesitation, it has brought to the limelight the fact that the right to food is a justiciable right that can be claimed at the international level.[592] In this regard, the current Special Rapporteur on the Right to Food, Hilal Elver[593] also confirms this point by asserting that the OP-ICESCR will be instrumental in ensuring the implementation of the right to food at the national as well as international level because "...the right to food is now a right that can be legitimately claimed".[594]

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[586] Ibid, Article 2.
[587] Ibid.
[588] As of October 2018, the Optional Protocol has 45 signatories and 24 State Parties. When this is compared with the 115 parties to the Optional Protocol to the International Covenant on Civil and Political Rights, shows that there is a reluctance by the State Parties to the ICESCR to recognize the right to food and to constitutionalize it as a basic right with justiciable effect, See, United Nations Treaty Collection, Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, Available at, https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=IV-3-a&chapter=4&clang=_en, Accessed on, 04/03/2019. See also, Report of the Special Rappaurteur on the Right to Food, Hilal Elver, Access to Justice and the Right to Food: The Way Forward, (Human Rights Council, 2014), A/HRC/28/65.
[589] United Nations General Assembly, "Optional Protocol to the International Covenant on Economic, Social and Cultural Rights " (March 5 2009): Article 2. See also, International NGO Coalition for an Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, "Celebration of the Entry into Force of the OP-ICESCR", (2013).
[590] UN General Assembly, "Optional Protocol to the International Covenant on Economic, Social and Cultural Rights: Resolution", (March 5 2009): Article 3. A communication will be inadmissible given, it is already being examined by another procedure of international investigation or settlement, if the Committee has already examined the same matter, facts involved in the case are the subject of the communication occurred prior to the entry into force of the Protocol for the State Party concerned unless those facts continued after that date; when the violation is incompatible with the provisions of the Covenant and is manifestly ill-founded, and when it is not sufficiently substantiated or exclusively based on reports disseminated by mass media; or when the communication is anonymous or not in writing.
[591] UN General Assembly, "Optional Protocol to the International Covenant on Economic, Social and Cultural Rights: Resolution", (March 5 2009): Article 5. See also, International NGO Coalition for an Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, "Celebration of the Entry into Force of the OP-ICESCR", 2013.
[592] Human Rights Council, Report of the Special Rappaurteur on the Right to Food, Access to Justice and the Right to Food: The Way Forward, A/HRC/28/65, (January 14, 2014)
[593] Ibid. This said however, the current Special Rapporteur stresses that there are obstacles that threaten to put restrictions on the justiciablity of the right to food. She cites, lack of political will, lack of awareness and obstacles to right holders, and institutional and structural barriers, as possible challenges.
[594] Ibid.

As this sub-section has tried to unveil, there is a growing legislative as well as judicial progress in different countries which have been salient in confirming the justiciability of the right to food. In this regard, the adoption of the OP-ICESCR has been a noteworthy step in ensuring the implementation of the right to food at the national and international level.[595]

[595] See for example, Jose Luis Vivero Pol, "Hunger for Justice in Latin America: The Justiciability of Social Rights in Hungry Democracies" (2011).

10. The Right of Everyone to Enjoy the Benefits of Scientific Progress

The second focal point of analysis for this research relates to the right of everyone to enjoy the benefits arising out of scientific progress (hereinafter, the right to science) as enshrined in international human rights documents. This section will be paramaount for the forthcoming disscusions that assess the role of scientfic progress for the realization of the right to food. Hence, the discussion below will expound the right science by exploring its legal basis under international law, its conception in relation to other human rights both in the past and at present, and the possible State duties that are to be derived towards its full realization.

The right to science has been enshrined in international human rights documents since the late 1940s. This is because Article 27(1) of the UDHR enumerates the right of everyone "...to participate in the cultural life of the community, **to enjoy the arts and to share in scientific advancement and its benefits**"[596] (emphasis added). When this article is read in conjunction with Article 1 of the UDHR[597] and considering that these "inalienable rights"[598] originate from "the inherent dignity of the human person"[599], it entails that everyone is entitled to the rights set forth in the declaration without discrimination,[600] so as to access cultural and scientific knowledge.[601]

In addition to its stipulation in the UDHR, the provision has been made an integral part of the ICESCR as per Article 15(1) (b)[602], as such conferring binding legal obligations on the State Parties. The provision specifically enumerates that the States Parties to the ICESCR recognize the right of everyone, "To enjoy the benefits of scientific progress and its applications".[603] The implication of its incorporation in the ICESCR is that similar to the responsibilities they have assumed in relation to, for instance, freedom of thought, conscience, religion,[604] and due process,[605] States Parties are expected to respect the rights to science.[606] In this respect, the obligation on State Parties towards meeting the right to science extends, similar to other

[596] United Nations General Assembly, Universal Declaration of Human Rights, (December 10, 1948): Article 27(1). "The Universal Declaration and the subsequent international human rights instruments derived from it were motivated in large part by the genocidal practices of the Nazis, some of which involved the misuse of science". See also, Audrey R. Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", Journal of Human Rights, 8:1, (2009): 1-36, DOI: 10.1080/14754830802701200.
[597] United Nations General Assembly, Universal Declaration of Human Rights, (December 10, 1948): Article 1. The article provides that "All human beings are born free and equal in dignity and rights"
[598] United Nations General Assembly, Universal Declaration of Human Rights, (December 10, 19488): Preamble.
[599] Ibid.
[600] Ibid, Article 2.
[601] See, Sebastian Porsdam, Mann, Helle Porsdam, Christine Mitchell & Yvonne Donders, "The Human Right to Enjoy the Benefits of the Progress of Science and Its Applications", The American Journal of Bioethics, 17:10, (2017), 34-36, DOI:10.1080/15265161.2017.1365194
[602] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights" (1966): Article 15(1) (b).
[603] Ibid.
[604] United Nations General Assembly, Optional Protocol to the International Covenant on Civil and Political Rights, December 19, 1996, United Nations Treaty Series, vol. 999, p. 171.: Article 18.
[605] Ibid, Article 14.
[606] Sebastian Porsdam, Yvonne Donders, C. Mitchelle, et al., "Advocating for Science as a Human Right", Vol. 115, No. 43., PNAS (2018.)

human rights, to States that have not signed the ICESCR.[607] For instance, the United States has only signed the ICESCR in 1977 however falling short of ratification.[608] Notwithstanding this, the country is still obliged to refrain from undertaking acts that would defeat the object and purpose of the ICESCR.[609]

In both international human right documents, the right to science has been stipulated along with the right to take part in cultural life[610] and right to benefit from "...the protection of the moral and material interests resulting from any scientific, literary or artistic production...".[611] This enunciation of the right to science alongside these human rights is not accidental. This is because firstly, a thorough reading into Articles 15(b) and (c) of the ICESCR reveals that the right of everyone to benefit from the creativity of others is to be ensured while protecting the moral and material interests emanating from "...any scientific, literary or artistic production".[612] The CESCR has highlighted this point in its General Comment on Article 15(1)(c) of the ICESCR by stressing that this right is meant not only to encourage the active contribution of creators to the arts and sciences but also "...to the progress of society as a whole".[613] This is because, according to the CESCR, the protection of innovators is intrinsically linked to other human rights, such as the right to take part in cultural life and the right to science.[614] Secondly, in relation to the link made between the right to science and cultural participation, the Special Rapporteur in the field of cultural rights, maintains that both rights are inherently interlinked.[615] This is because, for instance, both rights relate to "…the pursuit of knowledge and understanding and to human creativity in a constantly changing

[607] United Nations, Vienna Convention on the law of Treaties, May 23, 1969, United nations, treaty Series, Vol. 1155, P. 331.: Article 19(c).
[608] The Covenant was signed by President Jimmy Carter in 1977. Since then no steps have been taken towards ratification. See also, Piccard, Ann, The United States' Failure to Ratify the International Covenant on Economic, Social and Cultural Rights: Must the Poor Be Always with Us?, St. Mary's Law Review on Minority Issues, Vol. 13, No. 2, (2010).
[609] United Nations, Vienna Convention on the law of Treaties, (May 23, 1969): Article 19(c).
[610] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights." (1966): Article 15(1)(a). See also, the United Nations General Assembly, Universal Declaration of Human Rights, (December 10, 1948): Article 27 (1). The Special Rapporteur in the Field of Cultural Rights, considers the right to science and that of culture as inherently interlinked, since both, "relate to the pursuit of knowledge and understanding and to human creativity in a constantly changing world", Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 16-20, See also, Lea Shaver, "The Right to Science and Culture", Wisconsin Law Review, No. 121, (2010); Lea Shaver, "The Right to Science: Ensuring that Everyone Benefits from Scientific and Technological Progress", European Journal of Human Rights 2015/4, (2015): 411-430. http://dx.doi.org/10.2139/ssrn.2564222
[611] United Nations General Assembly, Universal Declaration of Human Rights, (December 10, 1948): Article 27 (2); The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights." (1966): Article 15 (1) (c).
[612] The Human Right to Science: New Directions for Human Rights in Science, Presentation Prepared by Farida Saheed, May 22, 2015, (Bern, Switzerland).
[613] United Nations Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 17: The Right of Everyone to Benefit from the Protection of the Moral and Material Interests Resulting from any Scientific, Literary or Artistic Production of which He or She is the Author (Article 15, Para. 1(c)) of the Covenant, January 12 2006, E/C.12/GC/17.: Paragraph 4.
[614] United Nations Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 17 (2006): Paragraph 4.
[615] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).: Paragraph 3, 16-19.

world".[616] Therefore, in due consideration of these issues, the right to science has been presented in the ICESCR as part of cultural participation and the protection of intellectual property.[617]

In this regard, according to the Venice Statement[618], besides the link that has been made with the right to cultural participation and the right of authors, including those rights in which reference to the accessibility of science and technology is made[619], the right to science is inextricably is also linked to other human rights. As such, this implies that the right to science aside from its value as a human right serves as a cross-cutting principle which is instrumental for the implementation of other ESC rights.[620] For instance, the right to science is to be linked with, for example, the right to a clean environment, education, information, labor rights, social security, sustainable development, and, water, where access to science is made an implicit requirement for their full enjoyment.[621] Aside from these international human rights documents, reference has also been made to the right to science in regional human right instruments.[622]

The articulation of the right to science in the ICESCR, as already noted, puts a binding legal obligation on the State Parties, towards the realization of the right. In this vein, the provision enumerates the specific steps that are to be taken by the States towards this end.[623] Accordingly, the steps that are to be taken by the States Parties in order to fully realize the rights enshrined under Article 15(2), include "...those necessary for the conservation, the development and the diffusion of science and culture".[624] Furthermore, this enumeration of the right to science in the ICESCR goes a step further in underscoring the ensuing State obligations to this end. The article provides that the States Parties to the Covenant "...undertake to respect the freedom indispensable for scientific research and creative

[616] Ibid, Paragraph 17.
[617] Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1-36.
[618] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009). The Venice Statement was published in 2009 as part of the United Nations Educational, Scientific and Cultural Organization's (UNESCO) effort to define and discuss the right to science as included in UDHR and ICESCR.
[619] Such a link has been made for instance under Article 11 and 12 of the ICESCR in relation to the right to food and the right to health. See, The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Article 11 and 12.
[620] Amrei Muller, "Remarks on the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (Article 15(1)(b) ICESCR)", Human Rights Law Review, Volume 10, Issue 4, 1 December (2010): 765 784, https://doi.org/10.1093/hrlr/ngq033.
[621] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009).
[622] For more, see, Organization of the Islamic Conference (OIC), Cairo Declaration on Human Rights in Islam, 5 August 1990. Organization of American States (OAS): Article 42; Additional protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, ("Protocol of San Salvador"), 16 November, A-52: Article 14; African Union, Protocol tot eh African Charter on Human and People's Rights on the Right of Women in Africa, (July 11, 203): Article 4 (1) (h) and 12 (2) (b); European Union, Charter of Fundamental Rights of the European Union, (October 26, 2012), 2012/C 326/02.: Article 13.
[623] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Article 15 (1) (2).
[624] Ibid.

activity".[625] Additionally, the provision calls upon States to be cognizant of "...the benefits that are to be derived from the encouragement and development of international contacts and co-operation in the scientific and cultural fields".[626] As such, a close inspection into the *Travaux Préparatoires* of Article 15(1)(b) ICESCR and Article 27(1) of the UDHR reveals that there was a broad consensus and strong support among the State parties for the inclusion of the right to science in both human rights instruments.[627]

Nonetheless, in spite of this due recognition given to the right to science in such international human right documents, the scope, normative contents, and obligations of States arising thereof remain "...underdeveloped while scientific innovations are changing human existence in ways that were inconceivable a few decades ago".[628] This is because a multiplicity of discussions conducted thus far have focused either on the benefits or possible adverse effects of science rather than the consideration of science as a substantive human right.[629] Hence, for a long time, science has been defined and approached either as a tool for the realization of other human rights or in terms of its negative impact on the realization of the same.[630] For instance, during the drafting of the ICESCR in the 1950s, the relationship between science and human rights was conceived positively.[631] This consideration, however, had changed in the 1970s as science came to be approached in terms of its negative effects on human rights.[632] During the time, in an attempt to rectify this consideration, the United Nation Educational, Scientific and Cultural Organization (hereafter, UNESCO), undertook the initiative to draft a "Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for the Benefit of Mankind"[633] which was adopted by the General

[625] Ibid, Article 15 (1) (3).
[626] Ibid, Article 15 (1) (4).
[627] See, Maria Green, "Drafting History of the Article 15(1)(c) of the International Covenant on Economic, Social and Cultural Rights", Background Paper Submitted for the CESCR's Day of General Discussion on Article 15(1)(c) ICESCR, 27 November 2000, E/C.12/2000/15: Paragraph 4, 19 and 34; William A. Schabas, "Study of the Right to Enjoy the Benefits of Scientific and Technological Progress and Its Applications", in Yvonne Donders and Veladmir. Volodin (eds), Human Rights in Education, Science and Culture: Legal Developments and Challenges, (Ashgate, Aldershot: 2008): 273.
[628] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012); Shaver, "The Right to Science: Ensuring that Everyone Benefits from Scientific and Technological Progress", 411-430.
[629] Yvonne Donders, "The Right to Enjoy the Benefits of Scientific Progress: In Search of State Obligations in Relation to Health", Medicine, Health Care and Philosophy 14, No 4, (2011); Report of the International Bioethics Committee of UNESCO (IBC) on Social Responsibility and Health, UNESCO Doc. SHS/EST/CIB 10-11/1, 2010; Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1-36.
[630] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012); Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1-36.
[631] Haugen Hans Morten, "Human rights and technology: A Conflictual Relationship? Assessing Private Research and the Right to Adequate Food", Journal of Human Rights, 7, (2008): 224-244.
[632] With due consideration to this, for example, the Secretary-General of the United Nations including the staff of several specialized agencies were engaged in the preparation of various substantive reports on scientific developments and their impact on human rights for presentation to the General Assembly and the Commission on Human Rights. See, Richard Pierre Claude, "Scientists' Rights and the Human Right to the Benefits of Science", in Core Obligations: Building a Framework for Economic, Social and Cultural Rights, (Audrey R. Chapman and Sage Russell. eds.) (Intersentia, Antwerp and Oxford, 2002b): 247–278.
[633] Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for The Benefit of mankind. (1975) General Assembly Resolution 3384 (XXX).

Assembly. This declaration portrayed science as a resource to promote the realization of human rights and fundamental freedoms[634] however cautioning that science should not be used to the determinant of human rights as well as fundamental freedoms.[635] As such, science has been approached as an avenue to realize human rights or as a detriment for the realization of the same.[636]

In addition to the two-sided consideration of science as an avenue and threat to the realization of human rights, the progress towards a clear understanding of science has been restrained by the fact that so far modest legal as well as academic work has been done towards its conceptualization.[637] This has made human rights scholars such as Audrey Chapman conclude that,

> "This right is so obscure and its interpretation neglected that the overwhelming majority of human rights advocates, governments, and international human rights bodies appear to be oblivious to its existence".[638]

This has taken place because, according to the Special Rapporteur in the Field of Cultural Rights, the approach taken thus far considers the right to science either as a vehicle to advance the realization of other human rights[639] with a view to address "...the needs common to all humanity"[640] or on the opposite side in relation to, "potentially adverse consequences for the integrity, dignity and human rights of the individual".[641] Therefore, according to her, we need to move beyond this truism towards considering the right to science as a right in and of itself.[642]

The CESCR has not adopted a General Comment by making use of the two mechanisms it usually employs; it has not held a day of general discussion with experts and members of the human rights community nor has it drafted a General Comment setting forth the interpretation of the right.[643] This said, however, currently the CESCR is in the process of drafting a General Comment on the right to science with the view to provide clarity to its core contents and

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[634] Ibid, Article 7.
[635] Ibid, Article 8.
[636] Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1-36.
[637] Shaver, "The Right to Science and Culture", 126-127.
[638] Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1-36.
[639] The right to science is sometimes considered and presented as a prerequisite for the realization of other human rights, *inter alia*, the right to food, rights to health, water, housing and education, as well as the right to development and the emerging right to a clean and healthy environment, See, Olivier De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food: From Conflict to Complementarity", Human Rights Quarterly, vol. 33, No. 2, (2011): 304-350; Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).
[640] Declaration on Social Progress and Development, General Assembly resolution 2542 (XXIV): Preamble.
[641] Vienna Declaration and Programme of Action, World Conference on Human Rights, (Vienna, June 1993).
[642] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012); Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food: From Conflict to Complementarity", 304-350.
[643] Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1-36.

ensuing State duties.[644] To this end, it has called for the participation of interested scientists.[645] Cognizant of this progress, the following section will assess the right to science based mainly on scholarly work that has been carried out on its normative contents as well as ensuring State obligations. The discussion below will examine the nature of the relationship which currently exists between scientific endeavors and that of human rights.

[644] Porsdam, Donders, Mitchelle, et al., "Advocating for Science as a Human Right".
[645] Ibid.

10.1. The Need to Focus on Science and Human Rights Today

The growth and acceleration of scientific production of knowledge - scientific innovations - especially in the context of globalization has hastened the effects on human rights in both positive and negative ways.[646] This conclusion is to be drawn for instance, in the area of food production. In this regard, even though the instrumentality of scientific advancements, in terms of, for instance, boosting crop yields, cannot be denied, such advancements may also reduce crop genetic diversity, widen the gap between poor farmers and large-scale producers, and thus affect the realization of the right to food.[647] This one-sided consideration of science as a vehicle for the realization of human rights, has furthermore, exposed the disparities existent between States in relation to resource availability, capability as well as infrastructure in order to engage in research and development.[648] Thus, such acceleration of scientific progress has growingly widened the divide between societies into most and least technologically advanced.[649] Consequently, as an upshot of this divide, the question of access to scientific advancements has become a critical concern. The underlying factor for this has been that there are major inequalities among States in the development as well as diffusion of technologies.[650] This relates to the fact that scientific advancements (research, invention, innovation, and product development) are mainly concentrated in high-income OECD counties and at a lower level, middle-income countries to be found in Asia and Latin America.[651] In spite of the noteworthy value such technological advances have in being instruments of human progress, they have not been evenly distributed due to the limits of income, infrastructure, and institutions.[652]

As will be explored further in this research, the consequence of this has been that such lack of access to scientific advancements has threatened the enjoyment of human rights, "...including the ability to hold governments accountable, particularly for the direction of scientific progress and its impact on human rights".[653] Moreover, the relationship between human rights and science is further complicated by the fact that the principal producers of scientific advances have been dominated by private and non-State actors.[654] Thus, rather than the consideration of science to be in the service of humanity, the contemporary approach

[646] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009); The Declaration on the Use of Scientific and Technological Progress in the Interest of Peace and for the Benefit of Mankind (GA Res. 3384 (XXX)),
[647] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009).
[648] Ibid.
[649] Ibid.
[650] Ibid.
[651] See, UNDP, Human Development Report 2001: Making New Technologies Work for Human Development (New York and Oxford: Oxford University Press: 2001): 39.
[652] Ibid.
[653] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009).
[654] Ibid.

concentrates on science in the service of profit in that financial profit and economic growth have come to be regarded as the sole purpose of science and technological innovation.[655]

Therefore, in consideration of these issues, a human right approach to the right to science should be cognizant of which kinds and forms of scientific progress should be promoted. Correspondingly, this inquiry should moreover encompass the question of access to which kinds of knowledge and technologies should be facilitated.[656] Such a focus entails that rather than considering science as an end in itself, it should be seen as an instrument.[657] Hence, in view of the fact that the introduction and dissemination of certain kinds of technologies may be ill-equipped to address the needs of certain categories of users, the right to science should be approached with respect to the intended beneficiaries and correspondingly, on the impact such technologies will have on human development.[658] The discussion below will explore the progress made thus far towards providing clarity to the right to science.

[655] Shaver, "The Right to Science", 411-430.
[656] Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food: From Conflict to Complementarity", 304-350.
[657] Ibid.
[658] Ibid.

10.2. Progress Towards Clarity of the Right to Science

The endeavor towards providing clarity to the normative contents of the right to science requires an understanding of what is meant by terms, "science", "scientific progress" as well as "benefits" as enunciated in the above international human right instruments.[659] In this regard, different formulations to what the term "science" underscores have been suggested.[660] According to the Special Rapporteur in the Field of Cultural Rights, "Science" refers to knowledge that is testable and refutable[661] in all fields of inquiry including the social sciences.[662] The terms "benefits"[663] and "scientific progress" are used to convey the positive impacts of science on human well-being.[664] As such, the phrase "progress" presupposes that the development of science is meant to create positive effects for humans and society as a whole.[665] Furthermore, "progress" may also be tied to the idea of the progressive realization of ESCR as enunciated in Article 2(1) ICESCR.[666] This said, the "benefits" that are to be derived from science do not solely imply the scientific results and the outcomes therefrom, but also connote the scientific process, its methodologies, and tools.[667] It is important to highlight at this junction that scientific inquiry and technology are not inherently good or bad in and of themselves. This is due to the fact that they are instruments that will serve the values they are guided by.[668]

The effort to clarify the normative contents of the right to science additionally requires an understanding of who the actors or subjects of the right are? As an individual human right recognized by the international community of States, the holders of the right to science are

[659] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 24.
[660] For different formulations of what is implied by "science", see for instance, Recommendation on the Status of Scientific Researchers, Adopted on (November 20 1974), Paragraph: 1a. available at, www.unesco.org. See also, United Nations Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 17 (2006): Paragraph 9.
[661] As provided in the Venice Statement, science "is not only about advancing knowledge" but also encompasses the enhancement of "...the conditions for further scientific and cultural activity. See, UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): Paragraph III (8).
[662] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 24.
[663] In the context of human rights law, the benefits arising out of science should contribute to the fulfillment and protection of human rights in general. See, Fons Coomans, "A Dual Perspective on the Right to Enjoy the Benefits of Scientific Progress, In Critical Indigenous Rights Studies, (Giselle Corradi, Koen De Feyter, Ellen Desmet, et al.(eds.), (Routledge, New York and London: 2019): 89-110.
[664] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 24. For an additional definition of science, See, Shaver, "The Right to Science", 411-430.
[665] Coomans, "A Dual Perspective on the Right to Enjoy the Benefits of Scientific Progress", 89-110.
[666] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Article 2(1); Coomans, "A Dual Perspective on the Right to Enjoy the Benefits of Scientific Progress", 89-110.
[667] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 24.
[668] For instance, in the post-WWII period, the prevailing historical circumstances made made the international community aware of the immense harm that can come from the misuse of science. See, Shaver, "The Right to Science", 411-430.

individuals.[669] This means that States Parties are obligated to distribute the applications of scientific progress to everyone, regardless of whether individuals had contributed to scientific progress.[670] In addition to this, according to the Venice Statement on the right to science[671], whereas the right of the individual to enjoy the benefits of scientific progress and its applications must be respected, the right to science also constitutes the right of communities to share in these benefits.[672] Hence, this underlines that the right is to be enjoyed both individually and collectively.[673] A similar question that is to be raised relates to the issue of who is the duty bearer of the right to science? In this regard, it is evident that States are the primary bearers of this duty. This conclusion is to be derived from a thorough reading of Article 15(2) which provides the steps that are to be taken by the State Parties so as to fully realize the right to science.[674] Accordingly, as noted above, such actions to be taken comprise of those necessary for the conservation, development, and diffusion of science and culture.[675]

The above examination of the subjects of the right to science would also necessitate clarification as to what this right entitles individuals to, i.e., the object or substance of the right?[676] In this regard, it is evident that the right to science directly refers to the right to scientific research and developments emanating thereof.[677] However, this understanding is

[669] Coomans, "A Dual Perspective on the Right to Enjoy the Benefits of Scientific Progress", 89-110.
[670] Haugen, Human Rights and Technology- A Conflictual Relationship?", 224-244; Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1-36.
[671] Between 2007-2009, the UNESCO initiated three expert meetings with the view to inform the development of a general comment on the right to science. To this end, leading experts from academia, intergovernmental organizations and bodies, and non-governmental organizations participated in the meetings. In 2009, this effort culminated in the development of the Venice Statement which has provided a preliminary assessment of the meaning and content of the right. In addition to this, the Venice Statement called for the participation of "the scientific and academic communities" in elucidating the meaning of the right, raising awareness about the right, its implementation and the monitoring of its realization. This effort has led to the adoption of a statement on the right to enjoy the benefits of scientific progress and its applications by American Association for the Advancement of Science (AAAS). Building on this initial step, in 2011 the Special Rapporteur in the field of Cultural rights, Farida Shaheed, submitted to the Human Right Committee a report on the right to enjoy the benefits of scientific progress and its application. This effort has provided the impetus at clarity regarding the contents of the right and obligations on State Parties. This endeavor has been significant especially in identifying a human rights approach to the right to science. For more, see, UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009); AAAS Science and Human Rights Coalition, "Defining the Right to Enjoy the Benefits of Scientific Progress and Its Applications: American Scientists' Perspectives" (Report prepared by Margaret Weigers Vitullo and Jessica Wyndham), (October 2013). DOI: 10.1126/srhrl.aaa0028; Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).
[672] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009); Helle Pordsam and Mathias Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application - Report 2012, (A/HRC/20/26), in Negotiating Cultural Rights: Issues at Stake, Challenges and Recommendations, (Luckey Belder and Helle Pordsam, eds.,) (UK, Elgar Publishing: 2017): 79-100.
[673] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009); Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.
[674] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Article 15(2).
[675] Ibid.
[676] Coomans, "A Dual Perspective on the Right to Enjoy the Benefits of Scientific Progress", 89-110.
[677] Ibid; Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 25.

rather premature due to the fact that the right to science encompasses broader constitutive components. In an attempt to gear the development of an authoritative interpretation on the right to science, the Special Rapporteur in the Field of Cultural Rights, Farida Shaheed, has provided the normative contents for this right in a manner which gives recognition to a broadened understanding of the object of the right to science. According to her, access of everyone to results of scientific progress is inclusive of, "science as a whole"[678] but not only to the specific scientific outcomes or applications.[679] Hence, access to results of scientific progress entails access to scientific knowledge, scientific information, and scientific advances without discrimination as to, *inter alia*, race, colour, race.[680] The discussion below will be devoted to expounding the normative contents of the right to science.

[678] This exposition is also used in the Venice Statement. It provides that, " This right is applicable to all fields of science and its applications.", UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): paragraph IV (12).
[679] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 26.
[680] Ibid.

10.3. Normative Contents

The constitutive elements of the right to science, according to the Venice Statement should be inclusive of, the creation of an enabling and participatory environment for the conservation, development, and diffusion of science and technology.[681] Secondly, the right to science implies ensuring access to the benefits of scientific progress and its application on a non-discriminatory basis, including technology transfer and capacity-building.[682] Thirdly, the right to share the benefits of scientific progress implies due protection from abuse and adverse effects of science and its applications.[683] A similar exposition has been provided by the Special Rapporteur in the Field of Cultural Rights. In her report devoted to unpacking the normative contents and ensuring State obligations arising out of the right to science, the normative contents of the right to science comprise of, access to the benefits of science to everyone devoid of discrimination; opportunities for all to contribute to the scientific enterprise and freedom indispensable for scientific research; the participation of individuals and communities in decision-making; and the creation of an enabling environment fostering the conservation, development and diffusion of science and technology.[684] The discussion below will expound further on the contents of each of these elements.

In more detail, access of everyone to the benefits arising out of this right entails access to, as noted, "science as a whole", but not only to the specific scientific outcomes or applications.[685] As such, scientific knowledge, information and advances must be made accessible to all.[686] Such access to results of scientific progress is to be ensured devoid of, as provided under Article 2 of the ICESCR[687], discrimination of any kind as to race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. In view of the multiplicity of scientific advances that are available and the need to prioritize, the Special Rapporteur identifies as “one core principle”, the right of everyone, particularly that of marginalized populations, to “innovations essential for a life with dignity.[688] In this regard,

[681] More specifically, the creation of an enabling environment entails among other things, ensuring academic and scientific freedom, including freedoms of opinion and expression, to seek, receive and impart information, association and movement. Moreover, it constitutes the provision of equal access and participation of all actors (public and private) and capacity-building and education. See, UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): Paragraph 13.
[682] Ibid.
[683] This obligation to protection from the adverse effects of science is of particular importance especially in the area of scientific and technological research involving toxic chemical substances or nuclear material, in the development of weapons and in the area of genetic research and engineering. This is because such scientific endeavors are likely to jeopardize human rights; *inter alia*, the right to health, food, housing, privacy, and even the right to life., See, UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): Paragraph 13(C); Claude, "Scientists’ Rights and the Human Right to the Benefits of Science", in Chapman and Russell (eds), Core Obligations: Building a Framework for Economic, Social and Cultural Rights, (Antwerp, Intersentia: 2002).
[684] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 25.
[685] Ibid, Paragraph 26.
[686] Ibid.
[687] The United Nations General Assembly, “International Covenant on Economic, Social, and Cultural Rights”, (1966): Article 2.
[688] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 26-29.

on a non-discrimination basis, States must ensure that the benefits of science are not only physically available but also economically affordable.[689] Hence, a human rights approach to science (to consider science as a human right),[690] implies the due focus to be given to the disadvantaged which implies according to Audrey Chapman, a kind of affirmative action in science and technologies so as to benefit those that are at the bottom of the economic and social scale.[691] Thus, as will be explored below, the realization of the right to science would impose a positive duty on the State to provide equal treatment as well as opportunities for all, in consideration of ability and competence.[692] As such, State Parties in their implementation of the right to science will have the immediate obligation to eliminate all forms of discrimination both in law (de jure) and in fact (de facto).[693] To this end, in order to bring about equality to the most disadvantaged, such as women, for instance,[694] the taking of special and affirmative measures by the State may be required.[695] This may require the State concerned to fulfill the right to science which imposes on the State concerned a duty to put in place the infrastructure; legislative, administrative, financial and institutional measures with a view to creating a conducive environment for scientific research to take place.[696] In this regard, for example, the State concerned should undertaking special measures to encourage women to take part in scientific research.[697] This is to be carried out, according to the CESCR by overcoming institutional barriers and related barriers that prevent women from fully engaging in science education and scientific research.[698] Furthermore, it may also signify that States should direct resources on an equal basis as those of men, to scientific research in relation to the health and economic needs of women.[699]

Moreover, as noted, access of everyone to results of scientific progress encompasses access to, "science as a whole", but not only to the specific scientific outcomes or applications.[700] Hence, access to scientific progress entails access to scientific knowledge, information, and advances. Thus, the right to have access to scientific knowledge is pivotal for the realization

[689] Ibid, Paragraph 30; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.
[690] According to Lea Shaver, "To call science a human right is precisely to insist that the supply of scientific knowledge and the development of technology must not be left entirely – or even primarily – to market forces". Shaver, "The Right to Science", 411-430.
[691] Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1-36.
[692] Yvonne Donders, "The Right to Enjoy the Benefits of Scientific Progress: In Search of State Obligations in Relation to Health", Medicine, Health Care and Philosophy 14, No 4, (2011).
[693] Ibid.
[694] The right to enjoy the benefits of scientific progress may imply the taking of special measures for certain vulnerable or disadvantaged groups, inter alia, women, minorities, indigenous people, people living in poverty. See, Donders, "The Right to Enjoy the Benefits of Scientific Progress".
[695] The taking of differential treatment does not automatically constitute discrimination,
[696] Donders, "The Right to Enjoy the Benefits of Scientific Progress".
[697] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Article 3; United Nations Committee on Economic, Social and Cultural Rights (CESCR), General Comment No 16: The Equal Right of Men and Women to the Enjoyment of all Economic, Social and Cultural Rights (Article 3 of the Covenant), August 11, 2005, E/C.12/2005/4: Paragraph 31.
[698] United Nations Committee on Economic, Social and Cultural Rights (CESCR), General Comment No 16 (2005): Paragraph 31.
[699] Donders, "The Right to Enjoy the Benefits of Scientific Progress".
[700] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 26.

of the right to science.[701] Access to scientific knowledge implies, firstly, access to scientific results, scientific information, scientific applications, and technologies that should be available for researchers but also to the public through digital media.[702] Secondly, it entails the right to have access to scientific applications and technologies without discrimination in that everyone, especially marginalized populations, should be entitled to innovations which are necessary for a life with dignity.[703] The Special Rapporteur in the Field of Cultural Rights has devoted considerable space on this aspect of access as such signaling that it is pertinent for the realization of the right to science.[704] In this regard, on a non-discrimination basis, States must ensure that the benefits of science are not only physically available but also economically affordable.[705] The obligation to ensure the affordability of scientific innovations may, for instance, entail decoupling research and development costs from the final product prices.[706] This means that the scientific process and the results (products) must be conceived as public goods intended for the benefit of all, not merely the already privileged who purchase access in a marketplace.[707] The third component for ensuring access to science connotes access to the internet and information communication technologies.[708] In this respect, the CESCR has stressed that Governments have the duty to respect (a negative duty not to interfere) and protect (positive duty to take needed action) the freedom of information and expression, including on the Internet to ensure the implementation of Article 15 of the Covenant.[709] In this vein, considering firstly that there is a great digital divide and the provision of information communication technologies are costly, resource constraints may put a hurdle on States so as to ensure the taking of needed action.[710] Secondly, Intellectual Property Rights (IPRs) concerns continue to put a hurdle on such digital access to the

[701] Ibid, Paragraph 27; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.

[702] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 28; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.

[703] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): 29. Marginalized populations such as people living in poverty and persons with disabilities, as well as the elderly women and children, should have access to scientific innovations, processes and products.

[704] See, Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.

[705] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 30; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.

[706] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): 34; Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property, (Geneva, World Health Organization: 2011): WHA 61.21 and 63.28.

[707] Shaver, "The Right to Science", 411-430.

[708] Human Rights Council, Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, A/HRC/17/27, (May 16 2011); Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.

[709] Committee on Economic, Social and Cultural Rights, Consideration of Reports Submitted by States Parties Under Articles 16 And 17 of the Covenant, E/C.12/1/Add.107, (May 13, 2005). Committee on Economic, Social and Cultural Rights, Consideration of Reports Submitted by States Parties Under Articles 16 And 17 of the Covenant, E/C.12/LYB/CO/2, (January 25 2006): Paragraph 39; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.

[710] Human Rights Council, Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, A/HRC/17/27, (May 16 2011).

public.[711] This said, however, with due consideration to the crucial importance of science and technology for, *inter alia*, human development, States should invest, to the maximum of their available resources, in scientific and technological advancement and to share the benefit arising thereof.[712]

The second constitutive element of the right to science is related to opportunities for all to contribute to the scientific enterprise and freedom indispensable for scientific research. In this regard, the freedom which is necessary for scientific inquiry[713] implies that the scientific enterprise should remain independent by being free of political interference for instance.[714] This imposes a negative duty on States to refrain from unjustifiably[715] interfering in science and the scientific inquiry in such a manner that will jeopardize scientific independence. [716]

This said, however, the right to science also imposes on the States concerned the duty to protect. This entails a positive duty on the State to prevent third parties from violating the right to science, for instance, by blocking scientists that are claiming ownership of research and from unauthorized use of science, which is linked to intellectual property schemes.[717] Moreover, this duty implies that the State should also protect the public from possible scientific harm emanating from State organs and third parties.[718] This will ensure that scientific professionals are to proceed in such a manner that guarantees ethical safeguards.[719] In addition to assuring the independence from political influence or otherwise, it entails the right to be able "....to freely communicate research results to others, and to publish and publicize them without censorship and regardless of frontiers".[720] Furthermore, the freedom as needed for scientific research comprises of the right of everyone to participate in the scientific enterprise devoid of discrimination. [721]

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[711] Ibid.
[712] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Article 2(1); United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990): Paragraph 10 and 11.
[713] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009),
[714] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 39; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.
[715] The State concerned should only intervene in the circumstance where science is deemed to have an adverse effect on people, societies or the environment. See, Donders, "The Right to Enjoy the Benefits of Scientific Progress.
[716] Ibid.
[717] Ibid.
[718] Ibid.
[719] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 39; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.
[720] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 40; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.
[721] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 42; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application", 79-100.

According to the Special Rapporteur, the third integral component for ensuring the benefit of everyone to benefits of science deals with the participation of individuals/communities in decision-making.[722] Such a participatory environment is crucial because it helps to ensure the protection of the public from the adverse effects of scientific testing or applications thereon, *inter alia*, on their food security.[723] Moreover, it helps to ensure that scientific inquiry is conducted on key issues that touch upon for example, the most vulnerable.[724] Thus, scientific research should be the target of public funding and that innovation policy should be geared towards prioritizing socially valuable ends as well as the widespread diffusion of technological benefits to vulnerable populations.[725] This is because scientific inquiry cannot completely be free in that it must be conducted in a socially and ethically responsible manner especially when human research groups are the poor and vulnerable.[726] The emphasis on ethical responsibility extends not only to ascertaining universal access to the benefits of scientific advancement but also that public participation should inform the values that guide the very scientific process. [727]

The last component of the right to science deals with the creation of an enabling environment for the conservation, development, and diffusion of science.[728] This is related to Article 15 (2) of the ICESCR that requires the State Parties to take those actions as will be necessary for the conservation, the development, and the diffusion of science.[729] Thus, according to the Special Rapporteur, conservation requires the State Parties to identify and safeguard scientific knowledge, products, and tools, including literature, databases, specimens, and equipments as will be necessary for the conservation, the development and the diffusion of science and culture.[730] Moreover, development requires a positive obligation on the States to the progress of science and technology for the human benefit through, for instance, national plans of action.[731] In the light of this, scientific advancements by Scientists should be cognizant of the responsibility to ensure that the inquiries are responsive to "...social needs, informed by outside perspectives and knowledge, and translated to reach beyond “the ivory tower".[732]

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[722] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 43; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application”, 79-100.
[723] Ibid.
[724] Ibid.
[725] Shaver, "The Right to Science,” 411-430.
[726] See also, Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 52; Pordsam and Mann, "The Right to Enjoy the Benefits of Scientific Progress and Its Application”, 79-100.
[727] Shaver, "The Right to Science”, 411-430.
[728] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 45.
[729] The United Nations General Assembly, “International Covenant on Economic, Social, and Cultural Rights” (1966): Article 15 (2).
[730] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 46.
[731] Ibid, Paragraph 47.
[732] Refers to a state of separation from issues of the real world. Shaver, The Right to Science: Ensuring that Everyone Benefits from Scientific and Technological Progress", 411-430.

Lastly, the dissemination of scientific knowledge and diffusion relates to the application of scientific knowledge within the scientific community and in society at large.[733]

10.4. State Obligations to Ensure the Right to Science

What kind of obligations may State Parties be bound by in relation to the right to science? Even though the obligations incumbent on State so as to ensure the right to science have not yet been clarified, based on a thorough examination of scholarly contributions, the State duties; to respect, protect and fulfill can be extended to the right to science in order to forge clarity to the ensuing State obligations. The discussion below will explore this matter.

The obligation to respect the right to science imposes a negative duty on States not to intervene with the realization of the right to science.[734] This can be interpreted to mean that States should respect scientific freedom and choices of research subjects and the methods of research.[735] Thus, this obligation requires the State to respect the freedoms indispensable for scientific research and creative activity by ensuring the freedom of thought, to hold opinions without interference, and to seek, receive, and impart information and ideas of all kinds.[736] This implies moreover that the State should respect the right of scientists to form and join professional societies and associations, as well as academic autonomy. This duty entails that the State is not to unjustifiably interfere in science. This said, to the extent that science is to be detrimental to the society at large, the State will be duty bound to take action.[737] This duty furthermore entails that States should acknowledge scientists by not getting in the way of their material interests.[738] This duty moreover requires the State to respect access and participation of the public in science by granting access to important sources such as libraries and the Internet.[739] Hence, States are to refrain from creating barriers to access to knowledge or participation of the public by, for instance, preventing citizens from the use of libraries or the Internet, or interfere with the free movement of information and collaboration of scholars across borders.[740]

The obligation to protect when employed in the context of the right to science puts a positive duty on the State to provide protection from violations of the right to enjoy the benefits of

[733] Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012): Paragraph 48.
[734] Donders, "The Right to Enjoy the Benefits of Scientific Progress", 371-381; Haugen, "Human Rights and Technology— A Conflictual Relationship?", 224-244.
[735] Donders, "The Right to Enjoy the Benefits of Scientific Progress", 371-381.
[736] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): Paragraph 14-16; Muller, "Remarks on the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (Article 15(1)(b) ICESCR)", 765-784.
[737] Donders, "The Right to Enjoy the Benefits of Scientific Progress", 371-381; Haugen, "Human Rights and Technology— A Conflictual Relationship?", 224-244.
[738] Ibid.
[739] Ibid.
[740] Donders, "The Right to Enjoy the Benefits of Scientific Progress", 371-381.

scientific progress by non-State actors.[741] Accordingly, it implies that the State should prevent and preclude the utilization by third parties of science and technologies in such a way that they are detrimental to the human rights, fundamental freedoms, and the dignity of the public.[742] In relation to intellectual property schemes, for instance, it entails blocking scientists claiming ownership of research and from unauthorized use of science.[743] Moreover, this duty also requires the State from making use of this provision to limit or violate other human rights.[744] But the State should also protect people from potential scientific harm, by State organs, and by third parties, for instance, pharmaceutical companies.[745]

The obligation to fulfill (provide) in relation to the right to science entails a positive duty in that it requires the State to put in place, legislative, administrative, financial measures, including the infrastructure needed, in order to promote the development and diffusion of science.[746] Moreover, this duty requires the State to ensure access to scientific and technological knowledge on a non-discriminatory basis in order to address the needs of the marginalized and disadvantaged.[747] To this end, the State should ensure access to the Internet, provide information on scientific progress and encourage the widest participation from the public in decision-making about science and technology. The obligation to fulfill (facilitate) moreover entails that by identifying factors that may derail the enjoyment of this right, the State concerned must seek to remove these obstacles that prevent the full enjoyment of this right. [748]

The full realization of the right to science may also entail a duty to foster international cooperation and assistance in science and technology. In view of the resource implications of the above-discussed State duties, this obligation is instrumental for the realization for the right to science.[749] This obligation is to be found in several provisions of the ICESCR including Article 15(4) in relation to the right to science.[750] The provision calls for the States Parties to recognize "...the benefits to be derived from the encouragement and development of international contacts and co-operation in the scientific and cultural fields".[751] Therefore, a cumulative reading of this provision in the light of the right to science reveals that State

[741] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): Paragraph 14-16; Muller, "Remarks on the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (Article 15(1)(b) ICESCR)", 765-784; Donders, "The Right to Enjoy the Benefits of Scientific Progress", 371-381.
[742] Donders, "The Right to Enjoy the Benefits of Scientific Progress", 371-381; Haugen, "Human Rights and Technology— A Conflictual Relationship?", 224-244.
[743] Ibid.
[744] Donders, "The Right to Enjoy the Benefits of Scientific Progress", 371-381.
[745] Ibid.
[746] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): Paragraph 14-16; Donders, "The Right to Enjoy the Benefits of Scientific Progress", 371-381; Muller, "Remarks on the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (Article 15(1)(b) ICESCR)", 765-784.
[747] Ibid.
[748] See, Haugen, "Human Rights and Technology— A Conflictual Relationship?", 224-244.
[749] Muller, "Remarks on the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (Article 15(1) (b) ICESCR)", 765-784.
[750] See, The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Articles 2(1), 11(1) and (2), 15(4), and 23.
[751] Ibid, Article 15 (4).

Parties in addition to reliance on own resources as available within their boundaries can also rely on those resources which can be attained through international assistance and cooperation.[84] Such cooperation can be acquired for instance through technology transfer including the provision of support so as to develop the capacity of low-income countries to engage in scientific research. The Venice Statement provides in this regard that States are to actively promote capacity building on a global scale, particularly in those countries which are relatively inactive in this regard.[752]

Therefore, as the above discussion has denoted, even though the right to science has not received clarification as regards its constitutive elements and obligations incumbent on the State Parties towards its full realization, the importance of its consideration as a human right in and of itself has become a growing necessity. As noted, this task has been overtaken by the CESCR which is currently under discussion towards the development of a General Comment on this right. A thorough understanding of this very due consideration is pertinent when it comes to the realization of other human rights in general and more specifically the right to adequate food. This is because the relationship between science and human rights, as inclusive of the right to food, has thus far been constructed in such a manner that the latter is the sole beneficiary of scientific endavours. However, as will be discussed in subsequent sections, this one-sided assumption has not always taken place as scientific progress has at times come to the detrimnent of the right to food. Nonetheless two-sides of the story need to be looked into if scientific advancements are to genuinely tailor to the realization of human rights.

[752] UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): Paragraph 9, 12 (g) and 16 (d); Muller, "Remarks on the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (Article 15(1)(b) ICESCR)", 765-784.

Chapter Three

Trumped by Liberalization: Trade and the Right to Food

3.1. Introduction

Trade in agriculture had occupied an unclear place in the 1947 General Agreement on Tariffs and Trade (GATT).[753] This was due to the fact that the agricultural sector in the post-WWII period was made the subject of heavy state intervention due to the consideration that the sector was, politically and economically speaking, conceived to be a sensitive area that needed protection from competition.[754] Hence, the GATT had loopholes by which its trade rules as regards agriculture were lax when compared to the rules that applied to industrial goods. Consequently, the lack of strict rules on agriculture gave the Member States (henceforth, MS), mainly the U.S., EU, and Japan, the license to impose heavy tariffs and subsidies as a consequence leading to market disruptions.[755] In this regard, it will have taken five decades until the start of the Uruguay Round negotiations (1986-1994) which would culminate in the introduction of, somewhat, clear[756] rules in agriculture. This said, however, the resulting agreement that came out of the Round, in this regard, the AOA[757], has not resulted in the removal of State protectionist policies in agriculture. This has been because the three-tiered obligations, tarrificaion with the intention to increase in market access, reduction in export subsidies and domestic support measures the Agreement has put on MS of the WTO; have easily been violated, by developed country MS that claim to have a comparative advantage in the sector. Hence, by making use of the loopholes found therein, these MS have evaded their obligations.[758]

The implication of all these developments has directly affected the realization of the right to adequate food[759] of developing countries MS. This has been because through the utilization of the weaknesses found in the AOA, developed countries MS have continued to heavily subsidize their agricultural sector while minimally opening their respective economies to the imports coming from developing country MS. Consequently, these developing countries have been restrained to ensure the realization of the right to adequate food to their populations as

[753] General Agreement on Tariffs and Trade 1994, April 15, 1994; Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 187, 33 I.L.M. 1153 (1994).
[754] For more, see, Robert Hudec, Does the Agreement on Agriculture Work? Agricultural Disputes after the Uruguay Round, Working Paper, No 98-2, (International Agricultural Trade Research Consortium, 1998)
[755] These disruptions have resulted from the utilization of protectionist policies, such as export subsidies, by MS which made markets unpredictable, R. Sharma, "Agriculture in the GATT: A Historical Account" in Yon Fernández de Larrinoa Arcal and Materne Maetz, Multilateral Trade Negotiations in Agriculture: A Resource Manual, Food and Agricultural Organization of the United Nations (Rome, Italy 2000).
[756] This is because the GATT had loopholes by which its trade rules as regards agriculture were lax when compared to the rules that applied to industrial goods.
[757] Agreement on Agriculture, April 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 410.
[758] FAO, The State of Food and Agriculture, Agricultural Trade and Poverty: Can Trade Work For the Poor?, 40-41; Background Note by the UNCTAD Secretariat, impact of the Reform Process in Agriculture on LDC's and Net Food-Importing Developing Countries and Ways to Address their Concerns in Multilateral Trade Negotiations, 6-7.
[759] U.N. Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999).

they generate insufficient amount of revenue from exports to enable them to afford their import bills. Moreover, as a result of heavy state subsidization in developed countries, these countries have also seen import surges in their domestic market resulting from the arrival of cheap subsidized agricultural commodities. This has especially affected agricultural producers in those countries that could not compete with artificially cheap commodities hence forcing many to seek employment in other sectors. As such, even though the Uruguay Round was successful in as far as it adopted rules solely focused on agriculture, it has failed in bringing about discipline in the way its rules are being applied to agriculture with serious implications on the right to food.

With these issues in mind, this chapter looks in-depth into the underlying factors that have led to such protectionist policies by developed country MS and assesses to what extent protectionism has impeded the realization of the right to food? Moreover, the research adds a novel contribution by asserting that the manner in which the transfer of technology is being carried out in international trade transactions - specifically related to technical and scientific innovations in the agricultural sector - has not given due recognition to the right to science (Article 15(1)(b)) of the ICESCR). Hence, it contendes that the rules which guide international trade in agriculture have led to two kinds of impediments; the right to adequate food on the one hand and the right to science through the means of technology transfer, on the other hand.

As such, the first section provides an overview of the liberal assumptions about the benefits of trade in general, how such assumptions are expected to enhance food security and the limits inherent in the liberal school to provide a satisfactory explanation about international trade in food commodities. The second section discusses the GATT trade agenda followed by an assessment of the undisciplined manner[760] under which agricultural trade was submerged. The following section discusses how agriculture was dealt with in the lead up to the Uruguay Round of Trade Negotiations. This is followed by an overview one of the agreements that came out of the Uruguay Round, the AOA, including its three-tiered obligations, tarrfication with the intention to increase market access, reductions in export subsidies, and domestic support measures, it has put on MS of the WTO with a view to starting the engine towards liberalization. The following section analyzes some of the provisional imbalances that have been observed in the AOA since it has entered into force, leading to unequal playing fields between the MS. The subsequent section is devoted to an analysis of how international trade has restrained the realization of the right to food. This section is divided into five sub-parts; the first sub-section discloses the limits which have been results of the dependency of developing countries on food imports emanating from both the policies under the Structural Adjustment Programs (SAPs) in the 1980s and those that have resulted from the AOA. The second sub-section scrutinizes the restriction that emanate from deteriorating terms of trade mainly for developing countries. The third sub-section analyzes how agricultural trade obligations have restrained the policy space for developing countries to adopt those policies

[760] The reason for this has been that when the GATT rules that applied to industrial goods are to be compared to those applicable in agriculture, the rules that were applicable to the later were lax.

that will enhance food security. The final part of the chapter investigates how the manner in which the afore-discussed rules have been operating has restrained the right of everyone to benefit from results of scientific progress.

3.1.1. The Dominant Assumption about the Benefits of Trade

Economic Liberalism is based on the principle that societies should use their resources with the aim of maximizing wealth.[761] In this regard, Liberalism considers the market to be the instrument through which wealth will be maximized. Hence, trade is to be determined by supply and demand rules in the market place.[762] This, in turn, is to be achieved through price mechanism, i.e., based on supply and demand, which is expected to lead to net gains. Even though Liberal Schools differ on the role of the State in the economy, for the most part, there is a consensus in the Liberal School on minimal state intervention in the market, i.e., laissez-faire.[763]

In this regard, in 1776 Wealth of Nations was published by Adam Smith in which he popularized his theory of absolute advantage.[764] The theory contends that countries should specialize in the production of those goods over which they have an absolute advantage. Therefore, the theory posits that economic growth and wealth accumulation are incumbent upon the division of labor through specialization in goods over which countries have an absolute advantage.[765]

This said the basis of today's Liberal theory is David Ricardo's theory of comparative advantage. David Ricardo developed this theory in his book Principles of Political Economy and Taxation in 1817.[766] The theory posits that even though countries may not have an absolute advantage in the production of one good, they would still benefit from trade if they specialize in the production of those goods over which they have a comparative advantage.[767]As a result, according to him, trade will be beneficial to countries given they specialize in the production of goods over which they have a comparative advantage, i.e., goods that have a low cost of production.[768] Accordingly, a country is said to have a comparative advantage given the opportunity cost of producing a particular good in terms of other goods is lower in that country than it is if production took place in other countries.[769] As such, the theory asserts that if countries engage in the production of those goods which have a low opportunity cost of production and engage in trade with other countries that have done the same, trade will lead to global efficiency gains and therefore an increase in the production of goods.[770]

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[761] For more, see, Robert Gilpin, The Political Economy of International Relations, (Princeton University Press, Brighton: 1987) and Smith, Adam, 1723-1790. The Wealth of Nations, (New York: Modern Library, 2000).
[762] Paul R. Krugman & Maurice Obstfeld, International Economics Theory and Policy(Frete Universal Berlin Wirtschaftswissenschaft: 2003):12ff.
[763] Gilbert, The Political Economy of International Relations, 27-45.
[764] Ibid; Adam Smith, 1723-1790. The Wealth of Nations, (New York: Modern Library, 2000).
[765] Smith, The Wealth of Nations, (New York: Modern Library, 2000): 1723-1790.
[766] For more, see, David Ricardo, "On the Principles of Political Economy and Taxation", In Piero Sraffa ed. The Works and Correspondence of David Ricardo: Vol. I, (Indianapolis: Liberty Fund).
[767] Gilpin, The Political Economy of International Relations, 175-178.
[768] Krugman & Obstfeld, International Economics Theory and Policy, 12ff.
[769] Ibid.
[770] Ibid.

Therefore, the theory of comparative advantage is based on the premise that even though countries may not have an absolute advantage in the production of one good, they will stand to benefit from trade given they export the goods, which they can produce much easier. In this regard, a country is said to have a comparative advantage in the production of a good given such production will result in low opportunity costs. This is due to the fact that countries are confronted with different opportunity costs in the production of goods such as different endowments like land, labor, capital, technology, and climate. This said, however, the theory asserts that each country is endowed with a comparative advantage in the production of some goods.[771] Even though Ricardo has not provided the reasoning behind why countries have different costs of production, the theory was later expanded to also give consideration to this question. Accordingly, the Swedish economists, Heckscher and Ohlin developed the Heckscher–Ohlin theorem in the 1930s.[772] According to this theorem, which has provided an accurate explanation into how international trade operates, the measure of comparative advantage of a country is to be based on factor endowments, *inter alia*, land, labor, and capital. Accordingly, comparative advantage is to be determined by national differences in these factor endowments. While this sums up the brief discussion about the assumptions that underlie the dominant liberal economic theory, the remaining sections will examine both the pros and cons of the main tenants of the liberal School in relation to food security

[771] See, Ricardo, "On the Principles of Political Economy and Taxation"; World Bank, “Global Monitoring Report: Food, Nutrition and the Millennium Development Goals”, (World Bank, Washington, D.C: 2012).

[772] For more, see, E. Heckscher, The Effect of Foreign Trade on the Distribution of Income, In Howard S. Ellis and Lloyd A. Metzler eds.)," Readings in the Theory of International Trade", (Philadelphia: Blakison 1949, 1919).

3.1.2. How is Trade Expected to Enhance Food Security?

The section below will assess how these liberal principles are expected to enhance food security as such laying the foundation to the subsequent analysis.

For advocates of free trade[773], among different sectors, agriculture is one area that is considered to benefit greatly from a free market-oriented international trade, which is guided by the principles of comparative advantage. This said, how does trade lead to efficiency gains in the agricultural sector? In the light of this, economists have provided three arguments for why this is the case, namely: 1. the advantages of comparative advantage, 2. the transmission function of trade which connects economies and 3. the costs that emanate from protectionist economic policies. The discussion below will explore these issues.

Supporters of free trade consider agriculture to be among the sectors which is to benefit from free trade and a means to ensure food security.[774] They contend that the conduct of free trade based on comparative advantage will boost competition in the market which will, in turn, lead to specialization as well as efficiency in food production. The underlying reason for this rise in efficient production is due to the fact that more countries will be engaged in food production in which they have low opportunity costs.[775] This implies for instance that crops will be produced in those countries that can produce at a much lower cost than others. Therefore, trade advocates assert, crops should be produced in those countries that have the natural endowments necessary to engage in production through the employment of a few resources.[776] Accordingly, this is expected to result in increased availability as well as the accessibility of food both nationally as well as globally. Consequently, due to a rise in total food supply, food will be more available to all countries including those that can now import the agricultural commodities they need instead of producing them on their own.[777] As such, when forces of demand and supply are taken into consideration, a rise in supply is expected to lead to a fall in prices. As a result of the expected fall in the price of food, trade is thought to boost food security globally including in poor countries. For this reason, for proponents of

[773] Pascal Lamy, "The Geneva Consensus: Making Trade Work for Us All", (Cambridge University Press, Cambridge: 2013); FAO, "Trade Reforms and Food Security", (FAO, Rome: 2003a); World Bank, "World Development Report 2008: Agriculture for Development", (World Bank, Washington, D.C: 2008); World Bank, "Global Monitoring Report: Food, Nutrition and the Millennium Development Goals", (World Bank, Washington, D.C: 2012).
[774] Ibid.
[775] R. Schumacher, "Deconstructing the theory of comparative advantage", World Economic Review, 2, (2013): 83–105; R. Prasch, "Reassessing the theory of comparative advantage", Review of Political Economy, 8(1), (1996): 37–56; Jennifer Clapp, "Food Security and International Trade: Unpacking Disputed Narratives", Background paper prepared for The State of Agricultural Commodity Markets 2015–16 (FAO, Rome, Italy 2015).
[776] See for example, Clapp, Trade Liberalization and Food Security: Examining the Linkages, 8-9.
[777] Lamy, "The Geneva Consensus: Making Trade Work for Us All", (Cambridge University Press, Cambridge: 2013); FAO, "Trade Reforms and Food Security", (FAO, Rome: 2003a), World Bank, "World Development Report 2008: Agriculture for Development", (World Bank, Washington, D.C: 2008); World Bank, "Global Monitoring Report: Food, Nutrition and the Millennium Development Goals", (World Bank, Washington, D.C: 2012).

free trade, efficiency in production will lead to efficiency gains; greater accessibility of food, higher employment rates and hence improved food security.[778]

Therefore, for proponents, international trade serves a major role in opening up and integrating economies into large markets. Moreover, trade has been beneficial in so far as it can lead to technology transfer and enhanced investment.[779] In this light, to the extent that international trade spurs broad-based economic growth and expanded participation in world markets, it is said to contribute to improvements in household food security.[780] Because of this, in line with the theory of comparative advantage, trade is expected to bring about food security if food production is done in those countries that have a special advantage.[781]

Secondly, for advocates of free trade in agriculture, trade serves as a bridge which connects countries that have limited capacity (as a result of lack of natural endowments such as land, labor, climate conditions) to produce food with those that produce food surpluses.[782] Trade is excepted to lead to the transfer of food from countries that produce a surplus to those that have deficits hence ensuring food security. Such movement of food is also promoted with due consideration to the variability of weather conditions. This means that due to changes in weather, agricultural output, especially at the national as well as regional level, is highly impacted.[783] Advocates[784] contend that when those countries that are less enriched with natural endowments face drops in production levels due to weather variability, for instance, such countries can rely on food provision through imports.[785]As such, trade serves an important function as a "transmission belt" by serving as a vehicle for food distribution. In this regard, proponents contend[786] that global agricultural output is much more stable than production that takes place at the national level (which can be restrained due to various conditions such as erratic weather conditions) because trade is expected to fill the gap by serving as a "transmission belt" to move food from surplus to deficit countries.[787] As such,

[778] Schumacher, "Deconstructing the theory of comparative advantage", 83–105; Prasch, "Reassessing the theory of comparative advantage", 37–56.
[779] The State of Food Insecurity in the World: Trade and food security: The Importance of Agriculture and Agricultural Trade in Developing Countries, (FAO, Rome: Italy 2003).
[780] Ibid.
[781] Olivier De Schutter, "International Trade in Agriculture and the Right to Food" in Accounting for Hunger: The Right to Food in the Era of Globalization, (Olivier De Schutter and Kaitlin Y Cordes, eds) (Hart Publishing, UK: 2011): 138-139.
[782] World Bank, Global Monitoring Report, Food prices, nutrition, and the Millennium Development Goals. (Washington, DC, 2012); OECD, "The Role of Food and Agricultural Trade in Ensuring Domestic Food Availability in OECD, Global food security: Challenges for the Food and Agricultural System", (OECD Publishing, Paris: 2013).
[783] Ibid.
[784] Ibid.
[785] See for example, Clapp, "Trade Liberalization and Food Security: Examining the Linkages", 8-9; World Bank, "Global Monitoring Report: Food, Nutrition and the Millennium Development Goals", (Washington, D.C.: World Bank. 2012).
[786] Ibid.
[787] Ibid.

free trade is expected to lead to the movement of food from low to high producing countries through the stabilization of prices.[788]

In this vein, according to advocates, due to the variable nature of weather conditions, international trade should be promoted not only on the above discussed[789] moral grounds but also on environmental sustainability justifications. In the light of this, trade is expected to promote sustainability with due recognition to the fact that countries cannot maintain self - sufficiency due to weather-related concerns.[790] This implies that as some countries are more vulnerable to changes in weather and climate, trade is considered to be beneficial as it promotes more sustainable ways of production.[791] This is mainly because trade is expected to promote the production of food in countries where it is most efficient to so. As such, with the sustainability consideration in mind, scare resources such as water and energy, for instance, need to be utilized efficiently with a view to ensuring the sustainability of food security.[792]

On a third ground, supporters of free trade in general and free agricultural trade, make the argument that open trade is vital as the costs associated with protectionist economic policies are much more costly when compared to the gains that ensue from trade.[793] This is because protectionist agricultural policies are distorted policies in so far as they give incorrect market signals as a result leading to lower levels of production and higher prices. Moreover, as it will be discussed in more detail later on, protectionist agricultural policies will especially be cumbersome to agricultural producers because such policies are bound to limit the market access of developing countries hence putting them in the receiving end of the global agricultural trading framework.[794] In relation to this, another point which has been an argument for trade advocates[795] has to do with the expansion of thin markets in which agricultural production in certain crops is dominated by handful of suppliers. In the scenario that these countries face production disruptions in the crops they produce, the effect will be, especially on those countries that have come to rely on the import of such crops, more pronounced leading to market volatility and vulnerability.[796] When the problem of thin

[788] World Bank, "Global Monitoring Report: Food, Nutrition and the Millennium Development Goals", (World Bank, Washington, D.C: 2012); Pascal Lamy, "Pascal Lamy Speaks on the Challenge of Feeding 9 Billion People", Speech, February 2012. Geneva. Available at: http://www.wto.org/english/news_e/sppl_e/sppl216_e.htm, Accessed on, 12.06.2018.
[789] See, section 7(1)(2). of this chapter.
[790] Lamy Pascal, "The Geneva Consensus: Making Trade Work for Us All", (Cambridge University Press, Cambridge, UK); OECD, "The Role of Food and Agricultural Trade in Ensuring Domestic Food Availability in OECD, Global food security: Challenges for the Food and Agricultural System" .
[791] For more, see, J.R., Porter et al., "Food security and food production systems", In Climate Change: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects (2014); Lamy, "Pascal Lamy Speaks on the Challenge of Feeding 9 Billion People".
[792] See, World Bank, "Global Monitoring Report: Food, Nutrition and the Millennium Development Goals".
[793] Ibid, Kym Anderson and Martin Will, "Agricultural Trade Reform and the Doha Development Agenda", The World Economy 28(9), (2005): 1301-1327.
[794] World Bank, "World Development Report 2008: Agriculture for Development"; World Bank, "Global Monitoring Report: Food, Nutrition and the Millennium Development Goals"; Anderson and Will, "Agricultural Trade Reform and the Doha Development Agenda" 1301-1327.
[795] World Bank, "World Development Report 2008: Agriculture for Development"; Lamy, "The Geneva Consensus: Making Trade Work for Us All".
[796] Ibid.

markets[797] is coupled with restrictive agricultural policies nationally such as restrictions on exports, for example, the result has seen global price hikes as happened during the 2007-2008 price crisis.[798]

As the above discussion has tried to highlight, free trade is thought to enhance food security through its role as, a "transmission belt" to move food from surplus to deficit countries, a driver of environmentally sustainable ways of production and stimulator of welfare based on specialization under which countries will produce those goods - agricultural commodities- which they can make at a low opportunity cost.

[797] Derek Headey and Fan Shenggen, "Anatomy of a Crisis: The Causes and Consequences of Surging Food Prices", Agricultural Economics 39, (2008): 375 – 91.
[798] Ibid.

3.1.3. Do These Liberal Assumptions Hold True?

While the discussion above has provided a brief explanation about why trade can be considered as a means through which food security is to be guaranteed, the discussion below will unveil reasons why the very tenants upon which the Liberal School is based on, might be ill-fitted to be employed in relation to food security. This is because of the shortcomings of the Liberal School in general in that its central arguments are based on certain assumptions holding true.[799] As such, it can be contested that given the assumptions on which the Liberal School is based on do not hold, it can then be the case that its assumptions in relation to food security may also be disputed.[800] The section below will assess why this may be the case.

International trade theory based on comparative advantage capitalizes on the immobility of capital and labor.[801] The reasoning behind this is that if factors of production were flexible, the result will see capital being geared towards destinations that have a comparative advantage while labor is likely to gravitate towards opportunities where wages are highest.[802] Rather, the theory assumes that it is only "goods" that are flexible across borders and that it is through price and exchange rate mechanisms that economies would adjust resulting in even gains for all participants (even those countries that do not have an absolute advantage).[803] Nevertheless, critics have disputed this dominant tenant of the Liberal School contending that in today's globalized world, these factors of production are indeed mobile. This has to do with the movement of capital - and to a lesser extent labor - for investment across borders driven mainly by Multinational Corporations (hereafter, MNCs).[804] This assumption of the liberal theory, however, does not take place when one considers the agricultural sector, due to the fact that as will be seen subsequenty, agribusiness MNCs have come to dominate the global value-chain in food.[805] The reason has to do with the movement of the companies to locations in developing countries in pursuit of greater benefit where there is an absolute advantage such as cheap labor and favorable climate conditions. Consequently, the benefits that accrue from such economic interactions directly go to agribusiness MNCs (owners of capital) rather than local farmers found in the host countries.[806]

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[799] Schumacher, "Deconstructing the theory of comparative advantage", 83–105; Prasch, "Reassessing the theory of comparative advantage".
[800] Clapp, "Trade and Food Security: Unpacking Disputed Narratives",12-16; Clapp, "Trade Liberalization and Food Security: Examining the Linkages", 11.
[801] Schumacher, "Deconstructing the theory of comparative advantage", 83–105; Prasch, "Reassessing the theory of comparative advantage".
[802] Schumacher, "Deconstructing the theory of comparative advantage", 83–105.
[803] Ibid.
[804] Ibid.
[805] Clapp, Food, (Polity Publishing, UK. 2013): 90-124, Olivier de Schutter, Agricultural Trade and the Right to Food, Dialogue on Globalization, Occasional Paper, No. 46. (Friedrich Ebert Stiftung, Geneva, 2009).
[806] See, P. McMichael, "Value-Chain Agriculture and Debt relations: Contradictory Outcomes", Third World Quarterly, Vol 34. No 4, (2013):671-690; United Nations Conference on Trade and Development, "World Investment Report 2009: Transnational Corporations, Agricultural Production and Development" (United Nations, New York, USA: 2009).

Another critic of the Liberal School relates to its assumption that markets are perfect.[807] This assumption is based on the view that in the absence of market competition, efficiency gains are not going to accrue from specialization. The coming to the picture of global value-chains hence refutes the liberal assumption that there is perfect competition in the market. This is because there is a high concentration of agribusiness MNCs in the global value-chain such that they have made the market uncompetitive and distorted.[808] Even though economists consider a situation where four firms have control over 40% or less of the market to result in competitive markets while anything more than that will lead to inefficiency, the current ratio of agribusiness MNCs in the agricultural sector is much higher.[809] In this regard, four agribusinesses MNCs control 75-90% of the market for grain, as a result, rendering the market inefficient and uncompetitive.[810] Such a dominant position in the market has given these MNCs the power to manipulate the price further distorting the market and having an effect on developing countries that are, for the most part, price takers.[811] Moreover, especially since the 2007-2008 financial crisis, the agricultural sector has also seen an increase in transnational financial investments having a role in speculative financial capital as well as the price of land.[812]

Furthermore, the inefficiencies of the free trade theory are to be seen clearly with regard to its assumption of perfect mobility of labor and capital between different activities. The basis of this assumption connotes that in order for comparative advantage to accrue in specialization, factors of production need to switch from the production of one good to another. Trade theory furthermore considers that even though there might be switching costs associated with that, they are for the most part temporary.[813] Hence, the Liberal School contends that because of the benefits a State would get from specialization, it is able to compensate for the switching costs through, for instance, safety net policies.[814]

Critics[815] of this view have contested the fact that switching costs might not be that easy to compensate for, as propounded by the theory. The reason for this has to do with the fact that

[807] Schumacher, "Deconstructing the theory of comparative advantage", 83–105; Prasch, "Reassessing the theory of comparative advantage".
[808] ETC Group, "Who will feed us? Questions for the food and climate crises", Communiqué Issue No. 102 (2009); Jennifer Clapp & D. Fuchs, Corporate power in global Agrifood Governance, (MIT Press, Cambridge, USA: 2009).
[809] ETC Group, "Who will feed us? Questions for the food and climate crises"; Clapp & Fuchs, Corporate power in global Agrifood Governance.
[810] S. Murphy, "Concentrated market power and agricultural trade", Ecofair Trade Dialogue Discussion Paper, No. 1; S. Murphy, D. Burch & J. Clapp, Cereal Secrets: The World's Largest Grain Traders and Global Agriculture, Oxfam Research Reports, (Oxfam, Oxford, UK: 2012).
[811] C.G. Gonzalez, "An environmental justice critique of comparative advantage: indigenous peoples, trade policy, and the Mexican neoliberal economic reforms", University of Pennsylvania Journal of International Law, Vol. 32. No. 2: (2011): 723–803.
[812] J. Ghosh, "The Unnatural Coupling: Food and Global Finance", Journal of Agrarian Change, Vol. 10. No. 1, (2010): 72–86; S.R. Isakson, "Food and Finance: The Financial Transformation of Agro-food Supply Chains," Journal of Peasant Studies, vol. 41, No.5, (2014): 749–775.
[813] See, Clap, "Trade Liberalization and Food Security: Examining the Linkages,".
[814] Ibid.
[815] See, H.J. Chang & I. Grabel, Reclaiming development: An Economic Policy Handbook for Activists and Policymakers, (Zed Books, London: 2004); I. Fletcher, "Dubious Assumptions of the theory of Comparative Advantage", Real World Economics Review, (2010): 94–105.

for people who have been displaced from their activities, the costs may not always be economic in that there are also psychological, physical as well as re-skilling costs in pursuit of employment.[816] Applying the same critic in the agricultural sector, the fact that the sector is highly dependent on the environment in that the production period for seeds takes a long time and the fact that it provides main means of employment locally, makes the sector highly inflexible.[817] This is because, in the short-run, switching activities in the agricultural sector as well as between the agricultural and other sectors will be costly.[818] In this regard, farmers that have been displaced as a result of switching activity may find it difficult to secure non-farm employment. As such, due to these reasons, farmers are less likely to get compensated by the State due to, for instance, lack of funding to support the provision of social safety net programs in developing countries.[819]

The other shortcoming of the free trade theory in relation to the agricultural sector has to do with its inability to incorporate externalities into the final price of goods.[820] Notwithstanding the fact that efficient resource allocation should take into consideration all costs in the final price of the good produced, the theory fails to integrate external costs and benefits in the final calculation. Similarly, in the agricultural sector, the theory forgoes externalities in relation to environmental costs.[821] As such, countries that specialize in agricultural production as per their comparative advantage rely on large-scale and export-oriented farming focused on monocultures. As will be discussed further under chapter five, such costs have accrued from large-scale utilization of land due to the use of, for instance, tropical forests for the production of export crop and production focused on large-scale monoculture farming practices which have serious environmental consequences (huge GHG emsission), leading to land depletion as well as loss in biodiversity.[822] Additionally, the free trade assumption also fails to take into account health-related impacts of the growth in processed food which is linked with serious

[816] For more, see, Chang & Grabel, Reclaiming development: An Economic Policy Handbook for Activists and Policymakers; Fletcher, "Dubious Assumptions of the theory of Comparative Advantage", 94–105.
[817] See, H.J. Chang, "Rethinking Public Policy in Agriculture: Lessons from Distant and Recent History", (FAO Rome: 2009).
[818] FAO, Trade Reforms and Food Security: Conceptualizing the Linkages, (Rome, 2003); Chang, "Rethinking Public Policy in Agriculture: Lessons from Distant and Recent History".
[819] W. Sachs & T. Santarius et al., Slow Trade - Sound Farming: A Multilateral Framework for Sustainable Markets in Agriculture, Ecofair Trade Dialogue, (Heinrich Böll Foundation and MISEREOR 2007); Tania Murry Li, Exit from Agriculture: A Step Forward or a Step Backward for the Rural Poor? Journal of Peasant Studies, Vol. 36, No. 3, (2009), N. Fuchs & U. Hoffmann, "Ensuring Food Security and Environmental Resilience: The Need for Supportive Agricultural Trade Rules, UNCTAD Trade and Environment Review," (UNCTAD, Geneva, Switzerland: 2013); FAO, Trade Reforms and Food Security: Conceptualizing the Linkages; Chang, "Rethinking Public Policy in Agriculture: Lessons from Distant and Recent History.
[820] H.E. Daly, "The perils of Free Trade, Scientific American", Vol. 269, No. 5, (1993): 50–57; Fletcher, "Dubious Assumptions of the Theory of Comparative Advantage", 94–105; Prasch, "Reassessing the theory of comparative advantage", 37–56.
[821] Daly, "The perils of Free Trade, Scientific American", 50–57; Fletcher, "Dubious Assumptions of the Theory of Comparative Advantage" 94–105; Prasch, "Reassessing the theory of comparative advantage", 37–56.
[822] See, G.K. MacDonald, K. Brauman, et al., "Rethinking Agricultural Trade Relationships in an Era of Globalization", BioScience, Vol. 65, Issue. 3, (2015): 275–389; T.W. Hertel, N. Ramankutty & U.C. Baldos, "Global Market Integration Increases Likelihood that a Future African Green Revolution Could Increase Crop Land Use and CO2 Emissions", Proceedings of the National Academy of Sciences, Vol. 111. No. 38, (2014): 13799–13804; Tara Garnett, et al., Sustainable Intensification in Agriculture: Premises and Policies, Science, Vol. 34, No. 6141, (2013): 33–34.

diet-related diseases has additionally been a call for concern.[823] As such, for these reasons, the agricultural sustainability of food systems exerts a direct effect on food security.

Another critic raised relates to a core liberal principle which contends that all countries stand to gain from engagement in trade leading to higher income and increased welfare.[824] Critics, however, have contended otherwise by arguing that efficiency gains are not evenly distributed among countries as such resulting in some winners and losers.[825] For this reason, it can be disputed whether participation in trade alone will lead to material gains.[826] Critics[827] have questioned especially the tendency of international trade to focus on specialization based on short-term conditions. This means that because the decision of specialization is made on short-term conditions, it will have a long-term effect on countries potential to benefit from trade.[828] The reason for this is that in the long-run, this puts a bottleneck on countries by making it difficult to enter the high-value market due to concentration on primary goods. Moreover, it becomes difficult for these countries to enter into manufacturing and processing further constraining their growth potential.[829]

As this section has tried to highlight when applied to the agricultural sector, the main assumptions upon which pro-trade liberal theory stands have shortcomings, which the Liberal School has not taken into consideration. Hence, in the subsequent discussion, these shortcomings will be explored further in more detail in relation to the right to food (Article 11(1)) of the ICESCR.

[823] Clapp, "Trade Liberalization and Food Security: Examining the Linkages" 11-20; Chang, "Rethinking Public Policy in Agriculture: Lessons from Distant and Recent History"; G. Rayner, C. Hawkes et al., "Trade Liberalization and the Diet Transition: A Public Health Response", Health Promotion International, Vol. 21: (2006): 67–74.
[824] See, Pascal Lamy, "Comparative Advantage is Dead? Not at All, Lamy Tells Paris Economists", Speech 12 April. Accessed on 20/03/2018, available at, http://www.wto.org/english/news_e/sppl_e/ sppl152_e.htm.
[825] See, Schumacher, "Deconstructing the Theory of Comparative Advantage", 83–105; A.F. McCalla, "Protectionism in International Agricultural Trade", Agricultural History, Vol 43, No. 3 (1969): 1850–1968.
[826] See, Daly, The Perils of Free Trade, Scientific American," 51.
[827] See Chang & Irene, Reclaiming Development: An Economic Policy Handbook for Activists and Policymakers, (Zed Books, 2004): 61-63.
[828] Ibid.
[829] Ibid.

3.2. GATT and Agricultural Trade

3.2.1. Over viewing the GATT Trade Agenda

The GATT was established in 1947 whereas it came into force on January 1st, 1948 after the unsuccessful attempt to establish the International Trade Organization (henceforth, ITO).[830] The ITO was supposed to serve as a specialized agency of the United Nations (UN) similar to the International Monetary Fund (IMF) and the then International Bank for Reconstruction and Development (World Bank).[831] However, as these UN institutions did not cover the regulation of trade, it was recognized that a trade organization that would regulate trade in the Post-Second World War period was needed. With this intention in mind, negotiations started in Havana, Cuba through 1946-1948 resulting in the Havana Charter[832], which was adopted as a comprehensive document to regulate world trade.

While these negotiations were taking place, major powers of the world had organized a multilateral negotiation for the reduction of tariffs. Hence, the GATT was completed in 1947 to be a tariffs reduction multilateral treaty rather than an international organization.[833] In this regard, in 1946 when the negotiations began, the trade rules of the ITO relating to tariff concessions were used during the initial negotiations. Therefore, the rules adopted from the ITO and tariff concessions exchanged during the negotiations became known as the General Agreement on Tariffs and Trade.[834] As a result, during the United Nations Conference on Trade and Employment, countries reached an agreement to a draft of the ITO.[835] It was, however, difficult to get countries to ratify it. This was the case for instance with the U.S. which had refused to seek congressional ratification for the Havana Charter.[836] As such, this meant that without the participation of a big commercial power like the U.S., the fate of the ITO was dead.

Consequently, the GATT was there to fill the vacuum created after the death of the ITO to regulate international trade in the Post WWII period. Hence, the GATT was adopted as a mechanism aimed at the elimination of protectionist trade barriers which stalled free trade during the Second World-War (1939-1945). The agreement envisaged to bring about a transparent framework through which barriers to trade will be eliminated. Thus, the GATT was established in 1947 with the adoption of the Protocol of Provisional Application of the General Agreement on Tariffs and Trade.[837] It was established with the aim of bringing about

[830] Kenneth Dam, The GATT: Law and International Economic Organization, (University of Chicago Press 1977): 11.
[831] See, General Agreement on Tariffs and Trade, "GATT: What It Is, What It Does", (1992).
[832] See, United Nations Conference on Trade and Employment, "Havana charter for an International Trade Organization", (March 24, 1948).
[833] See, John H. Jackson, "The General Agreement on Tariffs and Trade in United States Domestic Law", Vol. 66 No. 2, Michigan Law Review, (1967):249-270. The GATT was established in 1947, it had 23 original participating States.
[834] General Agreement on Tariffs and Trade, "GATT: What It Is, What It Does", 3; Dam, "The GATT: Law and International Economic Organization", 11.
[835] General Agreement on Tariffs and Trade, "GATT: What It Is, What It Does", 3.
[836] Ibid.
[837] General Agreement on Tariffs and Trade, (October 30, 1947); R. Sharma, "Agriculture in the GATT: A Historical Account" in Yon Fernández de Larrinoa Arcal and Materne Maetz, Multilateral Trade Negotiations in

a reduction in government intervention and fostering trade liberalization in goods, *inter alia*, through the elimination of quantitative import restriction, export subsidies, and trade barriers. As such, the main focus of the GATT had been trade liberalization by focusing mainly on industrial goods.

With this objective in mind, the agreement was adopted on the basis of four principles. The first principle, as incorporated in Article 1, vowed to eliminate discrimination among the participating MS by requiring the extension of the same favor, privilege or immunity granted to products originating from or destined to a MS, to also be granted to like products coming from or destined to other MS without discrimination (Most Favored Nation Principle).[838] Underlying this principle of the GATT was the theory of comparative advantage which stipulates, as already indicated above, that States create wealth given they specialize in what they produce best. In this regard, while MS were granted the right to receive similar treatment from other MS, this obligation also entailed the "reciprocity principle".[839] The reciprocity principle implied that MS were required to reciprocate (should give and take) trade concessions towards the lowering of tariffs and other barriers to trade in the world.[840]

Under the second pillar, participating states were bound to a Schedule of Concession (SC). This implied that under a negotiated SC, a ceiling was set as to the maximum tariff duty rate MS were allowed to apply against imports coming from other MS.[841] Hence, MS undertook commitments by stating the maximum level of import duty or any other restrictions they would impose on imports. The commitments, made by MS were thereafter recorded in the national schedules of a country hence becoming part of a country's obligation under the GATT.[842] In line with the afore-discussed MFN principle, the principle applied to all MS of the GATT.

Moreover, the GATT had also abolished special National Treatment under its third pillar.[843] The National Treatment principle of the GATT implies that after a particular good has entered the market of a country from another MS, the good so imported should be treated the same

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Agriculture: A Resource Manual, Food and Agricultural Organization of the United Nations (Rome, Italy 2000). The GATT was adopted after the failure to establish the International Trade Organization (ITO). As a result of this, after being adopted in 1947, the GATT was governed by "provisional" and "interim" measures, without a formal organization to enforce it. Such provisional measures continued until the conclusion of the Uruguay Round trade negotiations which culminated in the establishment of the World Trade Organization (WTO). By the time it was established, GATT Member States included, the Governments of the Commonwealth of Australia, the Kingdom of Belgium, the United States of Brazil, Burma, Canada, Ceylon, the Republic of Chile, the Republic of China, the Republic of Cuba, the Czechoslovak Republic, the French Republic, India, Lebanon, the Grand-Duchy of Luxemburg, the Kingdom of the Netherlands, New Zealand, the Kingdom of Norway, Pakistan, Southern Rhodesia, Syria, the Union of South Africa, the United Kingdom of Great Britain and Northern Ireland, and the United States of America signed the GATT in 1947.

[838] See, General Agreement on Tariffs and Trade, (October 30, 1947): Article 1.

[839] Ibid, Preamble.

[840] Ibid. The preamble provides the desire of the contracting parties to enter "reciprocal and mutually advantageous arrangements directed to the substantial reduction of tariffs and other barriers to trade".

[841] Ibid, Article II; Kele Onyejekwe, GATT, Agriculture, and Developing Countries, (The National Agricultural Law Center, University of Arkansas, 1993): 86-87.

[842] Ibid.

[843] See, General Agreement on Tariffs and Trade, (October 30, 1947): Article 3.

way as the goods produced in the importing country.[844] As such, similar to the MFN principle under which the products coming from different MS are to be treated alike, the National Treatment principle extended this to the products coming from the importing country.[845] This constitutes a basic pillar of the GATT under which a locally produced and imported goods are to be granted similar treatment after the good in question has entered the market.[846]

With the intention of harmonizing the system of import protection, the fourth pillar of the GATT rested on the elimination of all Non-Trade Barriers (henceforth, NTB) which had trade-distorting effect such as quotas except in some sectors (mainly agriculture).[847] In this regard, the Agreement sought to bring about discipline in international trade by introducing a tariffs - only regime.[848] Hence, the GATT introduced a ban on NTB as stipulated under Article XI. In this regard, the provision vowed to prevent the introduction of NTB by MS which would restrain the trade liberalization agenda of the Agreement. Hence, the provision provided,

> "no prohibitions or restrictions other than duties, taxes or other charges, whether made effective through quotas, import or export licenses or other measures shall be instituted or maintained by any contracting party" (Emphasis added). [849]

Therefore, the GATT introduced "tariffication"[850] under which the protection of a domestic industry was to be carried out only through tariffs. A tariffs-only regime was preferred for the fact that tariffs provide a visible system of protection when compared to other forms of protection which are difficult to identify.[851]

As such, this section has tried to briefly highlight, the main pillars upon which the Agreement stood included, the MFN principle under which privileges or immunity granted to products coming from a MS, are to automatically be extended to like products arriving from other MS, a ban on quantitative import restrictions and, national treatment which refers to the prohibition on differential treatment given to products imported from different countries once

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[844] Ibid.
[845] General Agreement on Tariffs and Trade, The WTO Agreement Series, (World Trade Organization, Switzerland, Geneva): 1-5.
[846] Ibid.
[847] Ibid, XI
[848] See, Sharma, "Agriculture in the GATT: A Historical Account"; General Agreement on Tariffs and Trade, The WTO Agreement Series, 1-5.
[849] See, General Agreement on Tariffs and Trade, (October 30, 1947): Article XI. Moreover, Articles XXII of the GATT covers mechanisms of dispute settlement. Article XI gives MS the opportunity to engage in consultation to resolve their dispute. However, if the dispute is not solved by negotiation, MS can resort to invoking Article XXIII which allowed MS the right to submit a complaint in writing when they deem that a contracting party's action is contrary to the intent of the Agreement. In this regard, Article XXIII may be invoked, when a MS makes the claim that a benefit accruing to it under the General Agreement has either been nullified or impaired by another member because of which it has suffered some detriment. Given this, MS acting as a group are required to investigate the case and to come up with recommendations/rulings. It was only when the MS are of the opinion that the matter is of a serious nature that they will authorize the complainant to take retaliatory action against the respondent with a view compensate the complainant for its damages.
[850] "The tariffication process involves taking the difference between a representative world price for the product in question and a representative domestic price to calculate the protective value of the non-tariff barrier", for more, see Miguel Antonio Figueroa, "The GATT and Agriculture: Past, Present, and Future", Kansas Journal of Law and Public Policy 93 (1995):97.
[851] Onyejekwe, "GATT, Agriculture, and Developing Countries", 86-87.

a good imported has reached domestic the market, a tariffs-only regime through the elimination of trade-distorting NTBs as well as tariff bindings to which MS showed their commitment regarding the maximum amount of import duty or other restriction they were willing to impose on imports.

3.2.2. Prelude to Agricultural Trade Liberalization: Protectionism Unwraps

While the above has provided a brief discussion about the basic tenants of the GATT as regards trade in goods, the section below will assess in detail the place of agriculture as provided under the Agreement.

Trade in agriculture had occupied an unclear position in international endeavors on free trade.[852] Even though agricultural trade was not an integral part of the multilateral rules on trade, agriculture was given a recognition - save an unclear one - under the GATT in 1947.[853] This was because agriculture was dealt with as an exception over which the rules of the multilateral system did not apply owing to the exceptional position agriculture was given especially in advanced economies.[854] This was due to the fact that food security concerns, as will be discussed in subsequent sections, had served as a basis for the exclusion of agriculture from some of the rules of the multilateral trading system. As such, agriculture was treated as an exception to the GATT rules especially in two regards, subsidies and quantitative restrictions.[855]

This said, however, at the time, the countries associated with GATT had experienced wartime food shortages which had led to their dependence on food imports culminating in their weak self-sufficiency.[856] With this in mind, government intervention was deemed important so as to bring about stability in the agricultural sector, which was susceptible to price fluctuations as such culminating in the loss of earnings derived from farming (due to the fast pace with which production was increasing compared to demand).[857] For this reason, MS were committed to bringing about stabilization in domestic markets including in farming.[858]

Consequently, in the absence of an international trading regime before the coming to the picture of the GATT, both developing and developed countries utilized measures aimed at the protection of their agricultural sectors. For instance, in the 1950s and 1960s, developing countries were advised to develop their manufacturing sectors through Import Substitution

[852] Chris Downes, "Must the Losers of Free Trade Go Hungry: Reconciling WTO Obligations and the Right to Food", Virginia Journal of International Law, Vol. 47.3, (2007): 630.
[853] Downes, Must the Losers of Free Trade Go Hungry", 630.
[854] FAO, "Multilateral Trade Negotiations in Agriculture: A Resource Manual", (2000).
[855] Sharma, "Agriculture in the GATT: A Historical Account".
[856] Jon G. Filipek, "Agriculture in a World of Comparative Advantage: The Prospects for Farm Trade Liberalization in the Uruguay Round of GATT Negotiations", Harvard International Law Journal, Vol. 30, (1989):123-129.
[857] Filipek, Agriculture in a World of Comparative Advantage", 123-129.
[858] Krugman & Obstfeld, International Economics-Theory and Policy, 232. The presence of strong lobbies supported by big producers has led to the entrenchment of protectionist policies at the time.

Industrialization (ISI).[859] In this regard, developing countries were encouraged to diversify their economies so as to minimize their dependence on a few primary commodities.[860] This task was to be completed through heavy taxation of the agricultural sector as an integral part of their import substitution strategies so as to boost industrialization.[861] Therefore, the agricultural sector was taxed to support industrialization which was concentrated in the cities. As such, developing countries with the aim of maximizing revenue had resorted to the transfer of income from rural farmers to urban consumers (taxpayers) through the imposition of taxes on agricultural imports as well as subsidies on exports.[862] This was the trend until it was recognized that manufacturing protectionism through ISI had its drawbacks.[863] On the other hand, developed countries during this period had utilized several policies to promote their agricultural production; *inter alia*, import tariffs, export subsidies, and non-tariff barriers.[864]

Hence, the introduction of heavy protectionist policies in the agricultural sector can characterize the global context for both developing as well as developed countries during this period (1950's and 60's).[865] At this junction, it will be vital to highlight that even though the agricultural sector was subjected to protectionist policies in the post-WWII period, it will have taken several decades before the start of the Uruguay Round negotiations which culminated among other things, in the establishment of the WTO and the adoption of the AOA in 1994.

[859] R. Prebisch, The Economic Development of Latin America and its Principal Problems, (United Nations Department of Economic Affairs, New York: 1950); Michael P. Todaro, Economic Development (Addison Wesley,U.S.: 2000): 498-509, "The model called for rapid industrialization through the promotion of key domestic industries that would be shielded from international competition, at least during their infancy".

[860] Ibid.

[861] FAO, "The State of Food and Agriculture: Agricultural Trade and Poverty, Can Trade Work For the Poor?", FAO Agricultural Series, No. 36 (Rome, Food and Agriculture Organization of the United Nations, 2005):26ff; The World Bank, World Development Report: Agriculture for development, 98. In a study that included 16 of today's developing countries from the 1960s to mid-1980s, average direct taxation was estimated at 12 percent of agricultural producer prices and indirect taxes at 24 percent. In this regard, indirect taxes mainly through industrial protection and currency overvaluation on agriculture were three times higher when compared to direct agricultural taxes.

[862] T. Scitovsky, et al, Industry and Trade in Some Developing Countries: A Comparative Study, (Oxford University Press, Oxford: 1970); Constantine Michalopoulous, "Trade and Development in the GATT and WTO: The Role of Special and Differential Treatment for Developing Countries", Working Paper, No. 2388, (Development Economics Research Group on International Trade, World Bank, 2000).

[863] Ibid.

[864] Sanoussi Bilal, "Agriculture in a Globalising World Economy", In Negotiating the Future of Agricultural Policies; Agricultural Trade And the Millennium WTO Round (Sanoussi Bilal & Pavlos Pezaros Eds., 2000):1; World Bank, World Development Report: Agriculture for Development, 123; Anderson & Will, Agricultural Trade Reform and the Doha Development Agenda. In this regard, according to a study, the global costs of trade tariffs and subsidies would reach about $100 billion to $300 billion a year by 2015.

[865] Bilal, "Agriculture in a Globalising World Economy"; Scitovsky, et al, Industry and Trade in Some Developing Countries: A Comparative Study.

3.2.3. The Unclear Position of Agriculture Under the GATT

When GATT was established in 1947, among the negotiating parties, the interests of the U.S. took center stage in that the agreement mainly sought to protect U.S. agricultural programs against the possibility of being dismantled by its provisions.[866] This happened mainly because a world trade organization without participation from the strongest economic power at the time would have been unthinkable.[867] As such, the provisions were written down to be in congruence mainly with then existing rules in the U.S.[868]

This said, how was agriculture treated under the GATT? In the GATT, agriculture was dealt with in a special manner when compared to manufactured goods. This was most vivid with regard to the rules which applied to agriculture in relation to export subsidies and quantitative import restrictions. Firstly, the agricultural "exceptionalism" was present with regard to the provision of subsidies.[869] This has been because, for one, the GATT rules on subsidies were weakened to accommodate for trade in agriculture. The reason was due to the fact that the original GATT provision did not prohibit outright the introduction of domestic as well as export subsidies.[870] MS were only required to provide a report about, "any subsidy, including any form of income or price support, which operated directly or indirectly to increase exports of any product from, or to reduce imports of any product into its territory, to other parties".[871] Hence, MS were only obliged to issue a notification in writing as regards the extent and amount of subsidies they intend to employ including the expected effects. It was only when the State Party in question is of the opinion that the subsidies so introduced would have a detrimental effect on other contracting parties that, "the contracting party granting the subsidy shall, upon request, discuss with the other contracting parties, the possibility of limiting the subsidization".[872]

In 1955 however, Article XVI was expanded with due recognition of the negative effects of export subsidies on international trade as provided under Article XVI:2. Moreover, Article XVI: 3 required MS to avoid the introduction and use of export subsidies on the export of primary products rather than banning subsidies altogether.[873] In this regard, the provision stated specifically that,

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[866] For more, see, William A. Brown, The United States and the Restoration of World Trade: An Analysis and Appraisal of the ITO Charter and the General Agreement on Tariffs and Trade (1950): 22-28.
[867] This had already been the case in the ITO where the U.S. refusal for seek congressional ratification, resulted in its death.
[868] Dale, Agriculture and the GATT: Rewriting the Rules, 103
[869] Peggy A. Clarke, The Future of Food Subsidies", American Society of International Law Vol. 101, (2007):109.
[870] See, Sharma, "Agriculture in the GATT: A Historical Account".
[871] See, General Agreement on Tariffs and Trade, (October 30, 1947): Article XVI:1.
[872] Ibid.
[873] In this regard, in an attempt to utilize Article XVI (3) the GATT Subsidies Code was adopted which came out of the Tokyo Round. However, the existence of disagreement surrounds the terms used such as "equitable market share" and "representative period". Even though attempts were made to define the agricultural export subsidies provisions of the Subsidies Code negotiated, for example in the Kennedy Round, it failed. As such, disagreements over this provision have made it unworkable. For more, see, Dale, Agriculture and the GATT: Rewriting the Rules,106; Fred H. Sanderson, Agriculture and International Trade, vol. 36 No.51 (1988); John H.

> "contracting parties should avoid the use of export subsidies on primary product exports. However, given a contracting party grants any form of subsidy with the aim of increasing the export of the primary product from its territory, such subsidy shall not be applied in a manner which leads to the contracting party having more than an equitable share of world export trade in that product".[874]

However, Article XVI: 4 prohibited the introduction of export subsidies on non-primary products. As such, the special treatment of agriculture could be seen clearly with regard to subsidies in that the GATT only required a MS which sought to introduce subsidies either directly or indirectly to ascertain that such measure will not lead to the State Party having more than an equitable share of world export in the product concerned.[875] The possibility of introduction of subsidies on non-primary products, however, was prohibited owing to the special treatment agriculture was granted. This implied that GATT's rules on export subsidies were lax for agriculture than they were for industrial goods. These were the only provisions that mainly dealt with agriculture as the GATT had not put in place clear rules for agricultural trade.

This said, what were the GATT rules dealing with quantitative import restrictions in relation to agriculture? The second exception provided by GATT as regards agriculture concerned quantitative import restrictions.[876] In this regard, Article XI and XIII were the main exceptions when it comes to agriculture. Firstly, Article XI of GATT dealt with agriculture as an exception to the obligation MS have to eliminate quantitative import restrictions (quotas).[877] This is mainly because, Article XI provides that the obligation to eliminate quantitative import restrictions does not apply to temporary import restrictions employed by MS in order to alleviate food shortages which are essential for the exporting country,[878] those import and export restrictions needed for the application of standards or regulations for the classification grading or marketing of commodities,[879] and import restrictions on agricultural products necessary for the enforcement of governmental measures.[880] While this completed

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Jackson, The World Trading System: Law and Policy of International Economic Relations 27 (1989); John H. Jackson, GATT and the Future of International Trade Institutions", Brook Journal of International Law 18 (1992).

[874] See, General Agreement on Tariffs and Trade, (October 30, 1947): Article XVI (3). This GATT ban on export subsidies was effective from 1 January 1958 or the earliest practicable date thereafter. See also, GATT agreement, Annex 1, A primary product is defined under Annex I (Notes and Supplementary Provisions) of the 1947 GATT, "to be any product of farm, forest or fishery, or any mineral, in its natural form or which has undergone such processing as is customarily required to prepare it for marketing in substantial volume in international trade". GATT's different treatment between primary and non-primary products had created controversy. In response, contracting parties took action before this provision was to go into effect. As such, in 1962, a declaration applying this paragraph was opened for signature by the contracting parties, See, Declaration Giving Effect to the Provisions of Article XV/ (4), 1960, Agreement, No. 69, Basic Instruments & Selected Documents (GATT, Geneva, Switzerland), 9th Supp., 1961.

[875] This principle was applied in 1958 in relation to a dispute that was brought before the dispute settlement body by Australia against French export subsidies that were applied on wheat: France, Assistance to Wheat Exports and Wheat Flour, BISD, 7th. Supp. (1959).

[876] General Agreement on Tariffs and Trade, (October 30, 1947), article XI.

[877] Ibid.

[878] Ibid, Article XI. (2)(a).

[879] Ibid, Article XI (2)(b).

[880] Ibid, Article XI (2)(c).

the exceptions granted to agriculture from the GATT discipline, Article XII provided GATT exceptions for balance of payment difficulties.[881]

Moreover, Article XI(2)(C) of GATT allowed the employment by MS of farm quotas on the import of agricultural commodities with the intention of protecting farm programs.[882] However, the imposition of import quotas was only allowed given the production of the product in question was also restricted domestically and given the production restriction is done to the same extent as the imported product.[883] This provision was included so as to make a total ban on imports more difficult. However, these exceptions were seldom employed because, for one, only a few cases which use these exceptions were brought before the GATT and secondly due to the fact that the GATT Panel applied them narrowly.[884]

While this was the general trend, a noteworthy case law[885] took place in 1951 in which the U.S. was found to be in breach of its obligation under Article XI(2)(C) by imposing restrictions on dairy imports coming from Europe. This said however, the import restriction was imposed without the U.S. proportionally restricting its domestic production.[886] This was a result of the complaint brought by Holland against the U.S., in which the Netherlands challenged that the U.S. introduction of restrictions on milk imports was in violation of Article XI.2 of the Agreement.[887]

Irrespective of the inconclusive finding,[888] however, the U.S. Congress resorted to an amendment of its Agricultural Adjustment Act (AAC) under which the executive organ was granted the right to restrict agricultural imports which interfered with domestic farm programs.[889] However, the proposed legislation had failed to pass because of which the U.S. was forced to accept a GATT decision, which authorized the Netherlands to retaliate.[890] Nevertheless, the case made precedence in that the U.S. - by threatening to withdraw from the GATT unless its wish was granted - asked and received a waiver of its obligations as regards

[881] Ibid, Article XII.
[882] Ibid, Article XI (2) (C). This exemption restricted imports of agricultural products which are designed to reinforce controls on domestic production or marketing of like or substitutable products, to facilitate the disposal of temporary surpluses of agricultural products, or to support domestic efforts to reduce animal production.
[883] Ibid, Article XI (2)(c).
[884] Christine Breining-kaufmann, "The Right to Food and Trade in Agriculture", in Thomas Cottier, Joost Pauwelyn and Elisabeth Bürgi (eds.), (Human Rights and International Trade, Oxford University Press, 2005).
[885] Decision of March 5, 1955, GATT B.I.S.D. (3d Supp.), (waiving the United States' GAIT Article XI obligations).
[886] See, Jackson, World Trade and the Law on GATT, 734; Decision of March 5, 1955, GATT B.I.S.D. (3d Supp.), (waiving the United States' GAIT Article XI obligations), The waiver moreover, enabled the United States to impose import quotas that were not connected to domestic production control programs. GATT Article XI does not prohibit the use of many other protectionist devices, such as quotas, price manipulations used in order to achieve quota like effects.
[887] Dairy products from Holland, BISD, Vol. II (1952))
[888] See for example, Joseph A McMahon, The WTO Agreement on Agriculture: A Commentary (Oxford: Oxford University Press, 2006): 2-5. In 1956, the Working Party was established with a view to assess the compatibility of the Treaty of Rome establishing the European Economic Community with the GATT expressed concern about the potentially restrictive effects of the Common Agricultural Policy however without providing a firm conclusion as regards its conformity with GATT obligations
[889] Jackson, World Trade and the Law on GATT, 733-734; Act of June 16, 1951, ch. 141, 8(b), 65 Stat. 72, 75 (amending section 22 of the Agriculture Adjustment Act).
[890] United States - Import Restriction on Dairy Products, BSIB, 1st Supp, 62-64(1953).

agricultural products including sugar, cotton, peanuts, tobacco, and dairy products under Article XI(2)(C).[891]

As such, as part of this waiver, the U.S. was able to introduce import quotas that were not allowed under its obligation in Article XI. This has allowed the U.S. and EU, which followed suit in 1963 as part of it's Common Agricultural Policy (CAP)[892], to impose import restrictions notwithstanding the requirements under Article XI of GATT.[893] This was due to the fact that the flexibilities under Article XI were not enough for countries like the U.S. to ensure the protection of its dairy sector.[894] This had transpired in protectionism and disputes leading to the isolation of agriculture from the process of trade liberalization at the time.[895] In a similar vein, as a response to this move by the U.S., other GATT MS had resorted to the introduction of import barriers hence putting the U.S. in a weaker negotiating position to challenge the actions of other MS.[896] Hence, the granting of this waiver had affected GATT's credibility.[897] The result after this has seen the proliferation of trade restrictions, which caused impediments to agricultural trade leading to hikes in price and to unclear benefits of protection. This has shown that the underlying problem for such protectionist policies lied beyond import measures which, for the most part, have been the main focus of the GATT.

As such, the two exceptions granted to agriculture, i.e., subsidies as well as quantitative import restrictions, were enough to keep agriculture out of the GATT. These exceptions gave MS the license to provide State support to their farmers, to provide border protection as they wished, and to export the surplus this generated through export subsidies.

[891] The waiver granted on 5 March 1955, exempted the measures taken pursuant to section 22 of the 'Agricultural Adjustment Act of 1933' from the discipline of Art XI. For more, see, F. Delcros, The Legal Status of Agriculture in the World Trade Organization: State of Play at the Start of the Negotiations, No, 36 Journal of World Trade (2002): 219–253; Sharma, "Agriculture in the GATT: A Historical Account". The waiver was an exception to exceptions in that it allowed the US to apply import restrictions without regard to such rules. This waiver, which thus discriminated against countries other than the US, has been a major source of continuing resentment by others and was used as an argument that the US was not serious about trade liberalization".

[892] See, M. Trebilcock & R. Howse, The Regulation of International Trade, (London & New York: 1999):247.

[893] William J. Davey, "The Rules for Agricultural Trade in GATT", in GATT and Trade Liberalization in Agriculture (Masayosi Homna et al. eds., 1993):3-6.

[894] See, Figueroa, The GATT and Agriculture: Past, Present, and Future, 93- 95.

[895] See, Kevin C. Kennedy, International Trade in Agriculture: Where We've Been, Where We Are, and Where We're Headed, Michigan State University College of Law, Vol. 10, 1 (2001); McMahon, The Uruguay Round and Agriculture: Charting a New Direction?, 411- 415.

[896] J. Jackson, World Trade and the Law of the GATT, Vol. 13.2, (1969):735.

[897] Ibid.

3.2.4. Competing National Interests: Agriculture under the Uruguay Round

3.2.4.1. The Lead Up to the Uruguay Round Trade Negotiations

As the above discussion has tried to show, prior to the start of the Uruguay Round trade negotiations, agriculture was substantially exempted from GATT rules. The result of this agricultural trade exemption, however, had led to strong State intervention in agriculture culminating in trade disputes among the participating Countries.[898] As such, when the Uruguay Round trade negotiations took place between 1986-1994[899], agriculture was high on the agenda mainly resulting from lack of compromise among the major powers in the eight rounds of negotiations that were held under the GATT.[900] As already highlighted, this was due to the different exemptions agriculture was put under. The fact that the rules of the multilateral system did not apply to agriculture had put agricultural markets in "disarray" at the time.[901]

The period (the 1970s and 80's), prior to the start of the Uruguay trade negotiations were characterized by State protectionist policies under which developed country MS provided support to the agricultural sector through the transfer of income from urban consumers as well as taxpayers to rural farmers and big agribusinesses.[902] This was mainly due to the fact that developed country MS of the GATT, provided subsidies for their producers which culminated in huge surpluses that needed to be dispossessed into world markets through the means of export subsidies. As such, the agricultural policies that operated at the time were tilted in favor of developed country agricultural producers (U.S. and EU)[903] at the expense of consumers. As such, the protectionist agricultural policies at the time resulted in an increase in both national as well as global food production hence leading to adequate supplies of food.[904] However, to the extent that strong State intervention had disrupted international

[898] In the 1950s, 23 percent of GATT cases involved agriculture, and from the early 1960s to the late 1980s, over 50 percent of GATT trade disputes resulted from agricultural trade. See for example, GATT Pasta Panel Report on U.S. Complaint Against European Community Subsidies, U.S. Import Wkly. (BNA). (1983) & U.S. Int'l Trade Commission, No. 1793, Review of the Effectiveness of Trade Dispute Settlement Under the GATT and Tokyo Round Agreements, app. I: 20-28.

[899] The Uruguay Round was launched in 1986 by the Punta del Este Ministerial Declaration in which the negotiating objectives of the Round were laid out.

[900] See, Filipek, Agriculture in a World of Comparative Advantage, 141-146. See also, Agreement on the Interpretation and Application of Articles VI, XVI, XXIII of the General Agreement on Tariffs and Trade, (April 12, 1979): 56.

[901] For more, see, D. G. Johnson, World Agriculture in Disarray, (London, Fontana/ Collins, 1973); Anne Oxford, "Food Security, Free Trade, and the Battle for the State", Journal of Law and international Relations, Vol. 11, No.2 (2015):48-63.

[902] See, Terence P. Stewart, The GATT Uruguay Round: A Negotiating History (1986-1992), (Kluwer Law and Taxation Publishers 1993); Ingolf Vogeler, The Myth of the Family Farm: Agribusiness Dominance of U.S. Agriculture (1981):147-194; Bill Winders, The Politics of Food Supply: US Agricultural Policy in the World Economy, (Yale University Press, New Haven: 2009).

[903] At this period, the amount of transfer of income from tax payers and consumers to farmers in OECD countries was close to 300 billion dollars. See, Organization for Economic Cooperation and Development (OECD), Agricultural Policies, Markets and Trade: Monitoring Outlook, (1991): 33; Davey, "The Rules for Agricultural Trade in GATT".

[904] Stewart, the GATT Uruguay Round: A Negotiating History (1986-1992); Vogeler, The Myth of the Family Farm: Agribusiness Dominance of U.S. Agriculture,147-194.

markets, the agricultural markets, especially in the 1970 and 1980s, were characterized by "disarray".[905]

On the other side of the spectrum, the pre-Uruguay Round years can be characterized by - as opposed to the policies in developed countries - the transfer of income from rural farmers to urban dwellers in developing countries.[906] The main modalities through which the transfer of income was undertaken were, the imposition of export subsidies on agriculture and subsidies on agricultural imports, while farmers received low payment from their State which was for the most part below the world price.[907] This said, however, as many developing countries could not afford the provision of such subsidies,[908] the distortions were most widespread in developed countries. As a result of this, developing countries mainly relied on the use of agricultural taxes.[909] Hence, as already implied, the world agricultural market at the time was characterized by export surplus which was dispossessed off through the provision of export subsidies.[910] Furthermore, in situations where domestic prices were not linked to world prices, the response as regards the changing international circumstances in supply and demand were mostly absent.[911] This, in turn, had made world market prices more unstable. Moreover, the reliance on export subsidies by the U.S. and EC had depressed world prices making them unstable.[912] The effect of protectionist policies mostly affected world agricultural producer and exporters. This culminated in the late 1980's in the "subsidies war" between the two major exporters of agricultural goods, U.S. and EC as both competed with each other to increase their world market shares in this area.[913]

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[905] See, Johnson, World Agriculture in Disarray; R. Tyers & K. Anderson, Disarray in World Food Markets: A Quantitative Assessment, (Cambridge University Press, Cambridge: 1992); A. Valdes & J. Zietz, Agricultural protection in OECD countries: Its Costs to Less Developed Countries", IFPRI Research Report Number 21. (Washington, DC, IFPRI, 1980).

[906] See, Stewart, the GATT Uruguay Round: A Negotiating History (1986-1992); Vogeler, The Myth of the Family Farm: Agribusiness Dominance of U.S. Agriculture, 134.

[907] Dale Hathaway & Merlinda Ingco, "Agricultural Liberalization and the Uruguay Round", in The Uruguay Round and The Developing Countries, World Bank Paper No. 307 (Will Martin & Alan Winters eds., 1995).

[908] In this regard, domestic agricultural supports in agriculture were minimal because developing countries considered agriculture as less important than industry in the competition for limited government funds and as an important source of revenue for industrialization. For more, see, Bilal, The Political Economy of Agricultural Policies and Negotiations; E.M. Young, World Hunger (1997); Gabriele Geier, Food Security Policy in Africa Between Disaster Relief and Structural Adjustment (1995).

[909] See, Ataman M Aksoy, "Global Agricultural Trade Policies", in Ataman M Aksoy & John C Beghin, eds, Global Agricultural Trade and Developing Countries (World Bank, Washington, DC: 2005)., Treatment of Developing Countires: Differential and More Favourable Treatment Reciprocity and Fuller Participation of Developing Countries, Decision Of 28 November 1979 (L/4903). "Enabling Clause" This was a decision by signatories to the GATT in 1979 which allowed derogations to the most-favored nation (non-discrimination) treatment in favor of developing countries mainly on products originating from developing countries, those concerning NTB, and Regional or global arrangements entered into amongst less-developed contracting parties.

[910] See, Sharma, "Agriculture in the GATT: A Historical Account". In this regard, as a result of domestic support and border protection, about 60 percent of the value of production in OECD countries in 1986-88 had led to increasing amounts of surplus production which could be disposed off through export subsidies.

[911] Ibid.

[912] World markets became unstable due to the fact that subsidies were political decisions and were highly unpredictable. Sharma, "Agriculture in the GATT: A Historical Account".

[913] Robert O'Brien, Subsidy Regulation and State Transformation in North America, The GATT and The E.U. (1997):132; Thomas J. Schoenbaum, Agricultural Trade Wars: A Threat to the GATT and Global Free Trade, in GATT and Trade Liberalization in Agriculture, (Masayosi Homna et al., eds., 1993).

The pre-Uruguay Round years characterized by strong state intervention in agriculture, as discussed above, coincided with the global fall in agricultural prices owing to strong State support provision in developed countries.[914] For developing countries, the 1980s saw the start of the Third World debt crisis.[915] As will be discussed in detail in the subsequent sections, the crisis had mainly affected those countries which were highly indebted and those most dependent on trade.[916] Hence, many of these countries sought assistance from International Financial Institutions (IFIs); the World Bank (WB) and the International Monetary Fund (IMF) so as to restructure their debts and be eligible for receiving loans.[917] The Structural Adjustment Policies (SAPs) which had to be implemented by the loan receiving countries required, among other things, the opening up of markets, elimination of State protection and spending in the agricultural sector, currency devaluation and privatization of State-owned enterprises.[918] Hence, the initial years before the Uruguay Round saw market liberalization in the economies of developing countries; a scenario which had opened these countries to the emergence of food riots - IMF Riots - in several developing countries.[919] The result of protectionist policies by the OECD[920] countries such as tariffs and NTBs had seen the exclusion of exports of developing countries while heavy reliance on domestic support measures, impeded on the competitiveness of developing country exports.[921] Consequently, the policies undertaken led to the dumping of agricultural surplus through imports mainly from the EU and the U.S that were being sold at below market level.[922] Consequently, developing country producers were affected by the low domestic price which served as a disincentive for agricultural production.[923] Hence, agricultural producers that made their living on agriculture were affected which made developing countries dependent on the provision of subsidized food imports.[924] As a result of these developments, even those countries which had a comparative advantage in agriculture could not export their commodities as much as they wanted hence constraining their source of revenue while those

[914] See, Food and Agriculture Organization, State of Food and Agriculture: Lessons from the Past 50 Years, (2000).
[915] Ibid.
[916] Ibid.
[917] Ibid; Walden Bello and Dark Victory, The United States and Global Poverty (1999); Sarah Anderson, Views From the South: The Effects of Globalization and the WTO on Third World Countries (Food First Books: 2000).
[918] Ibid.
[919] For more, see, Susan George, A Fate Worse than Debt: The World Financial Crisis and The Poor, (1990); James Thuo Gathii, Retelling Good Governance Narratives on Africa's Economic and Political Predicaments: Continuities and Discontinuities in Legal Outcomes Between Markets and States, Vill. Law Review (2000). These riots took place, for example in, Venezuela, the Dominican Republic, Morocco, Madagascar, and Zambia.
[920] The OECD is an intergovernmental economic organization which was established on Dec. 14, 1960, by 18 European Countries plus the United States and Canada. Over time, it has seen its membership grow to include members from South America and the Asia-Pacific region. It deals with economic and social policies.
[921] See, Stewart, the GATT Uruguay Round: A Negotiating History (1986-1992).
[922] For more, see, M.C. Hallberg, Policy for American Agriculture: Choices and Consequences, (1992); Kevin Watkins, Agricultural Trade and Food Security (1995).
[923] See, Food and Agriculture Organization, State of Food and Agriculture: Lessons from the Past 50 Years; Bello and Victory, The United States and Global Poverty; Sarah Anderson, "Views From the South: The Effects of Globalization and The WTO on Third World Countries" (Food First Publishers: 2000); Belinda Coote, The Trade Trap, (1996).
[924] Ibid.

that had no advantage in agriculture easily entered the world agricultural market aided by strong State support.[925]

As this section has tried to show, the immediate years after the establishment of the GATT, i.e., 1970s-1980s, were characterized by State protectionist policies in agriculture owing to the different exemptions agriculture was the subject of. This trend had especially affected developing country producers that could not participate in the market due to for one, lack of State ability and capacity to provide incentives. Secondly, the protectionist agricultural policies of developed countries had led to the dumping of cheap food commodities into the global market mainly taking a toll on agricultural producers in the global South. For this reason, the pre-Uruguay Round agricultural policies can be characterized by disputes in agricultural trade. In this regard, even though institutions of GATT were used to resolve these tensions, not much success was evidenced due to the exemptions that were operational.[926]

[925] Ibid.
[926] See, Sharma, "Agriculture in the GATT: A Historical Account". Of all the trade disputes submitted to the GATT dispute settlement process between 1980 and 1990, 60 percent were concerned with agriculture.

3.2.4.2. The Uruguay Negotiations: Competing Interests Surface

Bearing the above discussion in mind, when the Uruguay Round negotiations on trade began in 1986 in Punta del Este in Uruguay with the aim of amending the rules of the GATT, they were intended at bringing about greater agricultural market liberalization and at addressing those issues that had affected agricultural trade, *inter alia*, export subsidies, tariffs on imports, and domestic policies, under the GATT rules.[927] As such, agriculture was high on the agenda in the Uruguay Round and subject of numerous disagreements among the major powers.[928] It was hoped that the incorporation of agriculture into the multilateral trading system would bring about an end to the instability, imbalance, and uncertainty that had engulfed agricultural markets.[929] Nevertheless, given the fact that agriculture remained a sensitive area, it was onerous to reach an agreement.

The negotiations were dominated largely by the U.S. and then EC that claimed to have a great stake in agricultural trade given their comparative advantage in agriculture. Moreover, these countries had hoped to gain from an increase in export revenue resulting from a reduction in agricultural protectionism.[930] From the U.S. side, agricultural trade liberalization was to be achieved through a reduction and gradual elimination of trade-distorting domestic subsidies, the conversion of NTB into tariffs while the major issue of focus had been the elimination of export subsidies.[931] This was done in response to EC's heavy utilization of export subsidies to protect agricultural exports. As such, the main focus of the U.S. in the Uruguay Round was the abolition of the EC's export subsidies so as to enhance the country's export share in the global market for agriculture.[932] The U.S. position for agricultural trade liberalization was supported by the Cairns Group[933] which represented a group of 14 countries with major agricultural exports that are responsible for 25% of global agricultural exports.[934]

The EC on its part produced a proposal which sought to expand the negotiation away from an emphasis on export subsidies. As such, it proposed that an equal focus should be given to other areas of concern in agricultural trade including non-trade concerns such as food security

[927] GATT Ministerial Declaration on the Uruguay Round of Multilateral Trade Negotiations, (September 20, 1986).
[928] For more, see, Jackson, GATT and the Future of International Trade Institutions.
[929] See, Raj Bhala, World Agricultural Trade in Purgatory: The Uruguay Round Agriculture Agreement and Its Implications for the Doha Round, North Dakota Law Review, Vol. 79, (2003).
[930] See, Miguel Montana-Mora, International Law and International Relations Cheek to Cheek: An International Law/International Relations Perspective on the US/EC, Agricultural Export Subsidies Dispute, J. Int'l L. & Com. Reg. 1, 11 (1993).
[931] Ibid.
[932] See, Carlisle F. Runge, "The Assault on Agricultural Protectionism, Foreign Affairs", Vol. 67, No 1. (1988).
[933]The Cairns group, was established 1986 with the aim to engage in the collective efforts to reduce agricultural subsidies in world trade. The group includes agricultural exporters such as Argentina, Australia, Brazil, Canada, Chile, Colombia, Fiji, Hungary, Indonesia, Malaysia, New Zealand, the Philippines, Thailand and Uruguay which had advocated for, similar to the position held by the U.S. The elimination of import restrictions and export subsidies. These countries together were responsible for one fourth of total agricultural exports. Stewart The GATT Uruguay Round: A Negotiating History (1986-1992), 182-186.
[934] For more, See, M. Cody & A. Thacker, "Agricultural Trade Liberalization in the Doha Round: The Search for a Modalities Draft", Georgia Journal of International and Comparative Law, Vol. 33, (2005): 727.

as well as the dependence of the sector on weather conditions.[935] Japan, as a food importing country, supported the EC position in the negotiations by cautioning the importance of maintaining protectionist policies in agriculture for ensuring food security while simultaneously giving attention to non-economic concerns.[936]

As can be grasped from this discussion, the Uruguay Round trade negotiations were mainly dominated by the EC's and U.S. positions. The inability of these parties to reach an agreement, as both wanted to maximize their comparative advantage in competition with each other, had resulted in a lengthy negotiation process. As a consequence, recession hit these countries which led to drops in consumption and consequently to stagnation in the agricultural market.[937] Hence, faced with the dilemma of unsustainable budget and unprofitable farming, the U.S. (supported by the Cairns group) along with the EC and Japan launched the Uruguay Round in 1986.

In this regard, in an attempt to break the impasse, in 1991, the Draft Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations (Dunkel Draft) was prepared by then GATT Secretary General Arthur Dunkel.[938] The EC and U.S. were able to reach the Blair House Agreement[939] afterward. Hence, on the basis the Dunkel Draft and the Blair House Agreement, the Uruguay Round was finally concluded on December 3, 1993, after the parties to the Uruguay Round signed the Final Act embodying the results of the trade negotiations. As such, the Uruguay Negotiations were concluded with the adoption of the Marrakech Agreement, establishing the WTO[940] as the final act of the Uruguay Round of multilateral trade negotiations in 1994. As such, the Uruguay Round was completed in 1994 with 12 agreements annexed to it.[941] Among the agreements adopted, the AOA was one of the agreements that came out of the Round.[942] The AOA was introduced by taking the aforesaid issues into consideration.[943] This means that aside from GATT's emphasis on import tariffs, other measures that affect trade in agriculture such as subsidies on agricultural exports,

[935] See, Liane L. Heggy, "Free Trade Meets US Farm Policy: Life after the Uruguay Round", Law and Policy in International Business, (1994):1395.
[936] For more, see Runge, "The Assault on Agricultural Protectionism", 146.
[937] Filipek, "Agriculture in a World of Comparative Advantage", 125.
[938] See, Draft Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, GATT Doc. MTN.TNC/W/FA (Dec. 20, 1991).
[939] Blair House Agreement is a Memorandum of Understanding (MOU) agreed between the U.S. and EU on Oilseeds that was negotiated with the US during the GATT Uruguay Round negotiations in 1992, OECD, Glossary of Statistical Terms, Blair house Agreement, Last Updated, April 3/ 2013, Accessed on 5/05/2018, Available at, https://stats.oecd.org/glossary/detail.asp?ID=222.
[940] See, WTO Agreement: Marrakesh Agreement Establishing the World Trade Organization (April 15, 1994).
[941] At the end of the Uruguay negotiations, the Final Act of the negotiations was signed that culminated in the establishment of the World Trade Organization. The MS of the WTO adopted twelve agreements, *inter alia*, agreement on agriculture (AOA), sanitary and phytosanitary measures (SPS), textiles and clothing, technical barriers to trade (TBT), trade related investment measures (TRIMS), Trade Related Aspects of Intellectual Property Rights (TRIPs), antidumping laws, customs valuation, pre-shipment inspections, rules of origin, import licensing procedures, subsidies, countervailing duties, and safeguards. See, Figueroa, "The GATT and Agriculture: Past, Present, and Future", 97.
[942] GATT Trade Negotiations Comm. Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, MTN/FA (December 15, 1993). See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 2, Agreement (December 15, 1993), Daily Rep. for Executives (BNA) (Dec. 17, 1993).
[943] Ziegler & Golay et al, "The Fight for the Right to Food: Lessons Learned", 68 ff.

domestic agricultural policies as well as non-trade concerns, special and differential treatment for developing countries, were taken into account. The discussion below will scrutinize the Uruguay Round Agreement on Agriculture (URAOA) by mainly focusing on its three pillars; market access, export subsidies, and domestic support.

4. Disguised Protectionism: The Uruguay Round Agreement on Agriculture Comes to the Rescue?

As already discussed, prior to the Uruguay Round trade negotiations which were concluded much later than their due date, the rules of the multilateral trading system were of less relevance to agriculture. This had been due to the fact that agricultural trade was incorporated in the multilateral trading system with no major modifications introduced owing to the protectionist policies the sector was put under. Nevertheless, this changed with the adoption on the AOA as one of the agreements adopted at the end of the Uruguay Round negotiations. The AOA sought to change the protectionism that had engulfed the agricultural sector, by bringing to attention the "urgent need to bring more discipline and predictability to world agricultural trade".[944] As such, the AOA presents the first time since the creation of GATT in 1947 in which agricultural commodities have been integrated into the international trading system with clear rules.[945] Therefore, as already stated, the AOA was adopted in 1994 as one of the agreements that came out of the Uruguay Round trade negotiations.

Accordingly, AOA seeks to extend the liberalization process in agricultural trade by establishing "a fair and market-oriented agricultural trading system".[946] The AOA hence presented the first step towards bringing the above objective into reality.[947] Hence, with this aim in mind, the agreement has put three obligations on MS of the WTO so as to infuse the rules of the multilateral trading regime into agriculture; increase in market access, reduction in trade-distorting export subsidies and a lowering in domestic support measures.[948] This said, as will be argued later on, even though the adoption of the AOA represents a major breakthrough as regards the establishment of clear rules on agriculture in international trade, it can at the same time be contested that "...the same Agreement is a standing symbol of continued failure to integrate agricultural trade into the mainstream system".[949] The discussion below overviews the AOA by focusing mainly on the three obligations it puts on MS

[944] See, General Agreement on Tariffs and Trade, "Ministerial Declaration on the Uruguay Round", GATT doc. MIN. (December, 20 September 1986).
[945] Bilal, "Agriculture in a Globalising World Economy", 2.
[946] Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 410 (April 15, 1994).
[947] Victor Mosoti & Ambra Gobena, "International Trade Rules and the Agriculture Sector: Selected Implementation Issues", FAO Legislative Study 98, (Rome, FAO, 2007): 33-34.
[948] Ibid.
[949] Ibd, 39.

4.1. Expanding Market Access Under the AOA

What are the rules that guide the market access obligation of MS in the AOA? The AOA's obligation to increase market access refers to the rules and conditions under which agricultural goods can be imported into MS of the WTO. In this regard, the AOA aims to accomplish the task through the conversion of non-tariff import barriers[950] into tariffs[951] (tariffication)[952] with the exception of those non-tariff measures approved for health and safety reasons.[953] The resulting tariffs are then bound in the individual schedules of the respective countries.[954] Developing countries are given the choice of converting their Non Tariff Barriers (NTB) and unbound tariffs into bound tariffs.[955] In this regard, developed countries are obliged to reduce their tariffs by 36% during the base year (1995-2000) with a minimum reduction level of 15% on each product line.[956] With the aim of giving special and differential treatment, developing countries were put under lower bound tariff reduction obligation of 24% to be met over a period of ten years (1995-2004) with a 10% minimum reduction level for each product line.[957] Moreover, with the intention of ensuring that market access commitments are honored during the process of tariff reduction, the AOA requires MS to establish minimum market access quota for all agricultural products.[958]

In this regard, under the AOA, developed MS that have undergone the tariffication process (the conversion of NTB into tariffs) are allowed to take Special Safeguards Measures (SSG).[959] This implies that MS are authorized under the AOA to impose additional tariffs in response to import surges or drops in price. As such, MS can employ additional tariffs of up

[950] Non-tariff import restrictions are thought to be more trade distorting and less transparent than their tariff equivalents. Such Non Tariff Barriers include quotas, embargoes, variable import levies, minimum import prices, and non-tariff measures maintained by state enterprises. See, Dale E. McNiel, "Agricultural Trade Symposium: Furthering the Reforms of Agricultural Policies in the Millennium Round", Minn. J. Global Trade (2000): 56-58; FAO, The State of Food and Agriculture, Agricultural Trade and Poverty: Can Trade Work for The Poor?, 38 ff.

[951] Tariffs refer to "a direct tax on the importation of goods which make them less price competitive than domestic products", Such measures refer to border measures that include tariffs, quotas and other import limiting measures. See, D. Crane, A Dictionary of Canadian Economics, (1980).

[952] Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 4(2),

[953] Ibid.

[954] See, GATT Doc MTN.GNG/MA/W/24 (20 December 1993) ('Modalities'). The Agreement on Agriculture is supplemented by the Modalities for the Establishment of Specific Binding Commitments under the Reform Program. The Modalities for Binding Commitments provides rules as regards the determination by governments of their specific commitments. Once these commitments were calculated, they were bound in the member's Schedule.

[955] FAO, The State of Food and Agriculture, Agricultural Trade and Poverty: Can Trade Work For The Poor?, 39. The resulting tariffs are called ceiling bindings.

[956] Ian Sturgess, The Liberalisation Process in International Agricultural Trade: Market Access and Export Subsidies, in Negotiating the Future of Agricultural Policies: Agricultural Trade and The Millennium WTO Round 135, 139 (Sanoussi Bilal & Pavlos Pezaros eds., 2000): 147.

[957] Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 15(2).

[958] World Trade Organization, Understanding the WTO-Agriculture: Fairer Markets for Farmers, http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm3_e.htm. Accessed on 12/04/2018. These market access quotas are also called "tariff-rate quotas" (TRQs) and are expected to rise from 3 percent to 5 percent of domestic consumption for almost all agricultural products.

[959] Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 5.

to 3% whenever their producers are threatened by import surges or sudden drops in price.[960] SSGs are however to be taken over those agricultural products that have undergone the tarrification process. This implies that governments cannot employ safeguard measures over agricultural products that have not undergone tarrification. Furthermore, under the AOA, Least Developed Countries (LDCs) are exempt from tariff reduction commitments even though they are still under the tarrification obligation.[961] The taking of special measures for sensitive areas is also allowed in the AOA. This means that aside from the SSG's which are to be employed in response to import surges and sudden drops in price, MS are authorized to employ, for instance, import restrictions with the aim of garnering protection to their sensitive agricultural commodities.[962]

With the intention of minimizing expected high tariffs that could potentially arise from and during the tariffication process, the AOA provides for current as well as minimum access provisions.[963] By so doing, the AOA tries to put down expected effects of the tariffication process on market access, by requiring MS to keep in place "current access opportunities" no less than the average of annual import quantities for the years 1986 to 1988.[964] Moreover, in the circumstance that MS do not have significant imports during the base year, they are however required to provide "minimum access" opportunities through the introduction of tariff rate quotas (TRQs).[965] In this regard, TRQs allow for a specified volume of imports which they consumed to enter their domestic markets from other MS at a reduced tariff rate.[966] In this regard, for instance, Japan was required to import 3% of the rice it consumed from foreign markets while the percentage had to reach 5% by 2005.[967] Additionally, countries such as the U.S. and Canada respectively were obliged to have imported particular amounts of maize and wheat from foreign markets even though both had specialized in the production of these very commodities.[968]

[960] Ibid.
[961] Agreement on Agriculture, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 15(2); McNiel, "Agricultural Trade Symposium", 62.
[962] World Trade Organization, Understanding the WTO-Agriculture: Fairer Markets for Farmers, http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm3_e.htm, Accessed on 12/04/2018. However, the employment of such special measures for sensitive areas is subject to the meeting of strictly defined conditions. For instance, Japan, the Republic of Korea, and the Philippines have used the special treatment provision so as to restrict the import of rice while Israel was allowed to employ special protection for its sheep meat, whole milk powder, and certain cheese products.
[963] Sturgess, The Liberalisation Process in International Agricultural Trade, 147.
[964] McNiel, Agricultural Trade Symposium, 61.
[965] Sturgess, The Liberalisation Process in International Agricultural Trade, 147.
[966] Christopher Stevens et al., The WTO Agreement on Agriculture and Food Security (2000):41; McNiel, Agricultural Trade Symposium, 61. In this regard, these quotas were initially set at 3 percent of the 1986-1988 base period domestic consumption, rising to 5 percent by the year 2000.
[967] Clapp, Food, 66 ff.
[968] Ibid.

4.2. Export Subsidies under the AOA

What are the rules guiding export subsidies in the Uruguay Round Agreement on Agriculture (URAOA)? When it comes to the second obligation of the AOA as regards reduction in export subsidies,[969] the Agreement imposes an obligation on developed countries of a 36% reduction commitment in expenditure on export subsidies and of a 21% reduction in the volume of their exports which is to be completed over a period of six years (1995-2000) based from the base period 1986-1990.[970] This said however, the AOA prohibits the introduction of new export subsidies not in operation during this base period. Developing countries have been put under lower obligations in line with their special and differential treatment[971] as they are required to introduce a 24% reduction in expenditure for export subsidies and a 14% cut in the volume of subsidized imports over a 10 year period (1994-2004). While this constitutes the obligation for developing countries, LDCs are under no reduction obligation commitments save for the obligation not to increase subsidized exports.[972]

The export subsidies provisions of the AOA also impose an obligation as regards its reduction requirements. Hence, unlike the market access provisions, the requirement to reduce export subsidies by a specific amount applies on a commodity by - commodity basis instead of an industry-wide average.[973] This said however, the AOA does not prohibit the aggregation of commodities done with the intention of complying with export subsidy reduction obligations.[974] This implies that a MS can utilize this option when such commodities are used as a derivative of a single group (wheat, wheat flour, and other wheat derivatives).[975] What this implies, as a result, is that a country that has subsidized, for instance, wheat and wheat products during the base period is granted the flexibility to shift subsidies between these products given the MS in question has complied with its export reduction commitments.[976]

Moreover, the AOA specifies the types of export subsidies which are subjects of reduction under Article 9(1). In this regard, six types of export subsidies have been identified as being

[969] According to the Agreement on Subsidies and Countervailing Measures (SCM), a subsidy is a financial contribution made by a government or any public body conferring a benefit on the recipient, Agreement on Subsidies and Countervailing Measures in Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, Marrakesh, 15 April 1994.
[970] McNiel, Agricultural Trade Symposium; Kevin J. Brosch, The Uruguay Round Agreement on Agriculture in the GATT, in THE GATT, The WTO and the Uruguay Round Agreements, (H. Applebaum & L. Schlitt eds., 1995): 868; McMahon, "The Uruguay Round and Agriculture: Charting a New Direction?", 429. See also, Article 3(1) of the AOA. The reduction commitments as regards export subsidies and domestic support are part of each Member's Schedule and constitute commitments limiting subsidization and are made an integral part of GATT 1994.
[971] Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 15(2); McMahon, "The Uruguay Round and Agriculture: Charting a New Direction?", 429.
[972] Ibid.
[973] Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 9; Sturgess, The Liberalisation Process in International Agricultural Trade, 147-148.
[974] Hathaway & Ingco, Agricultural Liberalization and the Uruguay Round, 19.
[975] Ibid.
[976] Ibid.

subjects of reduction.[977] Aside from this, the AOA prohibits the use of export subsidies which are not subjects of reduction, in a manner that would restrain the employment of reduction commitments.[978] Additionally, the AOA prohibits the introduction of export subsidies that were not introduced during the 1986-1990 base year.[979] This implies that those countries that did not introduce export subsidies during this period are prohibited from the introduction of new subsidies.

Furthermore, the AOA provides for an anti-circumvention provision under Article 10, with the aim of circumventing reduction on other export subsidy commitments. Hence, the Agreement provides a definition of food aid so as to avoid transactions which are claimed to be food aid while not meeting the criteria. Accordingly, the provision of food aid is allowed given that it is not directly or indirectly tied to commercial exports of agricultural products.[980] Additionally, whenever food aid is given, it should be given to the fullest extent possible, in the form of grant as well as in accordance with the 1986 Food Aid Convention and with the U.N. Food and Agriculture Organization's "Principles of Surplus Disposal and Consultative Obligations".[981]

[977] Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 9(1). These include, direct subsidies to producers, including in-kind payments, contingent on export performance; the sale or disposal for export by governments of agricultural products at a price lower than the comparable price charged for the like product on the domestic market, subsidies to reduce marketing costs (other than export promotion or advisory services), including handling and transportation costs.
[978] Ibid, Article 10(1).
[979] Ibid, Article 3(3).
[980] Ibid, Article 10(4).
[981] Ibid.

4.3. Place of Domestic Subsidies in the AOA

In the AOA, MS have an additional obligation as regards the provision of domestic support.[982] This obligation is to be assessed based on the extent to which such support measures are trade distorting.[983] As such, based on this consideration, the AOA has provided three categories of domestic support and namely: 1. Amber Box, 2. Blue Box and 3. Green Box support measures.[984]

Accordingly, those measures which are considered to be trade-distorting refer to "Amber Box" policies being the subject of reduction commitments.[985] In this regard, such trade-distorting support measures are to be measured by the Aggregate Measures of Support (AMS) which is expected to capture in nominal terms, trade-distorting subsidies. Hence, on the one hand, developed countries have a reduction commitment of 20% to be met in a period of six years calculated from the base year (1995-2000). On the other hand, developing countries in line with their commons and differentiated treatment have a reduction commitment requirement of 13.3% in Base total AMS in ten years (1995-2004).[986] However, government support measures in research and infrastructure are exempt from reduction requirements. Current total AMS (the level of support provided in any given year), includes those subsidies which are considered most trade-distorting (Amber Box policies).[987] The AOA excludes two forms of domestic support measures from the Current Total AMS, for developed countries, as per the "*de minimis*" exception, it excludes products where the amount of support provided is less than 5% of the total annual amount of production and 10% for developing countries.[988] The second element which is excluded from Current Total AMS includes direct payments made under production-limiting programs; also known as Blue Box exception.[989] In this regard, "Blue Box" measures are "Amber Box" support measures with conditions. This is because a support measure that would normally be placed in the Amber Box category will be placed in the Blue Box if such measures are linked to a programme designed to limit

[982] Domestic support measures are also known as "producer subsidies" that refer to payments and transfers of value given to producers. See, Hudec, "Does the Agreement on Agriculture Work?".
[983] FAO, The State of Food and Agriculture, Agricultural Trade and Poverty: Can Trade Work For the Poor?, 33 ff.
[984] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 10(4), Article 6 (1), 6 (5) and Annex 2.
[985] Ibid, Article 10(4) and Article 6(1). "Under the AoA, a ceiling is set in AMS terms at $21bn for the US and $19.8bn for the EU". Amber Box measures are considered to be highly trade distorting in the AOA because such measures are directly tied to production and price. The provision of such government support measures includes for example, the provision of price support and some government credit subsidies fall into this category.
[986] McMahon, "The Uruguay Round and Agriculture: Charting a New Direction?," 428. Base total AMS is a benchmark on which reductions are made.
[987] McNiel, "Agricultural Trade Symposium", 112; AOA: Article 6(5).
[988] Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 6(5).
[989] Ibid. Blue Box measures are direct payments given to farmers with the intension of restricting production. These measures can be categorized as Amber Box measures. However, to the extent that Blue Box measures limit rather than encourage agricultural production, they are considered to have less trade distorting effect.

production. Under the AOA, there is no limit that has been introduced as to the amount of support that can be provided under this category of support. [990]

Nevertheless, some support measures provided through governments which are thought to have less or no trade-distorting effects are known as "Green Box" measure. Under the AOA, such support measures are not subjects of reduction commitment.[991] This is due to the fact that such measures are decoupled from production and price.[992] In this regard, the AOA has provided some criteria for the qualification of those measures for which exemption can be claimed. Firstly, the support has to be provided via a publically funded government program not including transfers from consumers while the support to be provided should not have the effect of price support to producers.[993] In addition to this, the AOA also exempts some support measures used by developing countries to support rural development.[994]

While the section above concludes the discussion about the three tired obligations the Agreement has put on MS of the WTO, the section below will deal with the "Peace Clause" provision. The Peace Clause of the AOA[995] has been inserted in the agreement at the insistence of the U.S. and the EU with a view to limit the scope of WTO MS from taking action against the abovementioned measures. The Peace Clause bans the imposition of countervailing duties on domestic support measures and export subsidies. More specifically, the Peace Clause puts an obligation on MS to restrain themselves from the taking of domestic countervailing duty proceedings or initiating WTO dispute settlement proceedings on those issues they consider challengeable.[996] The provision specifically exempts trade barriers from being challenged during the implementation period of the agreement under the Agreement on Subsidies and Countervailing Measures (hereafter, SCM) so long as MS complied with their

[990] Kevin Watkins, WTO Negotiations of Agriculture: Problems and Ways Ahead, Strategic Dialogue on Agriculture, Trade Negotiations, Poverty and Sustainability, Oxfam International, (Oxford, United Kingdom, 2004): 12-13.

[991] Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 10(4). Annex 2, Green Box measures include research, including general research, research in connection with environmental programmes, and research programmes relating to particular products; pest and disease control, including general and product-specific pest and disease control measures, such as early-warning systems, quarantine and eradication; training services, including both general and specialist training facilities; extension and advisory services, including the provision of means to facilitate the transfer of information and the results of research to producers and consumers; inspection services, including general inspection services and the inspection of particular products for health, safety, grading or standardization purposes; marketing and promotion services, including market information, advice and promotion relating to particular products but excluding expenditure for unspecified purposes that could be used by sellers to reduce their selling price or confer a direct economic benefit to purchasers and infrastructural services, including: electricity reticulation, roads and other means of transport, market and port facilities, water supply facilities, dams and drainage schemes, and infrastructural works associated with environmental programmes.

[992] For more, see, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 10(4), Article 6(2) & Annex 2(6), 2(7), 2(8),2(12). Income support to farmers decoupled from production includes, income safety-net programs, crop insurance programs and payments under environmental programs.

[993] Ibid, Article 10(4).: Annex 2(1)(a & b).

[994] Ibid, Article 10(4), Article 6(2) & Annex 2(6), 2(7),2(8),2(12). Such support measures may include, income support to farmers decoupled from production, income safety-net programs, crop insurance programs and payments under environmental programs.

[995] Ibid, Article 13.

[996] Ibid. The provision requires MS to use due restraint from using dispute settlement proceedings for nine years of the agreement.

obligations under the AOA.[997] The clause barred the imposition of duty with the aim of countervailing Amber Box as well as Blue Box measures unless such measures caused injury or threat to injury as per Article VI of the GATT and the SCM Agreement.[998] As such, this implied that export subsidies were only eligible for countervailing action given that they result in injury or threat to injury based on their impact, price, and volume. This said however, the Peace Clause had expired as of January 1st, 2004[999] which means that those actions which were exempt from countervailing action are now subject to be challenged under provisions of the SCM Agreement.[1000]

The above discussion has tried to show the provisions that deal with three pillars of the AOA with the aim of bringing down trade-distorting policies in agriculture. The section below will try to assess the limits of the afore-discussed provisions to bring about an equitable agricultural market liberalization.

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[997] Ibid.
[998] Ibid, Article 13(b).
[999] Ibid, Article 13. In December, 2013, at the 9th ministerial in Bali, developed countries had agreed to a Peace Clause for existing Public Stockholding programmes provided by developing countries for food security purposes. This means that given countries have these programmes and they are going beyond their domestic support commitments under the WTO's Agreement on Agriculture rules, they should not be brought to the WTO's dispute settlement until 2017, when the WTO would look for a permanent solution to address food security concerns., Uttam Gupta, Peace Clause that Brings Prosperity, Published on 21/02/2017.Available at, https://www.dailypioneer.com/2017/columnists/peace-clause-that-brings-prosperity.html., Accessed on 15/03/2019.; see also South Center, Improving the Bali Peace Clause on Public Stock Piling. for Food Security, Analytical Note, SC/TDP/AN, (South Center, November 2014: Geneva).
[1000] Richard H. Steinberg & Timothy E. Josling, When the Peace Ends: The Vulnerability of EC and US Agricultural Subsidies to WTO Legal Challenge, 6 Journal of International Economic Law, (2003).

5. Anomalies within the AOA

It is evident that the adoption of the AOA as one of the agreements annexed to the WTO has introduced, for the first time, clear rules in relation to trade in agricultural. This said, however, the provisions in relation to its three obligations, market access, export subsidies, and domestic support, have not resulted in addressing the problem at root as the rules only institutionalized already existing inequalities between the MS with far-reaching implications for developing countries. The following section will disclose the underlying reasons behind.

The first reason has to do with the tariffication obligation of the AOA under which all non-tariff import barriers to trade (quantitative barriers) are to be converted into tariffs with the aim of increasing market access.[1001] However, the market access obligation of the AOA has not resulted in equitable benefits between developing countries and developed countries.[1002] The underlying reason for this has been the fact that by the time the Uruguay Round negotiations were taking place, most developing countries, mainly Net Food-Importing Developing Countries (hereinafter, NFIDCs) and LDC's, had undergone reduction in their import tariffs and import quotas as part of their obligation under the SAPs of the WB and the IMF.[1003] In this regard, the reform measures under the SAP's had resulted in, *inter alia*, the deregulation of the market so as to open it for the private sector, the introduction of cuts in public agricultural services such as input provision by the State, agricultural credit schemes, and extension services, while at the same time entailed, the abolishment or reduction of taxes on exports. In addition to this, government controls on agricultural trade policies were reduced whereas in relation to imports, the policy measures undertaken included the setting of a maximum ceiling for tariffs as well as a reduction/abolition of NTBs.[1004] For this reason, by the time the AOA came into force, these countries had lower rates of applied import tariffs than the tariff bindings they agreed to under the AOA. For this reason, in place of tarriffication, they declared bound tariffs in accordance with the terms of their individual country schedules, which were set at a higher level than the current applied tariffs.[1005] What this meant was that most of these NFIDC and LDCs had undertaken greater market access liberalization as part of SAPs.[1006]

[1001] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 4(1).

[1002] Schutter, "International Trade in Agriculture and the Right to Food", 145 ff.; Anderson, and Will, Agricultural Trade Reform and the Doha Development Agenda. In this regard, agricultural policies in developed countries cost developing countries about $17 billion per year; which is equivalent to about five times the current levels of overseas development assistance to agriculture

[1003] FAO, The State of Food and Agriculture, Agricultural Trade and Poverty: Can Trade Work For the Poor?, 40-41.

[1004] Background Note by the UNCTAD Secretariat, impact of the Reform Process in Agriculture on LDC's and Net Food-Importing Developing Countries and Ways to Address their Concerns in Multilateral Trade Negotiations, TD/B/COM.1/EM.11/2, (Geneva, Switzerland, 23 June 2000):6.

[1005] Hathaway & Ingco, Agricultural Liberalization and the Uruguay Round, 11.

[1006] FAO, The State of Food and Agriculture, Agricultural Trade And Poverty: Can Trade Work For The Poor?, 40-41; FAO, FAO Symposium On Agriculture, Trade and Food Security, 5.

On the contrary, the AOA has resulted in limited market access that was achieved and has even led to further market distortions by developed countries.[1007] This has been a result of the AOA tariff reduction commitments, which were to be achieved based on a simple average. The implication of this has been that developed countries have employed the obligation strategically.[1008]As such, they have reduced their tariffs on sensitive high tariff products by a low amount (10% for developing and 15% for developed countries between 1995-2000) while on those less sensitive products with lower rates of tariff, by a large amount so as to fulfill their obligations.[1009] Thus, the effect of this has been a low reduction on high tariff commodities and a high amount of tariff reduction on commodities that already had low tariffs.

Additionally, the manner in which the tariff reduction commitments were implemented by developed countries explains the reason why the AOA's market access obligation has not resulted in an increase in market access. This has been caused by the high levels of tariffs, which are still maintained by developed countries for agricultural products when compared to manufactured goods.[1010] In this regard, exporters in developing countries are confronted with an average tariff of 15.6% on the export of their agricultural commodities while the rate for textile and manufacturing exports are lower respectively at 9.3 and 2.5%.[1011]

Furthermore, developed country MS of the OECD have evaded the underlying justification behind the tariffication process by introducing high rates of non-tariff equivalents in place of their non-tariff barriers (alternatively known as dirty tariffication).[1012] This implies that the introduction of tariff equivalents on which subsequent reduction commitments would apply has resulted in more restrictive non-tariff equivalents than the non-trade barriers they have replaced.[1013] Moreover, given the fact that high tariffs were maintained on commodities such as sugar, tobacco, meat, milk products, cereals (as well as fruits and vegetables to a lower degree) which are export commodities of interest for developing countries, the effect of this

[1007] See, The World Bank, World Development Report: Agriculture for development, 104-105. More than 90 % of the global costs are estimated to come from market access restrictions through tariffs

[1008] FAO, The State of Food and Agriculture, Agricultural Trade and Poverty: Can Trade Work For the Poor?, 40-41; Background Note by the UNCTAD Secretariat, impact of the Reform Process in Agriculture on LDC's and Net Food-Importing Developing Countries and Ways to Address their Concerns in Multilateral Trade Negotiations, 6-7. According to an UNCTAD study, on average, Uruguay Round bound agricultural tariffs of developed countries are estimated at 27.1 per cent, compared with 3.5 per cent for industrial products and 3.7 per cent for all merchandised products.

[1009] FAO, The State of Food and Agriculture, Agricultural Trade and Poverty: Can Trade Work For the Poor?, 40-41.

[1010] For more, see, OECD, The Uruguay Round Agreement on Agriculture: An Evaluation of its Implementation in OECD Countries, (OECD, Paris: 2001). The tariff rates for some agricultural commodities in OECD countries exceed 500%.

[1011] Anderson & Will, Agricultural Trade Reform and The Doha Development Agenda, 6ff; UNDP, Human Development Report, International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World, 2005, (UNDP, New York, 2005): 127ff. For example, imports from developing countries account for less than one-third of developed country imports while representing two-thirds of the tariff revenues collected. They also account for two-thirds of developed country imports subjected to tariffs higher than 15%.

[1012] Hathaway & Ingco, "Agricultural Liberalization and the Uruguay Round", 11-15; Sturgess, The Liberalisation Process in International Agricultural Trade, 148-49.

[1013] Ibid.

has been higher on them.[1014] Additionally, OECD countries have implemented the obligation as regards reductions in tariffs via the introduction of high reductions on those commodities which are not produced domestically and where tariffs were already low, by the introduction of concessions to imports which competed with domestically produced goods.[1015] Hence, high tariffs (referring to tariff peaks on processed goods which results from advances in the processing chain)[1016] are maintained on tropical products consisting mostly of staple foods, fruits, and vegetables as well as on processed goods.[1017] Tariff escalation[1018] has resulted in limitation in market access to commodities coming from developing countries. This is because such escalation has pushed these countries to concentrate on the production of primary commodities while processing and refinement takes place in developed countries. Therefore, developing countries have been excluded from having access to the processing market of developed countries hence restraining their reach into the production of high value-added market.[1019]

Therefore, the AOA has not resulted in increased market access to developing countries as it only promotes a limited increase to access opportunity rather than a requirement to allow more imports.[1020] Furthermore, developed countries have used the SSGs to their advantage by introducing higher trigger price above the 1986-1988 world price. In this regard, developing countries are unable to make use of SSGs, due to the fact that they had not undergone the tariffication process under the AOA, while on the contrary, 80% of tarrified items in developed countries can employ the SSGs.[1021] On the contrary, developing countries have adopted uniform levels of reduction for all agricultural products.[1022] This precludes developing countries from the utilization of tariffs to protect sensitive agricultural products or domestic producers from unfair competition. In this scenario where developing countries have not been able to invoke the SSG, they have been victims of import surges (in meat and dairy) with food commodities being sold at below market price which served as a disincentive domestic food production.

[1014] U.N Conference on Trade and Development, UNCTAD/WTO JOINT STUDY: The Post-Uruguay Round Tariff Environment for Developing Country Exports: Tariff Peaks and Tariff Escalation, TD/B/COM.1/14/Rev.(2000): 1-6.

[1015] Sturgess, The Liberalisation Process in International Agricultural Trade.

[1016] OECD, THE Uruguay Round Agreement on Agriculture and Processed Agricultural Products.

[1017] For more, see, United Nations Conference on Trade and Development., THE POST-Uruguay Round Tariff Environment for Developing Country Exports, TD/B/COM, (1997); UNDP, Human Development Report, International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World, 127. In this regard, according to a study by the UNDP, developing countries account for less than one-third of developed country imports but for two-thirds of tariff revenues collected. They also account for two-thirds of developed country imports subjected to tariffs higher than 15%.

[1018] Tariff escalation takes place when the level of import tariffs increases corresponding with the degree of processing on commodities. See, FAO, Food and Agriculture Organization, The State of Food and Agriculture: Agricultural Trade and Poverty Can Trade Work For the Poor?, 41-42.

[1019] FAO, Symposium on Agriculture, Trade and Food Security, 127; UNDP, Human Development Report, International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World, 127-131. For instance, tariff escalation has forced cocoa producing countries like Côte d'Ivoire and Ghana from the export of processed cocoa beans while Germany has become the largest producer of processed cocoa.

[1020] Sturgess, The Liberalisation Process in International Agricultural Trade, 149.

[1021] FAO, Symposium on Agriculture, Trade and Food Security, 127.

[1022] Ibid. Most developing countries have introduced high levels of tariff ceilings than the tariffication option by setting a single bound tariff rate for all agricultural commodities.

As can be seen from this discussion, the market access obligation of the AOA has not resulted in increased developing country imports into developed countries for the reasons already implied (dirty tariffication, selective tariff reduction, limits in the agreement's minimum access requirement).[1023]

In a similar vein, the AOA's export subsidy obligation is said to have intensified the gap between developing and developed countries.[1024] The reason for this is the fact that under the AOA both developed and developing countries have an obligation (at a lower rate for the latter) to reduce the provision of export subsidies while the agreement prohibits the introduction of new subsidies.[1025] Nevertheless, the obligation is more beneficial for developed countries that have in the past introduced export subsidies to support their agricultural sector. For this reason, OECD countries had maintained lower rates of export subsidies than the reduction required under the AOA. In light of this, the fact that the implementation period of the Agreement[1026] coincided with a rise in the market price for cereals meant that they were able to meet their commitments quiet easily.[1027] This said, however, the export subsidy reduction commitment has not been effectively met by OECD countries. The reason for this has been that the level of support provided only fell from 37% of the gross value of farm receipts in 1986–88 to 30% between 2003-2005.[1028] This said, however, the amount of support increased during this time from 242% to 273% billion dollars.[1029] Moreover, the AOA has allowed developed countries to strategically avoid reduction commitment of their subsidies by shifting resources to those forms of support that are not prohibited in the AOA; green box measures that are exempt from reduction commitments.[1030] In addition to this, the AOA has allowed the utilization by developed countries of those domestic support measures by exempting the domestic support measures that are mostly used by developed country MS (U.S and EU).[1031]

[1023] For more, see the discussion under section 4 of this research.
[1024] See, Gonzalez, "Institutionalizing Inequality", 464-465.
[1025] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, April 15, 1994: Article 9.
[1026] Ibid, Article 1(f).
[1027] See, OECD, The Uruguay Round Agreement on Agriculture: An Evaluation of its Implementation in OECD.
[1028] The World Bank, World Development Report: Agriculture for Development, 97.
[1029] Ibid. This measurement is done by what is called producer support estimate (PSE), which measures the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level as a share of the gross value of farm receipts. When it comes to the provision of export subsidies in the OECD, the level has actually increased from where it was in the 1986-88. This means that during 1998–2000, subsidies climbed to US$330.6 billion.
[1030] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, April 15, 1994: Annex 2; Gonzalez, "Institutionalizing Inequality", 464-465; OECD, The Uruguay Round Agreement on Agriculture: An Evaluation of its Implementation in OECD Countries; Martin Khor, "Analysis of the Doha Negotiations and the Functioning of the WTO, Geneva, The South Centre" (May 2010), M. G. Desta, 'Food Security and International Trade Law: An Appraisal of the World Food Organization Approach', Journal of World Trade 35(3), (2001): 449. One instrument that has been utilized in this regard has been the provision of food aid which is being used by aid providing developed countries as a means to evade their export subsidy reduction obligation under the AOA. This is due to the fact that food aid is growingly being viewed as a form of export subsidy having the aim of enhancing the commercial interest of the aid providing countries.
[1031] See, Gonzalez, "Institutionalizing Inequality", 465-483.

More specifically, when the effect of the AOA is assessed with regard to the export of NFIDC and LDC's to developed countries, it is easy to observe the gap which has been created. This is especially the case because the main recipient of these exports is the EU under its preferential market access schemes. In a study conducted by United Nations Conference on Trade and Development (hereafter, UNCTAD), from the total agricultural exports of LDC's, an average of 63 % of total agricultural exports in the period 1995-1997 went to the EU.[1032] Of this agricultural export, on average 65% of those LDC exports in 1996 have entered the EU as part of the preferential access rates of the Lomé Convention and the EU's Generalized Scheme of Preference (GSP) rates for LDCs.[1033] In this regard, even though such preferential market access schemes have been put in place with good intentions in mind; the opening up of the export market for commodities of developing countries, some challenges have been observed. This is related to that fact that as per the MFN principle of the WTO, developed country MS are required to extend similar treatment for every country including those countries that are not recipients of preferential market access.[1034] This would entail that the MFN principle will diminish the relative price advantage that these countries would have received as part of their special treatment.[1035] Another reason concerns the rules of origin requirement put in place, which specifies how much value of inputs must be added in the production of exports that are entitled to such preferences. [1036] This has added further limits on exports from the preference receiving countries.[1037]

As such, the fact that developing countries are barred from the introduction of new export subsidies means that developing countries will not be able to get revenue from their exports.[1038] As a consequence, there will be a dependence of developing countries on the provision of subsidized food imports. However, the obligation under the AOA of reduction in export subsidies would especially affect those developing States that have become dependent on food imports. In this regard, a World Bank study has indicated that of the $2.55 billion gain which has resulted from the elimination of export subsidies in developed countries, about $1.5 billion has been a transfer from developing countries and transition economies.[1039]

[1032] Background Note by the UNCTAD Secretariat, impact of the Reform Process in Agriculture on LDC's and Net Food-Importing Developing Countries and Ways to Address their Concerns in Multilateral Trade Negotiations, 7.
[1033] Ibid. The "EU's GSP removes import duties from products coming into the EU market from vulnerable developing countries. This helps developing countries to alleviate poverty and create jobs based on international values and principles, including labour and human rights"., Accessed from, http://ec.europa.eu/trade/policy/countries-and-regions/development/generalised-scheme-of-preferences/, Accessed on 27/02/2019.
[1034] See, General Agreement on Tariffs and Trade, (October 30, 1947): Article 1.
[1035] Ibid. This said however, it cannot be concluded that the MFN obligation has resulted in limited market access opportunities for preference receiving LDC's and NFIDCs in absolute terms.
[1036] See, UNDP, Human Development Report, International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World, 127-128.
[1037] Ibid.
[1038] See, Stewart, The GATT Uruguay Round: A Negotiating History (1986-1992).
[1039] Thomas W. Hertel and Roman Keeney, "What Is at Stake: The Relative Importance of Import Barriers, Export Subsidies and Domestic Support" in Agricultural Trade Reform and the Doha Development Agenda, (Kym Anderson & Will Martineds eds.) (Palgrave Macmillan and the World Bank, 2006): 49-50.

In the area of domestic support obligation[1040] as well, it is easy to observe the disparity. As already implied in the foregoing section, developed countries are under an obligation to reduce the most trade-distorting form of domestic support provision, Amber Box measures, during the base period, 1986-1988. Developing countries are under no reduction obligation as they have not introduced significant domestic measures during the base year.[1041] Furthermore, developing countries are prohibited from the introduction of Amber Box support measures that go beyond the "*de minimis* level".[1042] Hence, the Agreement institutionalizes the double standard by prohibiting developing countries that have not in previous times made use of subsidies to be within the "*de minimis*" level.[1043] The utilization of Amber Box subsidies measures that exceed the "*de minimis*" level is only allowed under the rural development exemption; i.e., Special and Differential Treatment (SDT) of the AOA.[1044] Additionally, the AOA's exemption of some domestic support measures, namely Blue Box and Green Box measures which are for the most part utilized by developed countries, has worsened the position of developing countries. This is because such measures are exempt from reduction commitments as they are thought to have low or minimal trade distortion effects.[1045] In turn, this has enabled developed countries to make strategic use of such measures so as to evade their reduction obligations at the expense of developing countries.[1046] The consequence of the employment of such measures in developed countries has led to overproduction in the agricultural sector which has depressed market price. This has, in turn, disincentivized domestic production in developing countries, with clear implications on producers in developing countries.

As the above discussion has tried to show, the AOA's market liberalization agenda via an increase in market access, reduction in export subsidies and trade-distorting domestic support measures has led to unequal benefits between developing and developed countries.

[1040] For more, see, OECD, The Uruguay Round Agreement on Agriculture: An Evaluation of its Implementation in OECD Countries. The EU, US. and Japan together account to 90% of total domestic subsidy provision (inter alia, AMS, blue box, green box, de minimis, and special and differential treatment) for the OECD area as a whole.

[1041] FAO, Symposium On Agriculture, Trade and Food Security, 127.

[1042] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 6(4). De Minimis refer to those subsidies that do not exceed 10 percent of the total value of agricultural production and 10 percent of the support provided to a particular agricultural product

[1043] Ibid, Article 6(4)(b).

[1044] Ibid, Article 6(2). The exemption permits investment subsidies generally available to agriculture in developing countries, input subsidies generally available to low-income or resource-poor producers, and domestic support to encourage diversification from growing illicit narcotic crops.

[1045] This study by OECD has found out that Green Box and Blue box measures though to have no trade distorting effect and low trade distorting effect respectively may have distorting effect. For more, see, OECD, the Uruguay Round Agreement on Agriculture: An Evaluation of its Implementation in OECD Countries.

[1046] See, FAO, Symposium on Agriculture, Trade and Food Security, 127; OECD, the Uruguay Round Agreement on Agriculture: An Evaluation of its implementation in OECD Countries. The study found out that 60% of OECD agricultural subsidies are excluded from reduction commitments. Green box" exemption has allowed developed countries to evade subsidy reduction obligations by transforming prohibited subsidies into direct payments to farmers decoupled from production. The "blue box" exemptions have permitted the U.S. and the E.U. to promote exports by paying farmers the difference between a government target price for agricultural commodities and the corresponding market price while the "green box" exemption has allowed developed countries to evade subsidy reduction obligations by transforming prohibited subsidies into direct payments to farmers decoupled from production

6. Asymmetrical Trade in Agriculture: The Implication of an Unequal Playing Field

Since it entered into force, the Uruguay Round Agreement on Agriculture (URAA) has remained a subject of mounting criticism. Even though the underlying reasons behind these views in relation to the right to food are disclosed in forthcoming sections, the section below explores some of these criticisms.

In this regard, one of the main concerns raised relates to the fact that the interest of developing countries has not been reflected in the Agreement. This concern is raised due to the fact that when the AOA was being negotiated, the main players during the negotiation process were developed countries, mainly the EU and U.S.[1047] In fact, the existence of numerous exceptions to the rule as noted above, clearly reveal that the Agreement brought together two proposals: the U.S. and EU's. As per the bilateral agreement - the Dunkel Draft - that was reached in 1992 in which these countries agreed to bypass the stalemate that was present in the GATT[1048] culminating to the adoption of the AOA. Due to this fact, developing countries did not involve themselves in the negotiation process. However, in the circumstance that they saw the rules falling short to reflect their interests, they only relied on SDT provisions of the AOA.[1049] Hence, from the point of view of developing countries, the main area of concern arises from the possibility that the URAA architecture could provide a framework for the adoption of agreements in the future which are much more constraining for their interests.[1050]

In addition to this, even though as part of the tariffication obligation of the AOA developing countries are expected to have access to food imports coming from developed countries, as noted above, this has not materialized therefore resulting in some challenges. This is because heavy State subsidies in OECD countries has led to excess production of agricultural commodities which needed to be dispossessed into the world market at below the cost of production.[1051] In turn, it has promoted the dependence of developing countries on cheap imports from developed countries hence having an effect on their economic stability.[1052] This has especially affected, for instance, sub-Saharan countries for whom the export of agricultural commodities constitutes the main export earnings while the sector is responsible for the employment of more than 80% of the population in developing countries.[1053] This has resulted in market disruptions, which depressed domestic prices for importing developing countries hence leading to low incentives for local production.[1054]

[1047] Stevens et al, "The WTO Agreement on Agriculture and Food Security", 40-41.
[1048] Clapp, Food, 63ff.
[1049] Ibid.
[1050] Ibid.
[1051] See, Mark Ritchie & Kristin Dawkins, WTO Food and Agricultural Rules: Sustainable Agriculture and the Human Right to Food, Minn. J. Global Trade 9, (2000); Schutter, "International Trade in Agriculture and the Right to Food".
[1052] Martha B. Hailu, Consequences of Agricultural Trade Liberalization: A Food Insecure Country's Perspective, (2011): 14.
[1053] See, Ritchie & Dawkins, WTO Food and Agricultural Rules: Sustainable Agriculture and the Human Right to Food; Schutter, "International Trade in Agriculture and the Right to Food".
[1054] Ibid.

Irrespective of the different schemes LDC's are intended beneficiaries of, for instance, (such as the EU's Everything But Arms)[1055] initiative under which LDCs are granted quota and duty- free market access, high tariffs are still maintained on tropical products of developing countries.[1056] As noted above, these countries additionally suffer from tariff escalation.[1057] This has resulted in a lack of diversification in their agricultural exports and has put a hurdle on exports into high value-added products.[1058] The proliferation of this phenomenon has been that the import of raw agricultural commodities has been favored in the high value-added market of developed countries while processing takes place elsewhere. The result has been that developing countries have been restrained in their ambitions to diversify their agricultural sector into the high value-added market in developed countries.[1059] As a result, developing countries have not benefited from the multilateral tradition system in relation to tariffs.

Likewise, the AOA's obligation on MS to reduce domestic support provision has not been equitably beneficial for developing and developed countries. This has been because the AOA puts an obligation on developing country members to reduce their domestic support provision calculated on the total Aggregate Measures of Support (AMS) based on the base year 1986-1988[1060] depending on a calculation of how much the domestic support measures have been trade distorting; Green Box, Amber Box and Blue Box measures.[1061]

As already implied, MS can maintain support provision to product-specific support up to a "*de minimis*" level based on the total value of production of the goods concerned by 5% for developed countries and 10% for developing countries and non-specific support for the same percentage, for instance to provide seeds or fertilizers to producers.[1062] However, many developing countries are unable to provide this level of domestic support. Furthermore, besides this, the AOA obliges MS to reduce the level of support they provide to their agricultural sector by 20% for developed countries and 13.3% for developing countries from

[1055] EU's Everything but Arms initiative refers to a special arrangement benefiting 49 LDCs, under which these countries are guaranteed duty-free and quota-free access to the EU market for all products except those listed under Chapter 93 of the Common Customs Tariff, which concerns arms and ammunition. The 'Everything-but-arms' initiative is part of the EU's Generalized System of Preferences initiated in 1971, and currently defined under a 2008 Regulation for 2009–11 (see, Council Regulation (EC) No 732/2008 of 22 July 2008, applying a scheme of generalized tariff preferences for the period from 1 January 2009 to 31 December 2011 and amending Regulations (EC) No 552/97, (EC) No 1933/2006 and Commission Regulations (EC) No 1100/2006 and (EC) No 964/2007, [2008] OJ L211, 1).

[1056] Schutter, "International Trade in Agriculture and the Right to Food" 145-146. De Schutter argues that even after the elimination of all trade distorting domestic policies, because of low labor productivity, they will not see much improvement in their trading positions. In 2006, for instance, Labor productivity for LDCs, LDCs was just 46 percent of the level for other developing countries and in other developing countries and below 1 percent of the level in developed countries.

[1057] Tariff escalation refers to the employment of tariffs with the aim of protecting the processing industries of importing countries.

[1058] Food and Agriculture Organization, The State of Food and Agriculture: Agricultural Trade and Poverty Can Trade Work for The Poor?, 41-42. Tariff escalation takes place when the level of import tariffs increases corresponding with the degree of processing on commodities.

[1059] For more, see, A.F. McCalla & J. Nash, Reforming Agricultural Trade for Developing Countries. Key Issues for a Pro-Development Outcome of the Doha Round, vol. I, (World Bank, Washington D.C. :2007).

[1060] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Annex 3 & 4.

[1061] Ibid, Article 6.

[1062] Ibid, Article 6(4)(a &b).

the base year 1986-1988 while LDCs are exempt from any obligation.[1063] Hence, this implies that the scheme is more beneficial for developed countries that had already introduced domestic support during the base year while leaving out developing countries that had introduced none, therefore maintaining the imbalance which already exists as regards levels of domestic support provision.[1064] Moreover, due to the fact that most developed countries had already introduced reductions to their export subsidies compared to the base period (1986-1988), after the coming into force of the AOA in 1995, they had to reduce their AMS by a few percentages so as to fulfill their obligations.[1065]

As implied above, Blue Box[1066] domestic support measures under AOA are considered to be less trade-distorting, as they are expected not to lead to overproduction leading to a surplus in the international market. These support measures refer to direct payments made against production-limiting programmes.[1067] Because of this, as already highlighted, such measures are exempt from reduction commitments. However, developing countries are unlikely to make use of such measures as they cannot afford them. Moreover, as there is no restriction as to the export of such commodities protected this way, developed countries are in a position to reap gains at the expense of developing countries.[1068] The exemption of Blue Box measures has hence allowed developed countries to maintain their domestic support provision. For instance, it has allowed countries such as the U.S. (deficiency payments) and the E.U. (compensation payments) to continue the provision of domestic support measures.[1069]

In a similar vein, the third obligation in relation to the reduction of export subsidies has resulted in distortions on developing countries. In this regard, the AOA does not prohibit export subsidies save for the obligation it has put on MS to reduce such measures during the implementation period of the agreement.[1070] Therefore, as already indicated, the AOA imposes an obligation on developed countries to reduce their export subsidies by 36% in value terms while in terms of the volume of goods benefiting from such subsidies, they have to introduce reduction of 21% over a period of 6 years, as compared to the base period (the AOA prohibits introduction of new subsidies).[1071] Nevertheless, this leaves developing

[1063] See, McMahon, The Uruguay Round and Agriculture: Charting a New Direction?, 428. Base total AMS is a benchmark on which reductions are made.
[1064] Schutter, International Trade in Agriculture and the Right to Food in Accounting for Hunger, 146-147.
[1065] Dimitris Moutsatsos, The Uruguay Round Agreement on Agriculture: Issues and Perspectives, in Negotiating the Future of Agricultural Policies: Agricultural Trade and The Millennium WTO Round 29, 31 (Sanoussi Bilal & Pavlos Pezaros eds., 2000): 138-139.
[1066] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 6(5).
[1067] Such support measures are considered especially beneficial to EU's Common Agricultural Policy.
[1068] Olivier De Schutter, International Trade in Agriculture and the Right to Food in Accounting for Hunger, 146-147.
[1069] Both schemes pay farmers the difference between the actual market price for a given commodity and a higher target price established by the government. See McNiel, Agricultural Trade Symposium: Furthering the Reforms of Agricultural Policies in the Millennium Round, 57.
[1070] "Implementation period" is used to refer to the six-year period commencing in the year 1995, except that, for the purposes of Article 13, it means the nine-year period commencing in 1995". See, AOA: Article 1(f). In this regard, AOA's sole requirement of reduction in export subsidies for instance contrasts with the Uruguay Round Agreement on Subsidies and Countervailing Measures under which export subsidies are prohibited.
[1071] See, McNiel, Agricultural Trade Symposium: Furthering the Reforms of Agricultural Policies in the Millenium Round; Brosch, The Uruguay Round Agreement on Agriculture in the GATT, in the GATT, The

counties that have not introduced such measures of support in a disadvantageous position while benefiting developed countries, that had made use of export subsidies before the coming into force of the AOA.[1072] This is because developed countries had historically subsidized their agricultural sector while developing countries have done so through the introduction of agricultural tax.[1073] As such, the AOA by allowing developed countries to maintain their export subsidies (no prohibition obligation) only subject to reduction commitments and a prohibition on the introduction of new subsidies, has institutionalized the competitive advantage of developed countries.[1074]

It is worth noting that such a form of protection (export subsidies) provided by developed countries has a serious impact on the food security of developing countries.[1075] This is because export subsidies lead to the arrival of cheap subsidized goods on the market of developing countries.[1076] In the short-run, this means that consumers (nonagricultural producers) will benefit from cheap food commodities as they do not have to compete with the arrival of subsidized goods. However, in the long-run, it will lead to over-dependence of developing countries on cheap food imports which will decrease local production in NFIDC which makes them much more vulnerable to unsustainable changes in the price of commodities in the international market.[1077] Besides the above-discussed reasons, the base periods for the reduction of domestic as well as export subsidies, 1986-1988 and 1986-1990, have to be taken into consideration. This is due to the fact that these base periods experienced historically high levels of subsidies.[1078] The consequence is, that the reduction commitments under the AOA would decrease subsidies minimally and actually to levels that are much higher than where they were at in the 1960s and 1970s.[1079]

As the above discussion has tried to show, the provisions of the AOA in relation to the three areas of concern, (i.e. market access, export subsidy, and domestic support) have institutionalized existing unequal positions of the State parties favoring mainly developed country MS that had made use of such measures in previous times. The discussion below examines the restrictions this has put on the right to food.

WTO and The Uruguay Round Agreements, 868; McMahon, The Uruguay Round and Agriculture: Charting a New Direction?, 429.

[1072] Schutter, International Trade in Agriculture and the Right to Food in Accounting for Hunger, 145-146.

[1073] See, Stewart, The GATT Uruguay Round: A Negotiating History (1986-1992): 131.

[1074] FAO, Symposium on Agriculture, Trade and Food Security, 21. Only 25 out of 135 countries have the right under the Agreement to subsidize exports, and three exporting countries account for 93 percent of wheat subsidies, 80 percent of beef subsidies, and 94 percent of subsidies. see Stevens et al., The WTO Agreement On Agriculture and Food Security, 47.

[1075] See, A Panagariya, 'Agricultural Liberalization and the Least Developed Countries: Six Fallacies' World Economy: Global Trade Policy (2005):1277; Joseph Stiglitz and A Charlton, Fair Trade for All. How Trade can promote Development (Oxford, Oxford University Press, 2005):233.

[1076] Schutter, International Trade in Agriculture and the Right to Food in Accounting for Hunger.

[1077] Ibid, 145-146.

[1078] Clapp, Food, 70.

[1079] Ibid. 70.

7. Engulfed by Liberalization? How Has International Trade Restrained the Realization of the Right to Food?

As can be grasped from the foregoing discussion, it can be attested that the Uruguay Round trade negotiations, which among other areas, culminated in the adoption of the AOA in 1994 have resulted in limiting the ability of developing countries to equitably benefit from international trade. This assertion is especially to be seen clearly with regard to the right to adequate food. What have been the underlying reasons behind? The section below will investigate this. The analysis starts off with a discussion into how international trade has restrained the realization of the right to food, by focusing firstly on the consequences of dependency on food imports, and secondly on the restrictions that have emanated from deteriorating terms of trade. The third part will analyze the limited space the AOA has given developing countries to adopt those policies that will enhance food security.

7.1. Food Import Dependency

International trade in the agricultural sector has been blamed for exacerbating the food insecurity of farmers in the developing world. This observation has especially been seen clearly following the incorporation of agriculture, as stated above, in the multilateral trade regime with the adoption of the AOA. As already discussed, GATT rules did not formally apply to agriculture. Agriculture was only dealt with in so far as the Agreement gave MS the right to introduce quantitative import restrictions as well as export subsidies to protect their agricultural sector, as exceptions to its rules. However, the inclusion of rules on agriculture under of the AOA, with clear rules set as regards agricultural trade, has resulted in putting restrictions for the realization of the right to food and correspondingly food security of developing countries. Taking this into consideration, how has AOA's market liberalization agenda restrained the right to food?

7.1.1. Structural Adjustment Programs

The first factor behind dependency on imports goes back to the 1980's SAPs of the IMF and WB.[1080] The emergency package provided by the mentioned International Financial Institutions (hereafter, IFIs) was a response to the high levels of external debt developing countries had accumulated mainly following the 1973-1976 oil and food hikes in price.[1081] As a mechanism of addressing the crisis, these countries borrowed funds from international lenders mainly commercial banks in the U.S. However, the late 1970s witnessed a sharp rise in U.S. interest rates. This development only added to the debt accumulation of many of these countries as repayment of loans suddenly became more expensive.[1082] Hence, following the

[1080] See, Bello, and Victory, The United States and Global Poverty 85 (1999); Sarah Anderson, "Views From the South: The Effects of Globalization and The WTO on Third World Countries" (Food First Books: 2000): 26-28.
[1081] See for example, Clapp, "Food", 57-63.
[1082] Ibid.

default of Mexico to service its debt the country owed to commercial banks, the WB and IMF came to the rescue to help out those countries that had faced debt accumulation. In this regard, the policies of these IFIs made the disbursement of loans to be conditional on changes in national economic policy. This meant that the countries that wanted to receive loans, had to adopt SAPs in their economic policies (often referred to as the Washington Consensus).[1083] The policy changes that had to be made in the loan receiving countries included, *inter alia*, the devaluation of currency, the adoption of flexible exchange rates,[1084] trade liberalization via the removal of taxes on exports and tariffs on imports and barriers to foreign investment.[1085] The policies also promoted less State spending and the privatization of State-owned trade enterprises.[1086]

As such, as part of the conditionalities which had to be put in place for the disbursement of loan, developing countries had to, open up their markets and lower domestic State support provision.[1087] Hence, this meant that as a result of their obligation under SAPs, these countries had been pressured to open up their markets at rates below their bound level under the GATT, while at the same time they were required to reduce the level of domestic support in different areas including in agriculture.

More specifically, the economic policies under SAPs had the aim of changing the agricultural policies then in operation in developing countries (sub-Saharan Africa and Latin America).[1088] This was because these countries had introduced protectionist policies in the sector through the provision of subsidies for inputs such as fertilizers, seeds, and fuel, tariffs on imports with the intention of cutting back on the import of agricultural commodities they produced themselves.[1089] Additionally, with the aim of raising revenue from their exports[1090], as noted, these countries had imposed taxes on their exports. From the point of view of these IFIs; WB, IMF, these agricultural policies were negatively affecting the sector which they considered was the backbone of the economy. Hence, there IFIs promoted the liberalization of the sector so as to bring about recovery in the economy.[1091]

[1083] Ibid.
[1084] Ibid. Exchange rates were kept at a high value in developing countries so as to make exports more competitive on world markets.
[1085] See, Susan George, A Fate Worse Than Debt: The World Financial Crisis and The Poor (1990):52; Walden Bello Et Al., The Future in the Balance: Essays On Globalization and Resistance (Anuradha Mittal Ed., 2001):10-11; Michale Chossudovsky, The Globalization of Poverty: Impacts of IMF and World Bank Reforms (1997):62-63.
[1086] See, George, A Fate Worse Than Debt: The World Financial Crisis and The Poor, 52; Bello et al., The Future in the Balance: Essays On Globalization and Resistance, 10-11, Chossudovsky, The Globalization of Poverty: Impacts of IMF and World Bank Reforms, 62-63.
[1087] For more, see, Madeley, Hungry for Trade: How The Poor Pay for Free Trade (2000):44; George, A Fate Worse Than Debt: The World Financial Crisis and The Poor, 52.
[1088] Clapp, "Food", 57-63.
[1089] Ibid.
[1090] Ibid. Exports included for example cocoa, coffee and palm oil.
[1091] Ibid.

What has been the consequence of SAPs on the right to food? The effect of SAPs on the agricultural sector of developing countries with regard to the right to food has been vivid.[1092] Even though numerous research conducted in the area has scrutinized the reasons behind, this section will highlight, in brief, the main issues that were raised hence paving the way for the subsequent analysis. Firstly, the obligation of currency devaluation which was meant to boost exports, suddenly made imports more expensive. This was because some of these developing countries had devalued their exchange rates much more than they had to, so as to make their exports much more appealing.[1093] Secondly, even though imports had become expensive (unaffordable), due to the policy under SAPs, which required the opening up of the economies, agricultural imports found an easy way into the economies of these countries.[1094] In light of this, the policies resulted in import surges as they were backed by the provision of subsidies in developed countries mainly the U.S., EU, and Japan.[1095] Hence, even though imports got more expensive as a result of currency devaluation, they still made their way into developing countries owing to the provision of subsidies on imports by developed countries. In this regard, food imports became much cheaper and easier to move to urban markets because they are considered to be fluid and reliable when compared to, for example, having to transport such commodities locally from rural areas to cities.[1096]

Consequently, due to import surges in these countries, the effect has been felt by local farmers that had faced a drop in the market price for their exports.[1097] This had imposed a negative effect on farmers' food security as the policies restrained local production which was exposed to severe competition. As such, because farmers were unable to compete with subsidized developed country imports, this had resulted in low incentive to engage in domestic agricultural production.[1098] This fact further affected their food security as it snatched a vital means for revenue generation exacerbating their dependency on imports. The export-oriented policy framework under SAPs, likewise, has been affected. This is because, although export revenue was sought-after so as to ensure debt repayment, fierce competition between loan receiving countries had resulted in a drop in the price of exports.[1099] It can hence be attested that farmers in these countries were hit on two fronts as a result: firstly, they suffered from the

[1092] For more, see, Richard Peet et al., Unholy trinity: the IMF, world Bank and WTO (2003):77-125; Bello et al., The Future in the Balance: Essays on Globalization and Resistance, 10-12; Chossudovsky, The Globalization of Poverty: Impacts of IMF and world Bank Reforms, 45-69; Michael e. Conroy et al., A Cautionary Tale: Failed U.S. Development policy in Central America (1996):12-15; George, A Fate Worse than Debt: The World Financial Crisis and the Poor, 142-144.
[1093] See, for example, Clapp, "Food", 57-63.
[1094] Ibid.
[1095] Ibid.
[1096] Ibid.
[1097] See, Susan Stonich, "I Am Destroying the Land!": The Political Ecology of Poverty and Environmental Destruction in Honduras (1992).
[1098] Ibid.
[1099] See, George, A Fate Worse Than Debt: The World Financial Crisis and The Poor, 59-78; John Madeley, Forum Syd, Trade and Hunger: An Overview of Case Studies on the Impact of Trade Liberalization on Food Security (2002); Madeley, Food for All: The Need for a New Agriculture (2002).

global drop in the price for their exports.[1100] Secondly, they were hit again by the removal of state subsidies, subsidized credit and extensions service.[1101]

As such, the SAPs had mainly affected the agricultural sector in developing countries by snatching important tools for revenue generation such as tariffs on imports, taxes on exports and domestic subsidies provision.[1102] Furthermore, the removal of state subsidies and price controls had made the cost of basic necessities much more expensive becoming unaffordable for many.[1103] Therefore, the result has seen a stagnation in overall agricultural production in these countries, import surges, as well as a decline in agricultural investment all having an impact on the food security of agricultural producers.[1104]

As a consequence, the policies under the Washington Consensus on the agricultural programs of developing countries had significantly affected producers in these countries. This had put restrictions on farmers' livelihoods as it threatened their ability to engage in production for themselves, as well as make ends meet by engaging in commercial activities. A such, the policies violated the right to food of agricultural producers by restraining the "availability" of food to agricultural producers to feed themselves directly from land[1105] as they were unable to compete with subsidized food imports that made their way into the market. Moreover, the fact that under SAPs, these countries had been asked to do away with export subsidies, had negatively affected the competitiveness of their exports against highly subsidized developed country exports. Hence, this had violated the availability of adequate food as it restrained the possibility for "...a well functioning distribution, processing and market systems that can move food from the site of production to where it is needed in accordance with demand".[1106] As a result of this, in the 1980s, sub-Saharan African countries, mainly the least developed among them, such as Zambia and Ghana, had become net-food importers.[1107]

[1100] Clapp, "Food", 57-63; Madeley, Forum Syd, Trade and Hunger.
[1101] Ibid.
[1102] Clapp, "Food", 57-63.
[1103] See, E.M. Young, World Hunger (1997); Stephen Devereux, Theories of Famine (1993).
[1104] Ibid.
[1105] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph, 12.
[1106] Ibid.
[1107] See, for example, Clapp, "Food", 57-63.

7.1.2. Uruguay Round Agreement on Agriculture

In addition to policies under SAPs, the second reason behind the agricultural import dependency of developing countries, since the conclusion of the Uruguay Round, has to do with the adoption of AOA in 1994. When the Uruguay Round trade negotiations began in1986, as noted, there was an urgent need to introduce some discipline in agricultural trade which was at the time engulfed by protectionist policies in OECD countries.[1108] Although initially spearheaded by the U.S. provision of large subsidies to agricultural producers, in the early 1980s, the continuation of such support provision had become an expensive undertaking for the country.[1109] This was because the agricultural sector in the U.S. was submerged into crisis resulting from overproduction which led to a fall in agricultural income.[1110] The period also witnessed the well known Trade Wars between the U.S, EU,[1111] and Japan that competed against each other through the provision of support to their respective agricultural sectors.[1112] Therefore, it was with these issues in mind that agriculture became a hot topic of discussion in the Uruguay Round negotiations hence culminating in the AOA in 1994. With this background in mind, what were the underlying reasons that triggered import surges since 1994?

Studies[1113] have revealed that one of the consequences of the URAA market liberalization agenda has been hikes in food imports in developing countries which has negatively affected domestic food production. This has been a result of the tariff reduction obligation on imported food commodities under the AOA which has led to the opening up of developing countries to imports coming from developed countries.[1114] The result has led to import surges[1115] in these

[1108] Ibid; Diakosawas, "The Uruguay Round Agreement on Agriculture in Practice: How Open are OECD Markets?.

[1109] See, Jennifer Clapp, "Food", 57-63; Harriet Friedmann and Philip McMichael, 'Agriculture and the State System: The Rise and Decline of National Agricultures, 1870 to the Present", Vol, 29:2, Sociologia Ruralis, (1989). Diakosawas, "The Uruguay Round Agreement on Agriculture in Practice: How Open Are OECD Markets?". In the mid 1980's the U.S. provided $300 billion per year in OECD farm subsidies.

[1110] See, Friedmann and McMichael, 'Agriculture and the State System: The Rise and Decline of National Agricultures, 1870 to the Present"; Diakosawas, "The Uruguay Round Agreement on Agriculture in Practice: How Open Are OECD Markets?".

[1111] Ibid; Robert O'Brien, Subsidy Regulation and State Transformation in North America, The GATT and the E.U, (1997). The OECD countries provided support to its farmers which covered 40% of their incomes at the time.

[1112]See, Montana-Mora, International Law and International Relations Cheek to Cheek; Runge, The Assault on Agricultural Protectionism.

[1113] The South Center defined an import surges as imports over an import volume of 110% compared to the preceding 3-year average. See, South Centre, The Extent of Agricultural Import Surges in Developing Countries: What are the Trends? (Geneva, 2009); Tobias Reichert, 'Agricultural Trade Liberalization in Multilateral and Bilateral Trade Negotiations' in FIAN and others (eds), The Global Food Challenge: Towards a Human Rights Approach to Trade and Investment Policies (FIAN, Germany, 2009):32

[1114] See, South Centre, The Extent of Agricultural Import Surges in Developing Countries: What are the Trends? (Geneva, 2009).

[1115] The South Center defined an import surges as imports over an import volume of 110% compared to the preceding 3-year average. See, South Centre, The Extent of Agricultural Import Surges in Developing Countries: What are the Trends? (Geneva, 2009). See also, Tobias Reichert, 'Agricultural Trade Liberalization in Multilateral and Bilateral Trade Negotiations' in FIAN and others (eds), The Global Food Challenge: Towards a Human Rights Approach to Trade and Investment Policies (FIAN, Germany, 2009):32. It is important to keep in mind that the AOA is not the main reason behind import surges in developing counties. This is because the tariff bindings for developing countries agricultural products are generally in the very high band of 50 to 100 per cent

countries in which overprotected and highly subsidized developed country agricultural commodities have found their way into the domestic markets of developing countries being sold below market price.[1116] The effect this has had on different segments of society has not been similar. This is because whereas the arrival of cheap food, such as poultry and rice, imports have been beneficial to, the subsidy receiving developed country farmers and, consumers in the importing developing countries in the short-run to affordable food available in the market, in the long-run, as will be discussed further below, it has resulted in market disruptions mainly affecting urban consumers and agricultural producers in developing countries.[1117]

In this regard, a study conducted by the South Center[1118] in 2009 which assessed "The Extent of Agricultural Import Surges in Developing Countries" has clearly captured this trend. According to this study, between the years 2004-2007, fifty-six developing countries were found to have imported 16% of agricultural products as a result of an import surge.[1119] In this regard, a similar study conducted by the OECD in 2013 has assessed the underlying reasons behind import surges in developing countries.[1120] The study has concluded that the rise of import surges in developing countries has to do not only with a general rise in the volume of the imported commodities but also with the resulting increase in the price of imports.[1121]

As a consequence, a combination of lack of investment in agriculture and high rates of import surges made 80% of developing countries to be net-food importers in the late 2000s when compared to the 1980's level where only 60% of developing countries were net-food importers.[1122] Moreover, it is important to keep in mind that the agricultural sector provides key employment opportunities to agricultural producers in developing countries.[1123] In this respect, according to a 2003 FAO report on the State of Food Insecurity in the World, the share of agriculture in the economies of the developing world accounted for 9% of the Gross

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while for acceding States, the bound rates are far lower. Moreover, as part of the loan conditionalities of the IFI's, these countries have been forced to maintain far lower bound rates under their Uruguay Round bound rates.

[1116] See, Martin Khor, 'Implications of some WTO rules on the Realization of the MDGs' Third World Network Trade & Development Series 26 (TWN, Malaysia, 2005): 17–18.

[1117] Subsidized imports had also negatively affected other food exporting developed countries, inter alia, the Cairns Group, as it affected their own agricultural earnings.

[1118] See, South Centre, the Extent of Agricultural Import Surges in Developing Countries: What are the Trends? (Geneva, 2009).

[1119] Ibid. As for the effect of import surges in Least Developed Countries (LDCs) and Small and Vulnerable Economies (SVEs). The study found that even though their food import quantities are much smaller when compared to the bigger developing countries, their import surge volumes are larger in relation to their total import levels. This means that 23 percent of the total agricultural imports for LDCs take place under food import

[1120] OECD, The Role of Food and Agricultural Trade in Ensuring Domestic Food Availability in Global Food Security: Challenges for the Food and Agricultural System, (OECD Publishing, 20013): 76-77.

[1121] Ibid. Another study by FAO has shown that the frequency of import surges exceeded by 20% (i.e., one every five years) for all basic food commodities, with high frequencies for rice (40.1%), sugar (40.4%), palm oil (36.6%), cheese (36.4%) as well as wheat (35.9%), See, FAO Brief on Import Surges – Issues, Available at, http://www.fao.org/tempref/docrep/fao/009/ah491e/ah491e00.pdf, Accessed on 10/03.2018.

[1122] Ibid; 69; Beverly D. McIntyre et al., International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD): global report/edited by Beverly D. McIntyre et al (Island Press, Washington DC, 2008):255 ff. Between early 1990's and late 2000, import bills of developed countries has increased by 240% while developing countries experienced an increase of 370%.

[1123] Watkins, WTO Negotiations on Agriculture.

Domestic Prduct (GDP) while it was responsible for more than half of total employment.[1124] However, to the extent that the opening up of these economies has led to import surges,[1125] it has resulted in domestic agricultural unemployment. Moreover, the arrival of cheap subsidized commodities depressed domestic food prices, with the consequence of negatively affecting the livelihood of small-scale farmers who have been unable to compete with imported agricultural commodities.[1126]

These developments have directly exerted pressure on the right to food of agricultural producers in developing countries. At the same time, they have restrained States' policy space needed for the adoption of policies that would assist in the realization of the right to food. This is due to the fact that the ability of local farmers to ensure the availability of adequate food for themselves as well as their families has been restrained.[1127] Specifically, the recurrence of surges have constrained farmers right to feed themselves directly from productive land while it has also disrupted their agricultural productivity due to their inability to compete with the provision of cheap food. In this regard, two factors can be said to have been the root causes behind such import surges.

As already discussed, one reason has to do with the tariff reduction obligation of the AOA. Accordingly, developing countries that are members of the WTO have put their obligation into effect by lowering their import tariffs to levels below the tariffs bound under the AOA due to the fact that, as discussed above, they were already subjected to tariff reductions as part of the SAPs. This has opened up these economies to the arrival of cheap imports being sold at below market price and sometimes even below the cost of the commodity.[1128] Moreover, due to the protection OECD countries provide to their agricultural producers, the agricultural goods that enter the market from developed countries are sold at an artificially low price. In this regard, aided by the provision of big support to their producers, developed countries have come to dominate the export of basic staple foods such as wheat, rice, maize, and milk while leaving developing countries to export tropical cash crops like coffee, flower, and cotton.[1129] In this regard, a 2005 report by United Nations Development Program (hereafter; UNDP) has cautioned that "when it comes to world agricultural trade, market success is determined not by comparative advantage, but by comparative access to subsidies, an area in which producers in poor countries are unable to compete".[1130] Consequently, according to the former Special

[1124] FAO, The State of Food Insecurity in the World. According to the study, the importance of agriculture is greater in countries where hunger is more widespread; in countries where more than 34 percent of the population are undernourished, where agriculture represents 30 percent of GDP, and nearly 70 percent of the people rely on agriculture for their livelihoods.
[1125] See, FAO Brief on Import Surges - Issues,17, According to a survey covering 102 developing countries between 1980-2003, 12,000 cases of import surges have been documented.
[1126] Madeley, Trade and Hunger, 8 ff.
[1127] United Nations Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999): Paragraph 8 & 12.
[1128] See, David Fazzino, "The Meaning and Relevance of Food Security in the Context of Current Globalization Trends", Journal Land Use & Envtl. L. (2004); Ben Lilliston et al., "WTO Agreement on Agriculture: A Decade of Dumping" (2005).
[1129] Ziegler & Golay et al, "The Fight for the Right to Food: Lessons Learned", 68ff.
[1130] United Nations Development Program, Human Development Report 2005: International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World, (2005): 130.

Rapporteur on the Right to Food, Olivier de Schutter, trade-distorting agricultural subsidies have forced developing countries to lose close to $34 billion every year.[1131] This said, however, even though a reduction in export subsidies leading to complete elimination of subsidies, has been a point of discussion in the 2005 Hong Kong Ministerial meeting[1132], not much progress has been witnessed in this regard as can be seen from the continuation of provision of support in these countries. A good illustrative case in point in this regard is the U.S. which has as of 2019, authorized a 16 billion dollar bailout to its farmers in resoponse to mounting criticism from Republican farm State lawmakers on the perils of the country's trade war with China.[1133]

Hence, in this scenario, developing country producers have been unable to compete with highly subsidized developed country producers resulting in these countries being swamped by the arrival of cheap imports.[1134] The contradiction lies herein in that the same countries that were the architects for the liberalization of trade in agriculture, continued along the lines[1135] of business, as usual, making use of protectionist policies while developing countries that have a lot to lose from protectionist policies are doing away with such policies. As such, in the scenario where the rate of developing country exports into the OECD has seen a decline, as opposed to the high levels of exports taking place among and between them, developing countries have become net-food importers. This trend has especially affected local food production while at the same time risking the displacement of farming communities in developing countries.[1136] This is due to the fact that the AOA requirement on the reduction of import tariffs has served as a double-edged sword to developing countries. This is because a reduction in tariffs has opened these markets to the arrival of cheap imports from OECD countries. However, these countries were not given in turn market access in developed countries. Rather, developed countries still maintain high rates of tariff and tariff escalation on the exports (tropical cash crops) coming from developing countries.[1137] Consequently, this trend seems to be in violation of the right to food because according to the General Comment provided by the CESCR, the disposal of subsidized exports, (from OECD countries into the domestic markets of developing countries) is in contravention to the obligation to take those steps with the view to respect the enjoyment of the right to food in other countries.[1138]

[1131] See, for example, Olivier De Schutter, Mandate of the Special Rapporteur on the Right to Food, Background Note: Analysis of the World Food Crisis by the UN Special Rapporteur on the Right to Food 13 (2008).
[1132] For more, see the 2005, Hong Kong Ministerial Declaration.
[1133] Bobby Alyyn, The White House Announces $ Bilion in Aid to Farmers Hurt by China Trade Dispute, Published on, May 23, 2019, Available at, https://www.npr.org/2019/05/23/726117690/white-house-to-announce-16-billion-in-aid-to-farmers-hurt-by-trade-war-with-chin, Accessed on 18/06/2019.
[1134] Ziegler & Golay et al., "The Fight for the Right to Food: Lessons Learned", 68ff; Ying Chen, Trade, food security, and human rights: the rules for international trade in agricultural products and the evolving world food crisis, (Routledge: 2014). It is important to bear in mind that the prices of subsidized agricultural commodities are lower than the real market prices or even lower than the actual costs of the production itself.
[1135] Schoenbaum, Agricultural Trade Wars, 1165, 1181.
[1136] Ziegler & Golay et al, "The Fight for the Right to Food: Lessons Learned", 68ff.
[1137] Ibid.
[1138] See, United Nations Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 12 (1999): Paragraph 36.

Consequently, the result has seen massive surges in imports[1139] against which domestic agricultural producers do not stand a chance. Hence, the effect reverberated on the economic viability of farmers in these countries, in the sense that domestic producers have not been able to compete with the availability in the market of cheap agricultural imports. Moreover, the arrival of cheap subsidized agricultural commodities has depressed domestic food prices in developing countries.[1140] What this connotes is that agricultural producers get low income for their commodities thereby restraining their "economic accessibility"[1141] to be able to afford the food which arrives on the market.[1142] This implies that as a consequence of a reduction in tariffs, the livelihoods of small-scale farmers in developing countries have been threatened.[1143] This phenomenon furthermore violates the availability dimension of the right to food as it has restricted the ability of producers in developing countries to feed themselves[1144] while at the same time limiting their ability to make ends meet by selling their commodities locally. In light of this, the tariff reduction obligation on imports has additionally hindered the ability of governments in developing countries to raise the revenue needed to support domestic subsidies so as to prop up the agricultural sector.[1145]

As already stated, the reason for this has been the fact that local producers are unable to compete with highly subsidized developed country imports.[1146] This has weakened the competitiveness of farmers in developing countries to the point of forcing farmers either to switch economies).[1147] The effect of import surges on the right to food of producers in especially evident due to the fact that reliance on food imports has affected key sectors in

[1139] According to a study by the South Center, for LDCs, the commodities that faced import surges were cereals (wheat, barley, corn and rice) accounting for over 40% of LDCs' imports during 2004-2007 while at the same time cereals constituted the highest level of imports for other developing countries at 22%. For more, see, South Center, "The Extent of Agriculture Import Surges in Developing Countries".
[1140] Madeley, Trade and Hunger.
[1141] See, United Nations Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 12 (1999): Paragraph 13.
[1142] Olivier De Schutter, Agricultural Trade and the Right to Food, Dialogue on Globalization, Occasional Paper, No. 46. (Friedrich Ebert Stiftung, Geneva, 2009): 11-12.
[1143] Ziegler & Golay et al, "The Fight for the Right to Food: Lessons Learned", 68ff.
[1144] See, United Nations Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 12 (1999): Paragraph 13.
[1145] See, Stevens et al., The WTO Agreement on Agriculture and Food Security, 32. Such Support Measures May Include, for example, subsidized or free inputs, research and extension services, access to credit, irrigation projects and investments subsidies.
[1146] For instance, the provision of heavy subsidies by the US in relation to cotton production and the EU as regards sugar, has restrained the competitiveness of exports from agricultural producers in developing countries. This is due to the utilization of trade distorting policies that have limited their market access. Chen, Trade, food security, and human rights, 78.
[1147] Ibid; Beverly D. McIntyre et al., International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD): Global Report, 255ff; Robert Collier, Mourning Coffee; World's Leading Java Companies are Raking in High Profits but Growers Worldwide Face Ruin as Prices Sink to Historic Low, (May 20, 2001). For instance, the world's seventh-largest coffee producer, Guatemala revenues from coffee dropped by half in a matter of two years hence leading to a 40% hike in unemployment. See, Elizabeth Neuffer, The Shadows of Globalization: The Coffee Connection; Thousands of Miles Form [sic] Boston's Breakfast Tables and Fast-Food Restaurants, at the End of a Global Trade Network, Guatemala's Farmers are Barely Scraping by, BOSTON GLOBE, (July 19,2001): 2. Similarly, in Mexico, a drop in coffee prices has led to the plight of 300,000 coffee farmers from the countryside with a view to find better economic opportunities. Colombia provides a similar scenario in that unemployed farmers have been forced to flock to Southern jungles to find work in cocoa farms and cocaine laboratories.

developing countries; *inter alia*, meat and dairy production. These sectors have been important sources for local employment, food supply, and economic development.[1148]

Therefore, subsidized agricultural imports have restrained the ability of agricultural producers to make a living by selling their goods locally as they are unable to compete against cheap agricultural commodities.[1149] This is in violation of the right to food as it has denied farmers the possibility to have "**a well functioning distribution, processing and market systems** that can move food from the site of production to where it is needed in accordance with demand" (Emphasis added).[1150] As such, as this section has tried to show, import surges have restrained the right to food of small-scale farmers in developing countries by disincentivizing domestic food production (due to competition), and have clamped down on their ability to sell their goods further limiting their economic viability.[1151]

7.2. Food Aid

Another concern which has risen as a result of the URAA in relation to the right to food, is related to food aid. It is a well known trend that in situations of armed conflict as well as during periods of disaster (natural or manmade), developed countries have rendered food aid.[1152] Such delivery of aid has taken different forms although the most common ones are direct financial support as well as in kind aid provision.[1153] This said however, trends have shown that food aid has resulted in restrictive effects in the recipient countries. The reason behind this has to do with the fact that food aid has disintensivized local production in the aid receiving countries where production is still possible.[1154] For this reason, a mechanism which is aimed at ensuring the provision of food during disaster situation, has resulted in limiting the right of people to feed themselves thereby affecting the right of the public to provide food for themselves.[1155] This is due to the fact that food aid is growingly being viewed as a form of export subsidy having the aim of enhancing the commercial interest of aid providing countries.[1156] As a result, food aid has led to disruptions in local food production. This implies that rather than meeting the priorities of the aid recipient countries, aid has been used as a strategic weapon of surplus disposal for financial gains.[1157]

[1148] FAO, FAO Symposium on Agriculture, Trade and Food Security, Paragraph 19.
[1149] Madeley, Trade and Hunger.
[1150] See, UN Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 12 (1999): Paragraph 12.
[1151] Madeley, Trade and Hunger.
[1152] Ziegler & Golay et al, "The Fight for the Right to Food: Lessons Learned", 73 ff.
[1153] Ibid.
[1154] Ibid.
[1155] See, UN Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 12 (1999): Paragraph 12.
[1156] Sarah Joseph, Blame it on the WTO: A Human Right Critique, (Oxford University Press, Oxford:2011):193 194.
[1157] Ziegler & Golay et al, "The Fight for the Right to Food: Lessons Learned", 73ff.

Developed countries have used an argument that they are providing food aid while in reality they are exporting their commodities at a subsidized rate for sole commercial reason.[1158] The problem lies in the fact that the dividing line between transactions that constitute non-commercial transactions such as food aid and normal commercial transactions on the other hand is blurred.[1159] In this regard, in1981, what is constituted by food aid was a point of discussion in the EC Wheat Flour Case.[1160] In this regard, opinions differed as regards the consideration of food aid. While for the EC, food aid only refer to transactions in the form of gifts, the view of the U.S.[1161] stressed that food aid represented much more than outright gifts such as sales on concessional terms. This provides an expansive interpretation of food aid therefore making the boundary between food aid transactions and subsidized exports difficult to understand.

This said, what is the approach taken with regard to food aid in the AOA? Food aid is covered under Article 10(4) of the Agreement. The AOA provides that firstly, MS should ensure that the provision of international food aid is not tied directly or indirectly to commercial exports of agricultural products to recipient countries.[1162] Secondly, that food aid transactions are to be carried out in accordance with the FAO "Principles of Surplus Disposal and Consultative Obligations".[1163] Finally, the provision stipulates that food aid shall be provided either in a grant form or on forms no less concessional than those provided in Article IV of the Food Aid Convention of 1986.[1164] This means that food aid is to be used on a concessionary basis as set by the Food Aid Convention (FAC) while ensuring that MS exclude such transactions from the rules on export subsidies hence ascertaining that food aid will not be used on the condition that it is in any way used to circumvent the export subsidy reduction commitments of the donor Members.

In light of this, the main anxiety by LDC's and NFIDCs in relation to food aid, is related to the fact that any further reduction in export subsidy of developed countries would lead to a reduction in production and given the fact that food aid has been used as a mechanism of surplus disposal to these countries, the fear is that the availability of food commodities as a form of surplus disposal would face reduction as a result.[1165] Hence, when domestic cuts in these countries are combined with a reduction in export subsidies, the expected result is hikes

[1158] Melaku G Desta, "Food Security and International Trade Law, An Appraisal of the World Trade Organization Approach", 35 *Journal of World Trade* (2001): 449–468.
[1159] Ibid.
[1160] European Economic Community—Subsidies on Export of Wheat Flour, report of the panel, GATT doc. SCM/42, issued on 21 March 1983 (not adopted).
[1161] Ibid: Paragraph 3.20, The EC Wheat Flour panel however but failed at the end "to draw conclusions of general application".
[1162] AOA: Article 10(4)(a).; See also, The Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security, (FAO Council, 2004):Guidline 15, The relevant provision states thats that "donor States should ensure... food aid policies support national efforts by recipient States to achieve food security, base their food aid provisions on sound needs assessment, targeting especially food insecure and vulnerable groups, should be provided with a clear exit strategy and avoid the creation of dependency and donors should promote increased use of local and regional commercial markets to meet food needs in famine-prone countries and reduce dependence on food aid".
[1163] AOA: Article 10(4)(b).
[1164] Ibid: Article 10(4)(c).
[1165] Desta, Food Security and International Trade Law: 451-452.

in the price of food commodities in the world market.[1166] However, hikes in price are expected to dry up the hard currency of LDCs and NFIDCs used to finance their food imports once again leaving them dependent on food aid. [1167]

Thus, considering the above mentioned ramfications that have risen out of the improper provision of food aid by donor countries, it is imperative that the provision of food aid should at all times prioritize the alliviation of the food insecurity being faced in the aid receiving countries.[1168]

[1166] Ibid.
[1167] Ibid.
[1168] Joseph , Blame it on the WTO.

7.3. Deteriorating Terms of Trade (TOT)

Aside from import surges, agricultural trade has also restrained the food security of developing countries as a result of worsening terms of trade.[1169] This is because unequal terms of trade have constrained the duty of States to ensure food security to their population by engaging in activities with a view to strengthening people's access to and utilization of resources to ensure their livelihood.[1170] The underlying reason is, that developing countries depend on the export of commodities in order to finance their import bills from developed countries. For this reason, declining agricultural terms of trade especially since the 1970s led to a fall in purchasing power for exports.[1171] The implication of worsening terms of trade on the right to food of developing countries has vividly been seen on the affordability of exports. Additionally, changes in price, hikes in commodities imported and fluctuations in the price of export items, have in tandem exerted pressure on the right to food of developing countries.[1172]

The limits of agricultural trade liberalization on the right to food can also be seen clearly in the export sector of developing countries. Consequently, the focus in developing countries has been put on the production of few economically efficient crops (tropical goods) while developed countries have specialized in the production of staple goods such as cereals. This implies that due to focus on non-fuel primary export commodities, developing countries have not been able to enter the high-value added export market in developed countries.[1173] Aside from this, much of the processing of agricultural commodities takes place in developed countries. Therefore, the reliance on single crops (cash crops) has made the export sector much more vulnerable to market instability further exacerbating unemployment.[1174] This implies that as part of the agricultural liberalization process, the emphasis has been put on developing countries to focus on export production.[1175] However, given the fact that the price for agricultural commodities has been in decline in the international market, developing country producers have failed to get better prices for their agricultural commodities.[1176] Lack of export diversification as a result of reliance on non-fuel primary export commodities makes

[1169] See, Beverly D. McIntyre et al, International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD): global report (Island Press, Washington DC, 2008):266 ff.
[1170] See, UN Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 12: The Right to Adequate Food (Art. 11 of the Covenant), May 1999, Paragraph 12.: Paragraph, 15.
[1171] See, Beverly D. McIntyre et al, International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD): Global Report, 266 ff.
[1172] Ibid; Alemayehu, M. Industrializing Africa: Development options and challenges for the 21st century, (Africa World Press, Asmara: 2000)
[1173] For more, see UNDP, Human Development Report: International Cooperation at a Crossboards, Aid, Trade and Security in an Unequal World, 111. Sub-Saharan Africa has especially been hit by a declining share of world exports in that the region's share (excluding South Africa) of world exports has gone down to 0.3%. Hence, the total share of the region's exports with 689 million people, is less than one-half that of Belgium, with 10 million people.
[1174] Randy Stringer, Food Security in Developing Countries (Centre for Int'l Econ. Studies, Working Paper No. 11, 2000).
[1175] Madeley, Trade and Hunger, 8ff.
[1176] Ibid.

these countries highly susceptible to market fluctuations.[1177] This further contributes to declining terms of trade in the international market for developing countries.

What is more, developing countries are disadvantaged due to reliance on imports, for one, as a result of the instability of the international market resulting from price fluctuations.[1178] Moreover, the fact that the agricultural sector in these countries has been distorted due to the availability of cheap food in the market, makes it more difficult to resume their agricultural production.[1179] The effect of reliance on food imports, however, does not stop here. This is because such reliance would be more disadvantageous for these countries as they do not have a lot of foreign currency to afford imports. Such dependence on food imports has moreover made the exports of developing countries less viable as the international market for food is dominated by developed country commodities.[1180] Hence, the agricultural export sector which constituted a major source of earning for these countries has been replaced by the production of economic goods. This has resulted in the export of single agricultural commodities in these countries, making them much more vulnerable to fluctuations in the international market and leads to a decline in their export earnings.

In line with this, exports from developing countries have limited access in the international market for food commodities owing to the protectionist policies developed countries continue to utilize through high tariffs, subsidies, and, related trade barriers.[1181] This means that farmers are unable to get a fair share from their export sector as they are mainly engaged in the production of primary commodities while much of the processing is conducted in developed counties. Hence, farmers only get a small share of the net-gain from exports because much of the benefit gets distributed among the agricultural supply chain (producing, processing, packaging).[1182] As such, because farmers only get a small portion of the benefit from the export of primary commodities, their economic access to adequate food is hindered limiting further their TOT to earn revenue from engagement in processing.[1183] Moreover, OECD countries have not given much attention to how the provision of export subsidies directly exerts pressure on the right to food of developing countries as such violating their obligation to respect the enjoyment of the right to food in other countries.[1184]

Additionally, the AOA's obligation as regards export subsidies has negatively affected developing countries when it comes to the preferential market access[1185] they had enjoyed in

[1177] Sara Joseph, Blame It on the WTO: A Human Rights Critique (Oxford university Press, UK 2011): 181ff.
[1178] Ibid; Chen, Trade, food security, and human rights, 73-75.
[1179] Chen, Trade, food security, and human rights, 73-75.
[1180] Ibid.
[1181] Ibid.
[1182] See Human Rights Council, 'Report of the Special Rapporteur on the right to food, Olivier De Schutter: Building resilience: a human rights framework for world food and nutrition security', UN doc. A/HRC/9/23 (8 September 2008) Annex 1:30.
[1183] Ibid.
[1184] See, UN Committee on Economic, Social and Cultural Rights (CESCR), General Comment No. 12 (1999): Paragraph 36.
[1185] See, The World Bak, World Development Report: Agriculture for Development, 97. Such preferential market access granted to LDC's and developing countries include for instance, the United States' "African Growth and Opportunity Act" of 2000 through which the U.S. offered preferential market access to products

the EU (also in the U.S). This is due to the fact that those agricultural commodities (*inter alia*, sugar, tobacco, and horticulture) subject to heavy protectionism, had enjoyed preferential market access in the EU. Nevertheless, the AOA's requirement for market liberalization directly affects the export of these countries for one, as a result of a decline in the price of exports. Additionally, this will heighten competition with less favored suppliers that may now get preferential market access.[1186]

As such, developing countries have not been beneficiaries of the AOA's market liberalization objective on three fronts. For one, these countries have faced limitation as regards access to the high-value-added markets of developed countries due to the continued utilization of export subsidies by developed countries. This trend has led to a reduction in the income to be generated from exports owing to concentration on the production of primary commodities.[1187] Furthermore, they have not been able to access third markets as subsidized commodities have also found their way into these markets at a much lower price.[1188]Additionally, the effect has had a direct bearing on the domestic market of developing countries as a result of the arrival of cheap subsidized commodities.[1189] This means that the beneficiaries of agricultural trade liberalization have been large scale agricultural producers and MNCs at the expense of small-scale farmers that have not been able to make ends meet due to unemployment and declining prices for agricultural commodities.[1190]

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from Africa, the EU's nonreciprocal preferential market access to countries in Sub-Saharan Africa, the Caribbean, and the Pacific under the Cotonou Agreement as well as the EU's "Everything But Arms" initiative of 2003 under which the EU provided duty-free and quota-free access to its markets to UN-designated Least Developed Countries.

[1186] Stevens et al., International trade, livelihoods and food security in developing countries, 18.

[1187] Martin Khor, Implications of Some WTO Rules on the Realization of the MDGs, (Third World Network, 2005):14

[1188] Ibid.

[1189] Ibid.

[1190] T. S. Jayne et al., Success and Challenges of Food Market Reform: Experiences from Kenya, Mozambique, Zambia and Zimbabwe (1999): 8 & 32.

7.4.AOA and Ensuing International State Obligations

The other restriction posed by trade in agriculture on the right to food is related to the restrictions the AOA has put on the ability of developing countries to utilize those policies with a view to ensuring the right to adequate food. This has been so because the agreement is said to have been negotiated with the interest of developed countries (mainly EU and the U.S.) in mind at the expense of developing countries.[1191] As such, the agreement has restrained State obligation to fulfill the right to adequate food.[1192]

What have been the reasons behind? As already implied in the above discussion, the AOA's market access obligation has failed to bring about actual market liberalization for developing countries. The underlying reason for this has been the strategic use by developed countries of the AOA provisions so as to maintain the provision of support to their agricultural producers. In this regard, as already noted, OECD countries have utilized dirty tariffication, have engaged in selective tariff reductions and have used the AOA's Special Safeguards Measures (SSG) strategically.[1193] By so doing, developed countries have evaded the obligation as regards the provision of market access to developing countries.

Developing countries, on the other hand, are especially affected by the AOA's Article 5 provision on the utilization of SSG, which authorizes the imposition of additional tariffs in response to import hikes and sudden changes in price.[1194] In this regard, the AOA has excluded developing countries from undertaking SSG measures.[1195] This has been due to the fact that countries are only eligible to employ SSGs after having tariffed their non-tariff measures including the specific designation of the products concerned in a schedule. However, given the fact that most tariffication in developing countries took place earlier as part of the SAPs, these countries have not been able either to undertake tariffication or to register their specific products in the Uruguay Round negotiations.[1196] Hence, this has restrained the ability of Governments in developing countries to utilize SSGs in response to, for example, the afore -discussed import surges that have made these countries dependent on food imports. Consequently, this has narrowed down the policy space for taking measures with the view to meet the right to adequate food. In this scenario where developing countries

[1191] Tobias Reichert, "Agricultural Trade Liberalization in Multilateral and Bilateral Trade Negotiations" in FIAN and others eds., The Global Food Challenge: Towards a Human Rights Approach to Trade and Investment Policies (FIAN, Germany, 2009):31.
[1192] For more, see, Schutter, International Trade in Agriculture and the Right to Food, Mark Ritchie & Kristin Dawkins, WTO Food and Agricultural Rules: Sustainable Agriculture and the Human Right to Food, Vol. 9 Minn. J. Global Trade (2000).
[1193] Sturgess, The Liberalisation Process in International Agricultural Trade, 85.
[1194] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 5.
[1195] Ibid.
[1196] United Nations Development Program (UNDP), Making Global Trade Work for People 120 (2003):114; The WTO Agreement on Agriculture and Food Security 3 (Christopher Stevens et al. eds., 2000):41. The SSG mechanism was triggered by only 10 members, including 6 developing countries, between 1995 and 2001; and between 1995 and 2004, developing countries triggered the SSG in only 1 per cent of the cases in which they could have applied it. For more, see FAO, Trade Policy Briefs on Issues Related to the WTO Negotiations on Agriculture, No. 9 A, Special Safeguard Mechanisms for Developing Countries, available at: ftp://ftp.fao.org/docrep/fao/008/j5425e/j5425e01.pdf.

have not been able to invoke the SSG, they have been victims of import surges (for instance in meat and dairy), as discussed above, being provided at a low price which served as a disincentive for domestic food production.[1197]

The other reason has to do with the tariff reduction commitments of the AOA.[1198] As already discussed, developed countries have a 36% reduction commitment under the AOA during the base year (1995-2000).[1199] They have engaged in a selective reduction in order to protect their domestic producers. On the contrary, developing countries have adopted uniform levels of reduction for all agricultural products.[1200] This precludes developing countries from the utilization of tariffs to protect sensitive agricultural products as well as domestic producers from unfair competition. As such, the AOA's agricultural trade liberalization effort through the means of a reduction in trade-distorting policies such as tariffs has led to a reduction in government revenue needed for the provision of domestic support through the means of domestic subsidies such as the free inputs, access to credit, research and extension services.[1201]

The realization of the right to food of developing countries has also been restrained by the AOA's export subsidies obligation. This has been due to the fact that even though developing countries are under lower export subsidy reduction commitments compared to developed countries, the fact that developing countries had not subsidized their export sector before the coming into force of the AOA in 1995 makes the lower reduction commitment of less relevance for enhancing the food security.[1202] Moreover, the agreement's prohibition on the introduction of new export subsidies has made it impossible for States in developing countries to utilize those domestic policies with the aim of enhancing the realiztion of the right to food.[1203]

Moreover, the domestic support reduction obligation of the AOA puts an obligation on developing countries to bring down such support provision. The obligation as regards reduction in domestic support has additionally constrained the ability of developing countries to realize the right to food. This is due to the fact that a reduction in the domestic support obligation puts limits on these countries to encourage agricultural production through the employment of different strategies, *inter alia*, input subsidies, research and extension services, and irrigation projects.[1204] Furthermore, only a few developing countries have made use of domestic support during the base year 1986-88. Even if developing countries can make use of a "*de minimis*" level of domestic support provision of up to 10%, the AOA has constrained the

[1197] FAO, FAO Symposium on Agriculture, Trade and Food Security, 75.
[1198] For more, see, section 4.2 of this chapter.
[1199] See, Sturgess, The Liberalisation Process in International Agricultural Trade, 147.
[1200] FAO, FAO Symposium on Agriculture, Trade and Food Security, 20.
[1201] See, Stevens et al., The WTO Agreement On Agriculture and Food Security, 32. Such subsidies include subsidized inputs, research and extension services, access to credit, irrigation projects and investments subsidies
[1202] See, Anwarul Hoda & Ashok Gulati, Special and Differential Treatment in Agricultural Negotiations, Capri Conference, Working Paper, No. 100 (Indian Council for Research on International Economic Relations, 2003). In the period 1995-1998, only twelve developing countries made export subsidy reduction commitments.
[1203] Gonzales, "Institutionalizing Inequality", 482-488.
[1204] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article, 6(4)(b).

utilization of the option for these countries to ensure the right to adequate food by setting the threshold at 10%.[1205] Moreover, as part of the requirement to reduce domestic support, many developing countries had already introduced (under SAPs) cuts to their support measures such as input subsidies. Hence, in the absence of domestic support provision by States in developing countries, the ability of small-scale farmers to afford inputs has been threatened.[1206] Reduction in domestic subsidies in developing countries has meant that inputs have been provided to farmers at a higher price thereby making agricultural production less viable for agricultural producers.[1207] This trend has been in violation of the right to food of farmers due to the fact that because of the withdrawal of the State from domestic support provision, they will face higher costs so as to access inputs at an affordable price.[1208] Consequently, this constrains the "economic accessibility" of adequate food to farmers merely because they are now required to pay more in order to access inputs.[1209] As a consequence of this, agricultural producers have not been able to purchase their food for themselves and their household at an acceptable price.

Thus, the URAOA, by making the adoption of policies by developing countries in order to meet their national food security concerns via the means of domestic support and export subsidies, a prohibition to its provisions, has snatched key means of domestic policy. As such, this has, in turn, made it more difficult for these States to "fulfill"[1210] their obligation as regards the realization of the right to adequate food.

[1205] Ibid.
[1206] Madeley, Trade and Hunger, 8.
[1207] Sophia Murphy, Trade and Food Security: An Assessment of the Uruguay Round Agreement on Agriculture 39 (1999): 25.
[1208] Murphy, Trade and Food Security, 25; The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), General Comment 12 (1999): Paragraph 13.
[1209] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.
[1210] Ibid, Paragraph 15.

8. Restrained Remedies for a Way Out: The AOA's Take on Addressing Gaps

With due consideration of the gaps that have come to define the AOA, the section below will assess mechanisms the Agreement has provided in order to address these shortcomings and the extent to which they can be relied upon to address the above-discussed problems.

As provided under the preamble of the AOA the afore-discussed reform measures should be put into effect in a manner which is equitable with what it considers as "non-trade concerns".[1211] The agreement specifically provides in this regard that non-trade concerns such as food security and environmental protection issues have to be an integral component of the reform programme.[1212] In this regard, for instance, the AOA exempts those government support measures of "assistance which are aimed at **encouraging agricultural as well as rural development, investment subsidies already available in developing countries and agricultural input subsidies** as are available to low income developing country members" (Emphasis added), from domestic support reduction commitments.[1213] This said, however, the provisional flexibilities which give due recognition to food security in the AOA only attempt to address the problems identified through more agricultural trade liberalization.[1214] This implies that the AOA, as noted above[1215], is based on the premise that international agricultural trade is instrumental for ensuring food security. It connotes that international trade will lead to allocative efficiency and that if all countries specialize in the production of goods over which they have a comparative advantage, countries will gain from export earnings for buying food.[1216] Moreover, even though the inclusion of food security as an important non-trade concern is in line with the ICESCRs provision that requires MS to ensure that the right to food is given due consideration in international agreements[1217], there is deficiency which can be observed when it comes to how to incorporate food security within the WTO framework.[1218] Such a difficulty still persists as regards the policy space for the exercise of food security which is fraught over in the Doha Round of negotiations[1219] mainly by developed countries.[1220] In this regard, notwithstanding the fact the inclusion of food security in the AOA as an important non-trade concern requiring special attention is a good

[1211] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Preamble.
[1212] Ibid.
[1213] Ibid, Article 6(2).
[1214] Schutter, International Trade in Agriculture and the Right to Food in Accounting for Hunger, 149.
[1215] For more, see the discussion under section 3(1)(2).
[1216] Schutter, International Trade in Agriculture and the Right to Food in Accounting for Hunger, 145-146.
[1217] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), General Comment No. 12 (1999): Paragraph, 16.
[1218] Christine B. Kaufmann, Right to Food: The Right to Food and Trade in Agriculture in Human Rights and International Trade (Thomas Cottier et al eds, Oxford Scholarship Online), (2012):350.
[1219] With due recognition to article 20 of the AOA that stresses on the long-term objective of substantial progressive reductions in support and protection, resulting in fundamental reform, as an on-going process, WTO Members initiated negotiations to continue the process. To this end, the negotiations began since November 2001 in Doha, Qatar. For more, see Ministerial Declaration, WTO Ministerial Conference, 4th Sess, Doha, WTO Doc WTIMIN (01)/DEC/1 (20 November 2001) (adopted on 14 November 2001).
[1220] For more, see, Matias Margulis, "The Regime Complex for Food Security: Implications for the Global Hunger Challenge" Vol. 19 No. 1 (Lynn Rinner Publishers 2013).

due recognition, the AOA nevertheless vows to fulfill this goal through more market liberalization and trade.[1221]

Moreover, the AOA aims to minimize the negative effects of the reform process through the employment of Special and Differential Measures (SDM) for developing countries as a vital part of the reform process.[1222] The agreement has sought to address this by giving developing and LDCs that have been disadvantaged in the multilateral trading regime due to their financial, technical, institutional capabilities, with longer implementation periods, reduced reduction commitments as well as by granting the flexibility for the employment of development policies that would have otherwise been prohibited.[1223] In this regard, for instance, Article 15(2) of the AOA, as already highlighted, gives a 10 year period for the implementation of commitments for developing countries while exempting LDCs from any reduction commitments.[1224] This said even though SDM provisions would remedy some of the burdens that the liberalization process has caused, they fall short of addressing, at its core, the challenges most pertinent to the needs of developing countries. For instance, the problems caused by institutional and financial capacity are of special concern for developing countries to be able to help them implement their commitments and take advantage out of the reform process for example in terms of increased market access.[1225]

Furthermore, with a view to offset the negative effects that ensue during the implementation process of the reforms discussed above, such as hikes in price leading to unaffordable imports, Article 16 of the AOA provides for the taking of measures by developed country MS aimed at minimizing the negative effects the reform Process may have especially on NFIDC) and LDCs.[1226] Accordingly, this is to be done through the taking of measures under the 1993 Ministerial Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries (Marrakesh Decision).[1227] In this regard, the Decision has specified the possibility of how the reform process may restrict the availability of food from external sources while also cautioning the

[1221] For more, see, Olivier De Schutter: International Trade in Agriculture and the Right to Food, No. 46. (Geneva, Friedrich-Ebert-Stiftung, 2009):15-18. With due consideration that trade will lead to allocative efficiency in that countries will engage in the production of those goods over which they have a comparative advantage which will generate the revenue needed to be able to afford their imports.

[1222] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Preamble; GATT, BISD 26/S, the principle of Special and Differential Treatment to Developing Countries is not a novel idea of the AOA. This is because, the GATT had dealt with the issue through the adoption of the "Enabling Clause" on 28 November, 1979. The full title of the Decision was "Differential and More Favourable Treatment, Reciprocity and Fuller Participation of Developing Countries".

[1223] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Preamble and Article 15(1&2).

[1224] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Preamble, Article 15(1, 2), Article, Article 6(4) & 9(2).

[1225] Jordana Hunter, "Broken Promises: Trade, Agriculture and Development in the WTO", Melbourne Journal of International Law, Vol 4, (2003): 13.

[1226] For more on the measures that have been adopted with regard to LDCs, see, Decision on Measures in Favour of Least-Developed Countries, WTO Doc LT/UR/D-1/3 (15 April 1994).

[1227] See, Marrakesh Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries, Decisions adopted by the Trade Negotiations Committee on 15 December 1993 and 14 April 1994.

difficulty this may cause on the affordability of basic foodstuffs.[1228] In this regard, the decision specifically provides that NFIDCs,

> "may experience negative effects in terms of the availability of adequate supplies of basic foodstuffs from external sources on reasonable terms and conditions, including short-term difficulties in financing normal levels of commercial imports of basic foodstuffs".[1229]

The Marrakesh decision has moreover provided response mechanism to address the gap which has been created, *inter alia*, by the sufficient provision of food aid, the provision of technical and financial assistance to least-developed and NFIDCs to improve their agricultural productivity and infrastructure, the provision of favorable terms for agricultural export credits and the establishment of short-term financing facilities for developing countries in order to allow them to maintain normal levels of commercial imports.[1230] This said however, there is no mechanism in the WTO to monitor the effect of the AOA reform process on NFIDCs except for most extreme circumstances that call for a trigger of the Marrakesh decision.[1231] What is more, no substantive measures have been taken given the decision's non-binding nature.[1232] As such, MS have failed in effectively implementing their commitments under the Marrakesh Decision. The reason for this has to do with the fact that the Ministerial decision has not resulted either in pragmatic rights or feasible obligations.[1233]

This said, what are the remedies provided by AOA to counteract for import surges in developing countries? The remedies provided for under the AOA in order to counteract for import surges include the Peace Clause, the SSGs, Article XIX of GATT as well as the provisions in Agreement on Safeguards which are, as will be seen below, for the most part, complex and rigid. Firstly, the fact that the Peace Clause has expired as of 1st January 2004[1234], has made agricultural subsidies challengeable under the Agreement on Subsidies and Countervailing Measures (SCM).[1235] The SCM renders certain subsidies actionable given they have caused harm to the local industry. In this regard, subsidies employed which are in compliance with the AOA, were not challengeable until the ending of the Peace Clause in 2004 which opened the use of agricultural subsidies to be challengeable under the SCM.

[1228] Ibid.
[1229] Ibid, Paragraph 2.
[1230] Ibid.
[1231] UNCTAD, Impact of the Reform Process in Agriculture on LDCs and Net Food-Importing Developing Countries and Ways to Address Their Concerns in Multilateral Trade Negotiations, UN Doc. TD/B/COM.1/EM.11/2.
[1232] Olivier De Schutter, International Trade in Agriculture and the Right to Food, Dialogue on Globalization Occasional Paper No. 46, (Friedrich Ebert Stiftung, Geneva, 2009):15.
[1233] Ibid: paragraph 3(I-II), This is with the exception of the provisions relating to food aid and concessionality which have produced actual results.
[1234] Prior to expiry of the peace clause in 2001, Brazil was able to successfully challenge some of US cotton subsidies. The subsidies were found not to comply with AoA requirements for which reason were not protected by the peace clause. As a result, they were consequently actionable under the SCM. Also see, EU-Export Subsidies on Sugar, United States—Subsidies on Upland Cotton, WTO docs. WT/DS297/R (8 September 2004) (Report of the Panel) and WT/DS267/AB/R (3 March 2005) (Report of the Appellate Body)., European Communities-Export Subsidies on Sugar, WTO docs. WT/DS265/AB/R, WT/ DS266/AB/R and WT/DS283/AB/R, AB- 2005- 2 (28 April 2005) (Report of the Appellate Body); Joseph, Blame it on the WTO, 89-90.
[1235] See, General Agreement on Tariffs and Trade, (October 30, 1947): Article XVI.

However, the expiration of the Peace Clause has not yielded substantive legal results owing to financial costs associated with challenging such action as well as, in some circumstances, geopolitical consequences.[1236] Given this, another mechanism that could have been utilized is the SSG. As noted, the AOA only authorizes the employment of SSGs by MS to protect their agricultural sector in response to import surges and hikes in price to those products that have undergone tarrification prior to the coming into force of the AOA.[1237] This means that the option is off limits to most developing countries that have utilized other protectionist measures in their agricultural sectors rather than tariffs.[1238] Hence, an important mechanism that would have enabled developing countries to protect themselves against dumping policies, has not been utilized. Additionally, Article XIX of GATT, as well as the provisions in the Agreement on Safeguards under which temporary restrictions on imports are authorized with the view to give competing local industries time to adjust, could be employed so as to curtail agricultural import surges. Nevertheless, the utilization of this mechanism is complex[1239], because the MS that seeks to make use of this option is required to prove that an import surge has caused serious harm to its local industry. The MS in question is moreover required to differentiate harms caused by other factors and in doing so, ascertain why the other factors are not behind the harm caused.[1240] As such, due to the difficulty in predicting the frequency in the occurrence of import surges and the fact that safeguards will be employed only after the provision of compensation to the State so affected, the application of this option has been deemed intricate.[1241] Hence, this requirement would be cumbersome for poor developing countries to rely on this option.[1242] For the reasons discussed above, safeguard measures have served a little role in protecting developing countries from surges in imports.

In addition to the above-mentioned measures, Article 20 of the agreement calls for the continuation of the negotiation process with the view to hastening the liberalization process in agriculture. The provision as such has given due recognition to the ongoing nature of the long-term objectives of reduction in support provision and protection commitments.[1243] Accordingly, this is to be achieved with due consideration to the experience in the

[1236] Randy Schnepf and Jasper Womach, 'Potential Challenges to US Farm Subsidies in the WTO: A Brief Overview', CRS Report for Congress (25 October 2006): 2.
[1237] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 5; WTO, 'Market Access: special agricultural safeguards (SSGs)', http://www.wto.org/english/tratop_E/agric_e/negs_bkgrnd11_ssg_e.htm, accessed on 18/06/2018. Even though, 39 WTO members, including 22 developing States, have reserved the right to use such safeguards, they have rarely been used by developing country MS due to the complex nature of the rules.
[1238] This right exists only in respect of products for which countries have expressly reserved the right to do so in their schedules of commitments.
[1239] Robert Howse and Ruti Teitel, 'Beyond the Divide: The Covenant on Economic, Social and Cultural Rights and the World Trade Organization' in Sarah Joseph, David Kinley, and Jeff Waincymer, The World Trade Organization and Human Rights: Interdisciplinary Perspectives (Edward Elgar, Cheltenham, 2009):54–5; Aileen Kwa, 'African Countries and EPAs: do Agricultural Safeguards afford Adequate Protection?', South Centre Bulletin: Reflections and Foresights (2008): 25
[1240] Ibid.
[1241] See, Peter Van den Bossche, The Law and Policy of the World Trade Organization (Cambridge University Press, Cambridge, 2005):633-634.
[1242] Ibid.
[1243] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Article 20.

implementation of the commitments as stipulated in the AOA, the effect these commitments may have on global trade and what is termed as non-trade concerns which include "special and differential treatment to developing country Members including the objective to establish a fair and market-oriented agricultural trading system".[1244]

As such, building on this commitment for the continuation of the negotiation process, in 1999 the tone was set with the WTO Ministerial Meetings which started in Seattle.[1245] However, the motivation for the change was short-lived in that the meetings had to be discontinued due to the infamous WTO-protests. The main theme of the protests centered around the fact that concerns of developing countries including environmental questions were not benefiting out of the multilateral trading regime.[1246] Hence, they claimed that international trade rules were tilted towards the interests of developed countries. Therefore, the Ministerial meeting in 1999 did not bear any fruit. It will have taken a few years to start a new round of negotiations in Doha, Qatar in 2003.[1247] The Doha Ministerial meeting was distinct for the fact that the discussions focused on the interest of developing countries. The Doha Development Round (DDR), as the meetings were called thereafter, centered on agricultural trade reform with the view to make developing countries beneficiaries from the sector.[1248] Additionally, the start of the DDR also saw strong participation by developing countries[1249] that started to press for SDT which included a lower reduction commitment for their tariff and subsidies and special treatment for their agricultural sectors so that they can protect their agricultural sectors. Consequently, the Doha Round deliberated on due consideration to be given to SDT and non-trade concerns to developing countries as it was agreed that it constituted an integral part of the WTO agreement.[1250] Moreover, the negotiations aimed to bring about improvements in market access increased reduction with the view to completely eliminate export subsidies and

[1244] Ibid; International Institute for Sustainable Development, "The Development Box" (2003); Takumi Sakuyama, "A Decade of Debate over Non-Trade Concerns and Agricultural Trade Liberalisation: Convergences, Remaining Conflicts and a Way Forward", International Journal of Economic Resources Vol 5, No 4. (2005). Prior to the start of the Doha Round negotiations, developing countries, led by India and Pakistan, had called for the inclusion of a "Development Box" and "Food Security Box" to be part of a reformed AOA. This was due to the need to ensure that the SSGs as provided in the Agreement favored the kind of SSG policies that reflected developed countries.

[1245] See, WT/MIN (99)/W/ Ministerial Conference Seattle.

[1246] See, The Guardian, Real Battle for Seattle, published on 5/9/1991, accessed on 25/06/2018, https://www.theguardian.com/world/1999/dec/05/wto.globalisation,

[1247] For more, see, Ministerial Declaration, WTO Ministerial Conference, 4th Sess, Doha, WTO Doc WTIMIN(01)/DEC/1 (20 November 2001) (adopted on 14 November 2001).

[1248] Ibid.

[1249] For more on participation of developing countries, see, Matias Margulis, "The Regime Complex for Food Security: Implications for the Global Hunger Challenge", Global Governance Vol. 19. No. 1. (2013): 53.
Amrita Narlikar and Diana Tussie, "The G20 at the Cancun Ministerial: Developing Countries and Their Evolving Coalitions in the WTO" The World Economy Vol. 27. No. 7. (2004); Amrita Narlikar and Rorden Wilkinson, "Collapse at the WTO: A Cancun Post-Morten", Third World Q, Vol. 25, No. 3 (2004); Kristen Hopewell, "Different Paths to Power: The Rise of Brazil, India and China at the World Trade Organization", Review of International Political Economy, Vol., 22. No. 2 (2015). The G-20 group as led by Brazil and India, along other developing countries including China and South Africa, became a major negotiation block as they represented 2/3 of global population and large number of farmers. Moreover, the G-33 Group was there which called for special treatment in the form of exemptions from tariff cuts for "special products" (SP) considered important for food security and a "special safeguard mechanism" (SSM) by which to protect developing countries from surges of cheap subsidized imports.

[1250] ICTSD, "Agriculture" Doha Round Briefing Series: Cancun Update, Vol.2, No.2, (August, 2003a):2.

a significant reduction of trade-distorting domestic subsidies.[1251] In this vein, the Doha Ministerial Declaration set a new mandate by establishing a new deadline for implementation.[1252] The modalities for the commitment of countries was set to be concluded by March of 2003 along with the comprehensive draft schedules that had to be submitted by the Ministerial Conference of September 2003 in Cancún.[1253] This said, however, disagreements over the extent to which developing countries should be granted SDT weakened the negotiation.[1254] In this regard, not surprisingly disagreement between the U.S. and EU on the issue of market access and subsidies made the Doha Round inconclusive. Even though the Doha Round has been engulfed with such disagreements, in 2005, at the Ministerial meeting that was held in Hong Kong, an agreement was reached as regards the elimination of export subsidies by 2013.[1255] This said another stumbling block of disagreement between the EU and US has centered on the phasing out of food aid. Notwithstanding the fact that an agreement was reached in 2008 to phase out food aid sales of the U.S., the very process of the deliberation has made the negotiations lengthy. The 2013 Bali Ministerial meeting has added further to the complexity of the Doha Round. This has been because even though focus was put on the use of trade measures for food security, developing countries have been pressing for clearer rules in the AOA that would give them the policy space to pursue domestic policies with the aim of ensuring food security – such as public stockholding schemes designed to address hunger and food insecurity.[1256] This is because " Doha Round takes an approach of a single undertaking spanning all of the areas of negotiation, including the non- agricultural issues, nothing is agreed until the entire agreement is finalized".[1257]

In conclusion, the provisions of the AOA are of limited significance for developing country MS to rid-off the afore-discussed challenges in relation to the right to food. Even though there is hope in the inclusion of food security concerns as an integral non-trade concern part of the Doha Round negotiations that started in 2001, the fact that nothing substantive has come out of the negotiations until now, has weakened expectations. It is yet to be seen if the reform process will result in a fair and market-oriented trading system under which the interests of all parties- developing and developed countries alike - are taken into consideration.

[1251] See, Doha Ministerial Declaration (28 November 2001), WT/MIN(01)/DEC/1 (20 November 2001), Paragraph 13.
[1252] Ibid.
[1253] Ibid, Paragraph 13 and Paragraph 14. "Modalities for the further commitments, including provisions for special and differential treatment, shall be established no later than 31 March 2003".
[1254] See, Margulis, "The Regime Complex for Food Security, 53.
[1255] Gonzalez, “Institutionalizing Inequality”, 29. The measures set out in the Doha Ministerial meetings set deadlines as regards, modalities for countries’ commitments should have been concluded by the end of March 2003 and comprehensive draft schedules had to be submitted in 2003 in the Ministerial Conference to be held in Cancún.
[1256] Clapp, Food security and International Trade Unpacking Disputed Narratives.
[1257] Clapp, Food, 81.

9. How Does the Lack of Access to Results of Scientific Progress in International Trade Constrain the Right to Food?

Before advancing to an analysis of the constraints put on the right to benefit from science (Article 15.1(b) of the ICESCR), it is important to briefly assess what is meant by technology transfer and how it takes place.

Even though there have been different attempts aimed at defining what is implied by the notion of international transfer of technology (hereafter, ITOT)[1258], there is currently no international consensus regarding its meaning.[1259] For instance, UNCTAD's Code of Conduct on the Transfer of Technology (hereafter, Code of Conduct on TOT) which was negotiated between 1978 and 1985, defined it as, "the transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service" however excluding non-commercial technology transfer modalities.[1260] This said UNCTAD negotiations have failed to bring about substantive results which means that currently there is no internationally recognized definition of ITOT.[1261] In spite of the absence of a standard definition, ITOT takes place whenever a "party from one country gains access to a foreign party's information and successfully learns and absorbs it into its production function".[1262]

This said, which provisions of the WTO deal with ITOT? With due consideration of the importance of trade on technology transfer, the WTO has dealt with TOT, for instance, under Articles 7, 8 and 66 (2) of the TRIPS agreement.[1263] In this regard, the latter provision - although stated in general terms - stresses on the importance of establishing a "technology

[1258] See, for example, Robert A. Burgelman et al., Strategic Management of Technology and Innovation, (McGraw-Hill/Irwin: 2008); Padmashree Gehl Sampath & Pedro Roffe, Unpacking the International Technology Transfer Debate Fifty Years and Beyond, Working paper, (ICTSD, Geneva: 2012).

[1259] UNCTAD, Transfer of Technology and knowledge sharing for development, Science, technology and Innovation issues for developing countries, UNCTAD Current Studies on Science, Technology and Innovation, No. 8, (2014, United Nations, New York and Geneva): 15-20.

[1260] See, UNCTAD, "Draft International Code of Conduct on the Transfer of Technology as of 5 June 1985" (TD/CODE/Technology Transfer/47, 1985): Article 1.2. The Draft Code on Technology Transfer failed to bring about substantive commitments due to ensuing disagreements between developed and developing countries. Hence, the final code was adopted in 1985 as an instrument with no binding commitments for the transfer of technology to the developing world. See also, United Nations Conference on Trade and Development, UNCTAD Series on issues in international investment agreements, (United Nations, New York & Geneva):15; M. Blakeney, Legal Aspects of Technology Transfer to Developing Countries (Oxford: ESC Publishing 1989). The definition provided for what is meant by technology transfer was narrow in that it did not cover non-commercial transactions such as those found in international cooperation agreements between developed and developing countries that relate to infrastructure or agricultural development, or to international cooperation in the fields of research, education, employment or transport.

[1261] UNCTAD, Transfer of Technology and knowledge sharing for development, Science, technology and innovation issues for developing countries, 15-20.

[1262] Working Party of the Trade Committee, International Technology Transfer Measures in an Interconnected World: Lessons and Policy Implications, (OECD, 2017), TAD/TC/WP(2017); K.E. Maskus, (2004), Encouraging International Technology Transfer (Vol. 7), Geneva: International Centre for Trade and Sustainable Development.

[1263] See, Agreement on Trade-Related Aspects of Intellectual Property Rights, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, (April 15, 1994) Article 7, 8(2) and 66(2). Article 7 states that the protection of intellectual property rights (hereafter IPRs) should lead to the promotion of technological innovation and the transfer and dissemination of technology while under Article 8, it acknowledges the taking of appropriate measures aimed at preventing the abuse of IPRs holders that will restrain trade and the international transfer of technology.

transfer by developed countries to least-developed countries in order to help them establish a sound and viable technological base".[1264] Likewise, other Agreements of the WTO have incorporated similar provisions on ITOT.[1265] Moreover, ITOT is also covered under the AOA. The provisions that deal with this are to be found under Annex 2 of the Agreement which covers domestic support measures that are exempt from reduction commitments.[1266] The provisions therein deal with policies in relation to programmes which provide services or benefits to agriculture or the rural community which is inclusive of, *inter alia*, environmental research programmes and those relating to particular products; as well as the provision of, training services (general and specialist training facilities), including advisory services, given with a view to hasten the transfer of information and research results to producers and consumers and infrastructural services.[1267] The "Marrakesh" Decision has also stressed the need to give recognition, in the context of aid programmes, to technical as well as financial assistance to LDCs and NFIDC.[1268]

Besides these Agreements that render due recognition to ITOT, since 2001, with a view to finding a clear understanding of the relationship between trade and technology transfer, developing countries made a proposal to discuss the issue further at the 4th Ministerial meeting that was to be held in Doha, Qatar.[1269] Hence, at the Ministerial meeting in 2001, an agreement was reached for the establishment of a Working Group on Technology Transfer as per Article 37 of the Doha Ministerial Declaration.[1270] Hence, the Working Group was tasked with, among other things, the assessment of the relationship between trade and the transfer of technology as well as the incorporation of recommendations made by MS aimed at integrating within the WTO framework technology transfer to developing countries.[1271] The Working

[1264] TRIPS: Agreement on Trade-Related Aspects of Intellectual Property Rights, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, (April 15, 1994): Article 66.2; Suerie Moon, Meaningful Technology Transfer to the LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66, Policy Brief No 9, (CTSD 2011). Carlos M. Correa, Intellectual Property in LDCs: Strategies for Enhancing Technology Transfer and Dissemination (2007). These researchers have shown that the results of the inclusion of this provision in the TRIPS agreement have been modest until now. This can be due to the fact that the agreements monitoring system is inefficient to examine implementation in this regard.

[1265] For more, See, Article 9 of Agreement on the application of Sanitary and Phytosanitary (SPS) Measures, Agreement on Technical barriers to Trade (TBT): Article, 11, General Agreement on Trade in Services (GATS): Article IV & XIX. Moreover, TOT is also incorporated under Article 23 of the Nagoya Protocol on Access and Benefit-sharing Arising from the Utilization of the Convention on Biological Diversity and Convention on Biological Diversity, Article 16.; UN General Assembly, Declaration on the Right to Development : resolution / adopted by the General Assembly, 4 December 1986, A/RES/41/128:Articles 1 and 2.

[1266] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Annex 2(a, c, d & g), Article 11 & Article 16; Decision Concerning the Possible Negative Effects of the Reform Program on Least Developed Countries and Net Food-Importing Developing Countries.

[1267] See, Agreement on Agriculture, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994): Annex 2(a, c, d & g), Article 11 & Article 16. The provision of infrastructural services is inclusive of electricity reticulation, roads and other means of transport, market and port facilities, water supply facilities, dams and drainage schemes, and infrastructural works associated with environmental programmes.

[1268] See Marrakesh Decision: Paragraph 3(iii).

[1269] See, WT/GC/W/443 of 18 September 2001.

[1270] See, Doha WTO Ministerial: Ministerial Declaration, WT/MIN(01)/DEC/1, (2001): Paragraph 37.

[1271] Ibid. More specifically, the Working Group has been mandated to; carrying out assessment of needs of developing countries for transfer of technology; identifying the problems and constraints faced by developing countries in gaining access to the needed technology available in developed countries including pricing policies, examining all the WTO Agreements to identify any constraints that certain provisions in these Agreements may be creating against transfer of technology to developing countries; assessing the implementation by developed

Group has in 2003, before the Cancun Ministerial meeting, started an examination of the recommendations submitted by developing countries. Given the importance of the relationship between ITOT in international trade, the work of the Working Group, although incomplete, is a step in the right direction.

With this in mind, it is important to understand how trade leads to ITOT. ITOT significantly determines economic growth and development. This means that both the acquisition of technology by a country as well as its diffusion to broad users is expected to enhance national productivity.[1272] In this regard, recalling the afore discussions on the benefits of international trade, it has been disclosed that international trade determines resource allocation with ramifications on domestic policies.[1273] Hence, for this reason, trade highly shapes the conduct of technology transfer. This implies that even though the transfer of technology between countries takes place in different ways; market-based[1274], as well as non-market based[1275] modalities, trade serves as an important means through which technology is transferred.[1276] More specifically, trade provides the avenue for ITOT through the import of capital goods such as, for example, new machinery, equipment and services by firms in developed countries to developing Nations.[1277] In this regard, there is broad consensus on how the import of goods contributes to the TOT because the research and development embedded in the goods so transferred is expected to have a positive impact on the total productivity of the importing country.[1278] While the importance of ITOT in the promotion of economic growth in the importing country is obvious, there is a huge disparity in the capability of countries to produce new technology meaning that the trend so far has been that OECD countries dominate the production of new technology. Hence, this means that in order to access new productive knowledge, developing countries would have to rely on imported technologies.[1279]

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countries of all WTO provisions related to transfer of technology to developing countries with a view to identifying the needs for appropriate changes/strengthening of these provisions, assessing the implementation by developed countries of all WTO provisions related to transfer of technology to developing countries with a view to identifying the needs for appropriate changes/strengthening of these provisions; and studying the design of instruments and incentives, including tax incentives, that developed countries could grant to enterprises and institutions in their own territories in order to disseminate and transfer technology to developing countries.

[1272] Bernard M. Hoekman et al., Transfer of Technology to Developing Countries: Unilateral and Multilateral Policy Options, World Bank Policy Research Working Paper 3332, (2004).

[1273] UNCTAD, Transfer of Technology and knowledge sharing for development, Science, technology and Innovation Issues for Developing Countries, 15.

[1274] Market based TOT may include for example, imports, Foreign Direct Investment, and technology licensing. See also, Hoekman et al., Transfer of Technology to Developing Countries, 2-3.

[1275] Non-market based modalities include, reverse engineering, research based on freely available or paid information (e.g. published patent applications, published research, conferences) or personal movement of key individuals. See, Maskus, Encouraging International Technology Transfer.

[1276] UNCTAD, Trade and Development Report, UNCTAD/TDR/2007, (United Nations, New York and Geneva: 2007). Market based avenues of technology transfer include trade, FDI, or licensing while non-market based modalities include, among other things, technical assistance projects or NGOs. See also, Sebastian Valejjo, International Technology Transfer Measures in an Interconnected World: Lessons and Policy Implications (Working Party Of The Trade Committee, 2017), Tad/Tc/Wp(2017).

[1277] UNCTAD, Technology and Innovation Report, Enhancing Food Security in Africa Through Science, Technology and Innovation, UNCTAD/TIR/2009 (United Nations, New York and Geneva: 2010): 85ff.

[1278] See, David T. Coe and Helpman Elhanan, "International R&D Spillovers", European Economic Review 39: (1995): 859-87.

[1279] Hoekman et al., Transfer of Technology to Developing Countries, 2-3.

The conduct of ITOT is based on two considerations. The first consideration stipulates that when goods are traded between countries, the technology embedded in them is also transferred.[1280] The second pillar makes the transfer of technology to be dependent upon the cost of access. Accordingly, this view considers trade liberalization which includes, among other things, a reduction in legal, regulatory as well as political barriers, for goods that have a high technology component, to serve an important role for the TOT while on the contrary trade practices that are restrictive are expected to make the transfer much more costly.[1281]

This said, how does technology transfer take place? Technology transfer takes place given that there is an incentive by firms (in this case, agribusiness MNCs) to commercialize a particular innovation through trade.[1282] Hence, technology is only transferred when it is expected to result in commercial and financial gains. Additionally, in spite of the importance of technology transfer to enhance national productivity, however, the success of the imported technologies into recipient countries depends on different factors. According to a study by UNCTAD[1283], the effectiveness of imported foreign technologies such as, for example, imported seeds, plants, animals and machinery may be limited, for example, by the local adoptive capacity as well as agro-ecological conditions. In this vein, an effective TOT is conditional on the effective acquisition, adaptation, and adoption of the technology so transferred.[1284] Acquisition implies that, from a variety of sources available to them, countries should look for the most appropriate technological solutions. In this regard, those relevant technologies so identified should be tailored by the technology importing country in order to meet domestic needs during the technology adaptation process.[1285] This implies that even though some technological innovations can be adapted without undertaking modification, other innovations may require that a careful examination is conducted so as to assess their compatibility with local conditions.[1286] An important aspect when evaluating the adaptability of a given technological innovation relates to assessing the value of a given technology by weighing its benefits and costs. Such an evaluation will make the innovation suitable for adaption by the intended beneficiaries; such as small-scale farmers. Technological innovations which are imported into countries also have to be adopted appropriately. This means that the innovation should be successfully disseminated after undertaking careful

[1280] For instance, the import of capital goods is often associated with development, See, UNCTAD, Transfer of Technology and knowledge Sharing for Development, Science, technology and innovation issues for developing countries. This said, a core element of knowledge, tacit knowledge, which is responsible for their productive use, is mostly not transferrable through trade. See, UNCTAD, Current Studies on Science, Technology and Innovation, No. 8, (United Nations, New York and Geneva: 2014): 15-20.

[1281] UNCTAD, Transfer of Technology and knowledge sharing for development, Science, technology and innovation issues for developing countries; UNCTAD, Current Studies on Science, Technology and Innovation, 15-20.

[1282] Ibid, 3.

[1283] UNCTAD, Technology and Innovation Report, Enhancing Food Security in Africa Through Science, Technology and Innovation, UNCTAD/TIR/2009 (2010, United Nations, New York and Geneva): 85 ff.

[1284] Ibid.

[1285] Ibid.

[1286] Ibid. For instance, such evaluations may require appropriate standards are developed and maintained to ensure that accreditation is enforced in line with national policies on biodiversity, toxicity

evaluation.[1287] In this vein, it has been argued that even though there is a big technological gap between developing and developed countries, effective acquisition and diffusion of technology by developing countries can enable the latter to catch up swiftly.[1288]

The remaining discussion will be devoted to assessing how international trade has restrained the realization of the right to food by limiting the accessibility of the results of scientific progress to the public? It is important to bear in mind that even though the right to science) (Article 15(1)(b)) has not yet received a General Comment from the CESCR, as thoroughly discussed under chapter two, the analysis will be based on what legal experts, including the Special Rapporteur in the Field of Cultural Rights, Farida Shaheed, have provided in relation to the provision's scope, normative content and ensuing state obligations.[1289] In a 2013 report by the Special Rapporteur, "access" by everyone to, scientific knowledge, information, and advances, scientific information, as well as scientific applications and technologies, has been put as a pivotal element for the realization of the right to science.[1290]

The afore-discussed rules that guide international trade in agriculture, AOA, however, have not resulted in the effective TOT from developed countries to developing ones. This has been due to the fact that the right to science as incorporated under the ICESCR, has not been given due recognition with regard to agricultural trade. As implied above, one modality for the ITOT is trade in goods and services in general and specifically, for this analysis, trade in agricultural goods. Hence, it can be attested that trade in food commodities, constitutes a vital means by which to ensure the accessibility of scientific progress to the public. However, for trade to result in the effective TOT, along with the import of agricultural commodities, the technical as well as scientific know-how that went into the production of the commodities imported should also be transferred. This implies that aside from the import of agricultural commodities in the international market, an effective ITOT also connotes the transfer of skills, know-how, as well as the effective application by the technology recipient of the

[1287] Ibid. This kind of evaluation may include field trials, the availability of samples or subsidies to encourage uptake, and farmer-friendly finance. The successful dissemination of innovation may also be dependent upon other parties such as the private sector, agriculture research institutions, the private sector, farmers' groups, NGOs and civil society groups.

[1288] G. Grossman, and E. Helpman, Foreign investment with endogenous protection, National Bureau of Economic Research No. w4876. (1994); P.M. Romer, "The origins of endogenous growth", The Journal of Economic Perspectives, Vol 8. No. 1, (1994): 3-22; J. Eaton and S. Kortum, "Trade in ideas Patenting and productivity in the OECD", Journal of international Economics, Vol. 40. No.3, (1996): 251-278.

[1289] For more, see, Donders, "The Right to Enjoy the Benefits of Scientific Progress, 371; W.A. Schabas, "Study of the Right to Enjoy the Benefits of Scientific and Technological Progress and Its Applications", in Y. Donders and V. Volodin (eds), Human Rights in Education, Science and Culture: Legal Developments and Challenges, (Ashgate Aldershot: 2008): 273; C. Timmermann, "Sharing or Benefiting from Scientific Advancement?", Sci Eng Ethics, vol. 20, no 1. (2014):111; UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009), Report of the Special Rapporteur in the field of cultural rights Ms. Farida Shaheed on the right to enjoy the benefits of scientific progress and its applications, presented at the Twentieth Session of the Human Rights Council (14 May 2012) (A/ HRC/20/26). See also, Shaver, "The Right to Science", 411-430; Donders et al., "The Human Right to Enjoy the Benefits of the Progress of Science and Its Applications," 34-36.

[1290] Report of the Special Rapporteur in the field of cultural rights Ms. Farida Shaheed on the right to enjoy the benefits of scientific progress and its applications, presented at the Twentieth Session of the Human Rights Council (14 May 2012) (A/ HRC/20/26). Section B, Paragraph 29, Access is used to be inclusive of scientific knowledge, information and advances which must be made accessible to all without any discrimination.

knowledge so transferred, for instance, into the enhancement of national food production capability.[1291] More specifically, a salient aspect of ITOT involves the building of local capacity with the view to enable, for instance, local people, farmers, firms and governments to design and make technologies which can be put into the domestic economy.[1292] The ICESCR has also reiterated this aspect by stressing that the State Parties to the Covenant have the obligation to respect at the minimum, the right of everyone to be free from hunger by taking individually and through international cooperation measures "...needed to **improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge**" (Emphasis added).[1293] This provision of the ICESCR can be interpreted as implying the importance of international cooperation for the effective ITOT to enable LDCs and NFIDC, to access results of scientific progress so as to improve their systems of production, conservation as well as distribution. Notwithstanding the vitality of acquisition of scientific innovations, as noted, the appropriate adoption of an agricultural technology requires the development of institutional as well as scientific capacity in the recipient country. Even though the provision of domestic support by States (developing and developed alike) for this purpose is exempted from reduction commitments as per Annex 2 of the AOA, this remains to be an area of major challenge for developing countries as they lack the financial as well as technical capability to ensure support in this regard, further constraining the right to science.[1294] This is due to the fact that State funding on research and development has been dwindling in developing countries.[1295]

Moreover, the MS to the ICESCR are also under the obligation to take into account in their trade dealings the problems of food-importing developing countries so as to ascertain an equitable share of food supplies.[1296] Considering that the ineffective ITOT constitutes one of the "problems" prevalent in developing countries, due to for instance their inability to diversify their export sector, this obligation of the ICESCR can be interpreted to also be inclusive of the effective ITOT between developing and developed countries so that all countries stand to benefit from trade.

[1291] See, WTO, WT/WGTTT/M/51.

[1292] Martin Khor, "The Climate and Trade Relations: Some Issues", Research Paper 29 (2010).

[1293] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Article 11(2)(a). According to the provision, MS should take those measures which are needed to, "improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources".

[1294] See, V. W. Ruttan and Yujiro Hayami, Technology Transfer and Agricultural Development, Technology and Culture, Vol. 14, No. 2, (The Johns Hopkins University Press and the Society for the History of Technology 1973):119-151; UNCTD, Technology and Innovation Report 2010, Enhancing Food Security in Africa Through Science, Technology and Innovation.

[1295] See, McIntyre, et al., IAASTD, International assessment of agricultural knowledge, Science and Technology for Development (IAASTD): Global Report, 495ff. In about half of the 24 countries for which time series data were available, the public sector spent less on agricultural R&D in 2000 than 10 years earlier. This is because, most firms in SSA have few research staff with low total spending and they focus on crop improvement research, often export crops.

[1296] See, The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Article 11(2)(b).

More specifically, this implies, according to the Code of Conduct on the TOT, is that technology transfer transactions involving developing countries should take place in a manner which is balanced with a view to avoiding the possibility of abuse of power by stronger MS.[1297] As discussed afore, OECD countries - backed by their agribusiness MNCs - have used their strong position to influence the manner in which ITOT is being conducted. Nevertheless, the current structure of international trade in general and specifically in relation to trade in agriculture, as indicated above, is highly imbalanced due to the fact that developed countries have set the rules to be in their favor.[1298] Hence, this implies that ITOT has not resulted in mutual benefits mainly because making use of the ambiguities in the AOA, OECD countries (mainly U.S., EU, and Japan) have made sure that their interests are taken care of without necessarily having due regard to the implications such an endeavor will have on developing countries.[1299] In this vein, agricultural trade has not resulted in an increase in the participation of developing countries in world production and trade.[1300] Hence, this has created a source of dependence by developing countries on the import of foreign technology so as to support the agricultural sector because, for one, State expenditure on research and development has not been prioritized in government expenditure allocation.[1301] Moreover, a study conducted by AgEcon has disclosed that the absence of economic incentives to promote local innovations for scientist in LDCs as another reason behind the lag in agricultural research and development.[1302] As such, even though the Marrakesh Decision deals, as already noted, with the importance of financial and technical assistance provision to LDCs and NFIDCs, the fact that the Decision has not created any legally binding obligations, have weakened its impact.

As noted, rather than enhancing the participation of developing countries in world production, the manner in which the ITOT is currently being conducted has further restrained the participation of developing countries. The reason behind this has to do with, firstly, developing country exports have not been able to enter the high value-added markets of developed countries that easily due to the imposition of high rates of tariffs on agricultural commodities, as opposed to the manufacturing sector, coming from the global South.[1303] Moreover, the agricultural goods that enter these markets are concentrated on non-fuel primary products whereas processing is carried out abroad (tariff escalation)[1304] by

[1297] See UNCTAD, "Draft International Code of Conduct on the Transfer of Technology as of 5 June 1985" (TD/CODE/Technology Transfer/47, 1985): Article 2(1).
[1298] See, for example, Jennifer Clapp, Food Security and Contested Agricultural Trade Norms, Journal of International Law and International Relations, Vol. 11, No. 2. (2015).
[1299] Clapp, Food Security and Contested Agricultural Trade Norms; Clapp, Food.
[1300] See, Clapp, Food.
[1301] Jimmye Hillman & Eric Monke, International Transfer of Agricultural Technology, *EconPapers*. (1982).
[1302] Ibid.
[1303] For more, see, OECD, The Uruguay Round Agreement on Agriculture: An Evaluation of its Implementation in OECD Countries; Anderson& Will, Agricultural Trade Reform and The Doha Development Agenda. The tariff rates for some agricultural commodities in OECD countries exceed 500%.
[1304] FAO, The State of Food and Agriculture: Agricultural Trade and Poverty Can Trade Work for the Poor?, 41 42. Tariff escalation takes place when the level of import tariffs increases corresponding with the degree of processing on commodities.

Agribusiness MNCs hence exposing exports to high tariff.[1305] Additionally, the AOA infringes the right to science due to the fact that the provision of technical assistance for developing countries (NFIDC and LDCs among them)[1306] to be able to bolster their export sectors which are for the most part focused on primary agricultural goods, is absent. For this reason, they have been forced to rely on the subsidized provision of food imports. This trend infringes the effective TOT because a fundamental element for the realization of the right to food, freedom from hunger[1307], involves as already highlighted, the taking of those measures so as to develop methods of production, conservation and distribution of food through the utilization of technical and scientific knowledge.[1308] Hence, the agreement has not enabled developing countries to enter the high value-added markets of developed countries. This is notwithstanding the Marrakesh Decision, which has asked MS to take into consideration in their food aid programmes, "**the provision of technical and financial assistance to least-developed and net food-importing developing countries** to improve their agricultural productivity and infrastructure" (Emphasis added).[1309] In spite of the recognition of the need for the ITOT to NFIDC and LDCs, the Marrakesh Decision suffers from, as noted, the lack of monitoring mechanisms so as to assess the effect that has resulted from the reform programme under the AOA on NFIDCs.[1310] Additionally, the Decision moreover is weakened by the fact that it has not created any binding obligations which has limited its impact.[1311] For this reason, the conduct of agricultural trade under the AOA has not resulted in the transfer of technical as well as scientific knowledge to developing countries. This further snatches an avenue for increased participation in production and trade for developing countries and as a result, infringes the "right to science". This said, however, in the Doha Round negotiations, even though not concluded until now, concerns have been raised as regards the provision of technical and financial assistance. For now, however, it remains unclear to what extent the negotiations will yield results in this regard due to ensuing disagreements.

[1305] FAO, Symposium on Agriculture, Trade and Food Security, 127; UNDP, Human Development Report, International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World, 127. For example, as a result of tariff escalation, countries such as Côte d'Ivoire and Ghana have been pushed into the export of unprocessed cocoa beans as such forcing them to serve the volatile, low value-added raw cocoa market. On the contrary however, this has left Germany and European companies, the world's largest exporter of processed cocoa, to capture the bulk of the final value of Africa's cocoa production.

[1306] See, for example, Marrakesh Decision: Paragraph 3(iii).

[1307] According to General Comment, 12, Every State is obliged to ensure for everyone under its jurisdiction access to the minimum essential food which is sufficient, nutritionally adequate and safe, to ensure their freedom from hunger, see, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 14.

[1308] See, Article 11(2)(a) of the International Covenant on Economic, Social and Cultural Rights, UN General Assembly, International Covenant on Economic, Social and Cultural Rights, (16 December 1966).

[1309] Marrakesh Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries, Decisions adopted by the Trade Negotiations Committee on 15 December 1993 and 14 April 1994. See also, AOA: Preamble.

[1310] See, Schutter, International Trade in Agriculture and the Right to Food, Dialogue on Globalization; UNCTAD, Impact of the Reform Process in Agriculture on LDCs and Net Food-Importing Developing Countries and Ways to Address Their Concerns in Multilateral Trade Negotiations.

[1311] For more, see, Schutter, International Trade in Agriculture and the Right to Food, Dialogue on Globalization; Hunter, "Broken Promises: Trade, Agriculture and Development in the WTO". This is with the exception of the provisions relating to food aid and concessionality which have produced actual results.

Aside from this, the AOA has not hastened the ITOT to developing countries due to other factors. The reason behind has to do with the fact that there is marked influence which is being exerted by agricultural commodity traders, food processors and global retailers in the international agricultural market (constituting the global supply-chain).[1312] As a result of this, the global supply-chain has come to occupy a dominant position in international trade as a result of concentration at different segments.[1313] In this regard, the opening up of markets in developing countries earlier as a result of SAPs and since 1994, because of the AOA, has seen increased participation of MNCs in the global supply-chain. Their dominance has grown upto influencing governments, among other things, to establish trade and investment rules that work in their favor.[1314] Moreover, the concentration in the global supply-chain in agricultural[1315] means that they impose their price on producers and set standards which small-scale farmers in developing countries are unable to meet forcing them to concentrate on the low-level domestic market.[1316] This said a large value of agricultural products goes to the large agribusiness MNCs - mainly commodity buyers, processors, and retailers.[1317] In this regard, the fact that the large commodity buyers are based in the OECD countries limits the portion of the value that goes to developing countries.[1318] In the light of this, even though agribusiness MNCs can play an important function in connecting agricultural producers in developing countries, for example, with the high-value market in OECD countries, their buying policies have resulted in segmentation in the farming sector.[1319] This is because, the MNCs have the power to determine which producers will have access to the high-value markets and can get access to the best technologies, agricultural inputs, credit, as well as political influence.[1320] In this regard, through the acquisition of land in developing counties agribusiness MNCs have entered into contracts with those farmers that have come to engage in large-scale industrial production of crops such as soy, sugar, and oil palm.[1321]

[1312] See, Clapp, Food, 90 ff.

[1313] Ibid. The top four trading firms, Archer Daniels Midland (ADM), Bunge, Cargill, and Louis Dreyfus (known in the industry as ABCD), control close to 75-90 percent of the world trade in grains and oilseeds, mainly corn, soy, and wheat. See also, Murphy, 'Concentrated Market Power and Agricultural Trade'; Jennifer Clapp, "ABCD and beyond: From grain merchants to agricultural value chain managers", Vol. 2, No. 2, (Canadian Food Studies, 2015).

[1314] See also, Murphy, "'Concentrated Market Power and Agricultural Trade'"; Clapp, "ABCD and beyond: From grain merchants to agricultural value chain managers".

[1315] Ibid; IAAKSTD, Executive Summary, 6; World Bank, World Development Report 2008: Agriculture for Development. Moreover, agribusiness MNCs exert influence on price and private standard setting as well as through government lobbying.

[1316] See, Murphy, "'Concentrated Market Power and Agricultural Trade'"; Clapp, "ABCD and beyond: From grain merchants to agricultural value chain managers".

[1317] Schutter, Agricultural Trade and the Right to Food, Dialogue on Globalization, 29-33; Clapp, "ABCD and beyond: From grain merchants to agricultural value chain managers". For example, Cargill, the largest grain trading firm has recorded revenues of over US$136 billion in 2013 while its work force accounted for 142,000 at the same time. The Special Rapporteur on the right to food, Olivier De Schutter, gives an example of the impact concentration of the global supply- chain has had on the share of the retail price that goes for coffee producing countries, such as, Brazil, Colombia, Indonesia, and Vietnam which has declined from 64 percent of global production in the 1990s to 10 percent in 2002 while that which went to the value-chain has doubled.

[1318] Clapp, Food, 90ff; Schutter, Agricultural Trade and the Right to Food. An increasing portion of the end value of agricultural products goes to the large transnational corporations in the agrifood system.

[1319] Schutter, Agricultural Trade and the Right to Food, Dialogue on Globalization, 29-33.

[1320] Ibid.

[1321] See, Oxfam, Smallholders at Risk, (Oxfam, Oxford, UK: 2014).

Hence, concentration in the agricultural supply-chain has restrained the right to benefit from science by hampering the effective TOT to those in need; developing countries. This implies that the international trade rules in general and those specific to agriculture under the AOA, that call for, as already discussed, the liberalization of agricultural trade through the elimination trade barriers, support these objectives, at the expense of the producer as they have been set to be in line with their preferences.[1322] This is due to the fact that agribusiness MNCs fund lobby groups to influence government officials in trade negotiations, lobby in their own right while at the same time they are present as part of national delegations in many countries.[1323] In a similar vein, even though the farm sectors in the U.S and EU account for only a small share of the respective GDP in these countries, farm groups exert considerable influence hence empowering them to influence in the respective domestic political systems.[1324]

Thus, this implies that agribusiness MNCs wield immense power in exerting their influence on the rules of the game in trade despite the fact that the rules are not in favor of consumers and farmers in developing countries.[1325] The implication of this has been that they highly influence how ITOT is conducted notwithstanding the fact that concentrated market power of agribusiness MNCs in international agricultural trade, has not been taken into account into the models as well as assumptions in the trade and agriculture debate.[1326] As a result of this concentration of agribusiness MNCs in the food supply-chain, the rules in trade in agricultural have not given due recognition to the right of everyone to have access to scientific knowledge, information, and advances, as well as scientific applications and technologies.[1327]

Thus, the right to benefit from science (Article 15(1)(b) of the ICESCR, has not been made an integral part of the international rules that guide trade in agriculture. This has been due to the fact that even though trade is expected to be an avenue for the ITOT, the rules that are operational in this regard - AOA - have not given due recognition to the ITOT from developed to developing countries. This has been because the provision of financial and technical assistance - although made an integral part of the Marrakesh Decision - has not been implemented effectively.[1328] Moreover, agribusiness MNC's at different levels, have been exerting immense influence - through government lobbying for instance - so as to guarantee the rules are to their liking and their benefits are ensured in the trade transactions. Consequently, developing countries have been incapacitated in receiving needed TOT in

[1322] Murphy, Concentrated Market Power and Agricultural Trade, 27ff.
[1323] Ibid. For instance, it was the former Vice-President of Cargill, Dan Amstutz, who drafted the original AOA text, while he was serving as a member of the U.S. trade representative's office.
[1324] See, Clapp, Food.
[1325] Ibid.
[1326] Ibid; Murphy, Concentrated Market Power and Agricultural Trade; Sofia Murphy, WTO Agreement on Agriculture: Suitable Model for a Global Food System, Foreign Policy in Focus, (2005).
[1327] Report of the Special Rapporteur in the field of cultural rights Ms. Farida Shaheed on the Right to Enjoy the Benefits of Scientific Progress and its Applications, presented at the Twentieth Session of the Human Rights Council (2012) (A/ HRC/20/26): Paragraphs 26, 27 & 28.
[1328] See, Schutter, International Trade in Agriculture and the Right to Food, Dialogue on Globalization; UNCTAD, Impact of the Reform Process in Agriculture on LDCs and Net Food-Importing Developing Countries and Ways to Address Their Concerns in Multilateral Trade Negotiations.

technical and financial. It remains to be seen what the Doha Round negotiations will bring about, as the Ministerial meetings have thus far been inconclusive.

Chapter 4: Intellectual Property Rights and the Right to Food

4.1. Introduction

As already examined elaborately under chapter two of the research, as an internationally recognized human right, the right to food has been enshrined with binding legal effect under Article 11 of the ICESCR.[1329] As noted, similar to other economic, social and cultural rights as contained in the Covenant, the provision puts obligations on State Parties to the Covenant to respect, protect and fulfill the right to food.[1330] However, among other reasons, the full realization of this right has lagged behind because of the expansion of IPRs in the agricultural sector, especially since the 1980s.[1331] The underlying reason for this is related to the fact that since the coming into force of the TRIPS agreement in 1995[1332], agribusiness MNCs have increasingly been seeking Patent protection for their plant-related inventions.[1333] This means that, as per the TRIPS Agreement, they are granted exclusive rights by which they are authorized to exclude third parties, *inter alia*, farmers from using, selling or importing the invention so protected.[1334] The introduction of Patent protection into a sphere so vital to life, food production has, however, raised mounting concern especially from developing country members, of the WTO.[1335]

This said, however, prior to the coming into effect of the TRIPS Agreement, in Europe (originating in economically advanced countries of Western Europe)[1336], a system of protection has already been developed as back as 1962. This alternative system is known as the International Union for the Protection of New Varieties of Plants (UPOV).[1337] The UPOV seeks to protect plant breeders' that have made improvements in plants by granting Plant Variety Protection (PVP) for their novel varieties.

A close assessment into both regimes for Plant Variety Protection, however, reveals that they have restrained States' ability to protect, promote and fulfill their obligation related to the

[1329] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999); United Nations General Assembly, Universal Declaration of Human Rights, (December 10, 1948): Article 25.
[1330] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 15.
[1331] See, Craig Borowiak, "Farmers' Rights: Intellectual Property Regimes and the Struggle over Seeds", Politics & Society, Vol. 32, No. 4, (December 2004): 511-543, DOI: 10.1177/0032329204269979.
[1332] Before the adoption and subsequent entry into force of the TRIPS agreement, intellectual property protection did not apply to plants. This was because, IPRs "pertained solely to commercial production of nonliving beings, principally mechanical inventions such as special hoisting gear for barges and processes for making stained glass". See, Borowiak, "Farmers' Rights", 511-543.
[1333] Ibid.
[1334] See, Agreement on Trade-Related Aspects of Intellectual Property Rights, (1 January 1995): Article 28.
[1335] For instance, leading up to accession to TRIPS, such concerns were particularly visible in countries such as India, Thailand, the Philippines, Brazil. See, Borowiak, "Farmers' Rights", 511-543; Pedro Roffe, "Bringing Minimum Global Intellectual Property Standards into Agriculture: The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), in The Future Control Food: A Guide to International Negotiations Rules to and on Intellectual Property, Biodiversity Food Security", (Geoff Tansey and Tasmin Rajotte eds., 2008, (London, Earthscan):48-67; Lauren Winter, "Cultivating Farmers' Rights: Reconciling Food Security, Indigenous Agriculture, and TRIPS", Vanderbilt Journal of Transnational Law, Vol. 43:223, (2010).
[1336] See for example, Borowiak, "Farmers' Rights", 511-543.
[1337] See, International Convention for the Protection of New Varieties of Plants 2 December 1961, (revised 19 March, 1991).

right to food. This means that IPRs protection given to plant-related innovations have resulted in putting restrictions over the results of scientific innovations to the public. The reason behind is due to the fact that under the terms of protection, as stipulated under both regimes, the exclusive rights granted to inventors/plant breeders bestows upon them the right to control the uses of the invention in question by excluding it from the ambit of the public.

IPRs protection in plants besides directly constraining the right to food has simultaneously put limits on the right to science as incorporated under Article 15(1)(b) 0f the ICESCR.[1338] As elaboratly discussed in chapter two, the reason behind has to do with the fact that access to results of innovations to everyone appears to constitute an integral component for the realization of this right. Even though this right has not received a General Comment, experts have indicated that accessibility[1339] to results of scientific endeavors constitutes the main content of the right to science. As such, the proliferation of IPRs protection in plants has put restrictions on State's ability to realize the right to food. Parallel to this, IPRs protection in plants has put limits on the right to science hence further impeding on the realization of the right to food.

Therefore, based on these considerations, the chapter aims at giving an answer to the research question: how is the realization of the right to food being hampered by the international IPRs regime? In order to answer to the quest at hand, the chapter explores how the TRIPS rules tighten the progressive realization of the right to food. Moreover, the chapter assesses how the right of people to have access to the results of scientific innovations is at the same being restrained**.** In order to meet the quest at hand, the chapter is structured in the following way. The first section synopsizes the nature of rights and obligation enshrined under the TRIPs Agreement dealing with IP protection. With a specific focus on Patent, the second section will look at options that are available for Member States of the WTO to provide protection to plant varieties. The third part of the chapter explores the UPOV convention so as to uncover the rights and obligations it entails. In the subsequent section, two Acts of the UPOV Convention (1978 and 1991) are compared. Having compared the two Acts, the next section is devoted to an assessment of the flexibilities as provided under the TRIPS Agreement with the view to scrutinize the extent to which they can be relied upon by Member States to realize the right to food. With the aim of exploring an answer to the research question raised, the next two sections analyze how the full enjoyment of the right to food is tightened by Patent and sui generis system of plant variety protection.

[1338] See, The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights", (1966): Article. 15(1)(b).

[1339] See, Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012); UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009): Paragraph 13(C); See, Claude Richard Pierre, Scientists' Rights and the Human Right to the Benefits of Science, In "Core Obligations: Building a Framework for Economic, Social and Cultural Rights". edited by Capman R. Audrey and Russell Sage. (Intersentia, Antwerp and Oxford, 2002b): 247–278.

4. 2. The TRIPS Provision on Patent: An Overview

The Uruguay Round of Negotiations were held from 1986-1994 under the auspices of the GATT.[1340] After conducting extensive negotiations, the participating countries concluded the negotiations round by adopting the Marrakesh Agreement Establishing the World Trade Organization (the Agreement Establishing the World Trade Organization) in Marrakesh, Morocco.[1341] Thus the WTO was established in April 1994 by the Agreement Establishing WTO or as it is commonly called Marrakesh Agreement.[1342] The Marrakesh Agreement, which came in to effect as of 01 January 1995 consists of four different annexes[1343] dealing with a plethora of issues, *inter alia*, Dispute Settlement Understanding, Trade Policy Review Mechanism. As an integral part of the agreement, the WTO members have negotiated and adopted Annex 1C, which deals with the TRIPS agreement.[1344] Annex 1C the (TRIPS Agreement) has enshrined a number of substantive rights as well as obligations that require adherence by members to the rules of the agreement.

As such, the TRIPs Agreement, which came into force in 1995 with 128 original members, has set minimum global standards in Intellectual Property protection (hereafter IPRs).[1345] A minimum level of protection that must be respected by WTO countries has been adopted.[1346] To this effect, the agreement has since then obliged both developing and developed members of the WTO to adopt such minimum standards of IPRs protection into their national legal system.[1347] Particularly, the agreement obliges members to adopt wide-ranging minimum standards of intellectual property protection in a number of areas, including copyright, trademarks, patents, industrial designs, trade secrets, and many other areas.[1348]

As regards Patent, Article 27 provides a number of rights and obligations that range from patentable subject matter to some of the grounds for the exclusion from patentability.[1349] As a case in point, it is incognizant of the minimum level of protection enshrined that the

[1340] Charles Clift, "Why IPR issues were brought to GATT: a historical perspective on the origins of TRIPS", In Research Handbook on the Protection of Intellectual Property under WTO Rules: Intellectual Property in the WTO, Vol. I, (Carlos M. Correa ed.,) (Edward Elgar, UK & USA: 2010):11.
[1341] See, WTO Agreement, Marrakesh Agreement Establishing the World Trade Organization, (April 15, 1994).
[1342] Ermias Tekeste Biadgelegn, "Accession to the WTO, Intellectual Property Rights and Domestic Institutions," In Research Handbook On the Interpretation and Enforcement of Intellectual Property Under WTO Rules: Intellectual Property in the WTO, Vol. II, (Carlos M. Correa, ed.) (Edward Elgar, UK & USA: 2010):80.
[1343] For more, see, DSU, Dispute Settlement Rules: Understanding on Rules and Procedures Governing the Settlement of Disputes, Marrakesh Agreement Establishing the World Trade Organization, Annex 2, (1994); GATT 1994: General Agreement on Tariffs and Trade 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, (April 15, 1994).
[1344] See, Agreement on Trade-Related Aspects of Intellectual Property Rights, (April 15, 1994).
[1345] C. Deere, The Implementation Game: The TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries, (Oxford University Press, 2008); Biadgelegn, "Accession to the WTO, intellectual property rights and domestic institutions," 82.
[1346] Laurence R. Helfer, "Intellectual property rights in plant varieties: International legal regimes and policy options for national governments", FAO Legislative Study 85, Food and Agricultural Organization of the United Nations, Rome; Italy: 2004): 33; The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 1.
[1347] J.H. Reichman, "Universal Minimum Standards of Intellectual Property Protection under the TRIPS Component of the WTO Agreement", Int'l Law (1995): 345 &345.
[1348] C. Deere, The Implementation Game: The TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries, (Oxford University Press, 2008).
[1349] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27.

agreement provides protection to plant varieties under Article 27(3)(b).[1350] The paragraph of the provision, specifically, deals with the obligation of Member States to provide protection to plant varieties, however, without providing specific definitions of the issues covered therein. However, prior to looking at the normative content of the said paragraph of the provision and how it restrains the realization of the right to food as well as the right to science, it is worthwhile to concisely go through the overall contents of the provision (Article 27).

Article 27 of the TRIPS Agreement under the heading of "Patentable Subject Matter" underscores patentable subject matters in general. Particularly, paragraph one of the provision (Article 27(1)) stipulates that,

> "Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. Subject to paragraph 4 of Article 65, paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced".[1351]

A close scrutiny into the paragraph demonstrates patentable subject matters and the criteria, which innovators are required to fulfill, in order to get protection from a particular Member State to the WTO. Accordingly, the paragraph obliges members to provide Patent protection for any inventions in all fields of technology.[1352] Under this context, it requires countries to provide Patent protection to "any invention" whether the invention in question is a product or a process.[1353] While product Patent enables the patentee to "make, use and import" the patented product, process Patent protection grants exclusive right not only over the use of the product but also over products acquired via a patented process. [1354]

In this regard, while patent should be available for any inventions in all fields of technology, a particular invention should meet certain criteria in order to fall within the scope of the legal protection. To this effect, the paragraph provides that "...patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application...".[1355] Despite underscoring the criteria for patentability, the provision has not, however, clarified the meaning of each of the criteria integrated under the provision.[1356] However, in footnote 5 to Article 27(1), it "allows" WTO countries to interpret "inventive step" as identical to "non-

[1350] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27 (3) (b).
[1351] Ibid. Article 27(1).
[1352] Carlos M. Correa, "Implementing the TRIPS Agreement in the Patents Field Options for Developing Countries," The Journal of World Intellectual Property, (1998):75&76; The United Nations Conference on Trade and Development (UNCTAD), "World Trade Organization: TRIPS," Prepared by F. Abbott, (2003):20.
[1353] Kevin W. McCabe, "The January 1999 Review of Article 27 of the TRIPS Agreement: Diverging Views of Developed and Developing Countries Toward the Patentability of Biotechnology," Journal of Intellectual Property Law 6, No. (October 1998):50.
[1354] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 28(b).
[1355] Ibid, Article 27(1).
[1356] Correa, "Implementing the TRIPS Agreement in the Patents Field Options for Developing Countries," 5&76.

obvious", and a member may also deem that "capable of industrial application" is synonymous with "useful".[1357] Despite the lack of clarity as to the underlying meaning of each of the criterion, it can be inferred from the exceeding analysis that an application to be made for Patent protection must fulfill the criteria of novelty, inventive step and industrial applicability. Provided that the aforesaid criteria are met, Member States are bound to provide Patent protection unless protections are excluded on the basis of Article 27(2,3) of the agreement.

While Article 27(1) of the provision deals with patentable subject matters, paragraph two and three provide some of the exclusions to such patentability. In this context, paragraph two of Article 27 sets out that,

> "Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect ordre public or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law".

As the foregoing section demonstrates, even though WTO members have an obligation to provide Patent to any inventions in all fields of technology (Article 27(1)), the second paragraph provides, however, that certain inventions can be excluded from the scope of patentability.[1358] Simply put, according to Article 27(2), there are certain permissible exclusions to the patentability criteria embodied in article 27(1). As such, countries have the right to disregard the provision of Patent protection for an invention that is at odds with "ordre public or morality**,** including to protect human, animal or plant life or health or to avoid serious prejudice to the environment".[1359] In connection to this, even though the provision has not considerably insinuated as to the contents of the grounds of exclusion, members have the right to determine and exclude from patentability such inventions provided that the commercialization of such inventions is perilous to animals, plants, health, environment and the like.[1360]

In addition to the exclusivity given in Article 27(2), paragraph three of the provision consists of two further exclusions to the rights enshrined in Article 27(1). Setting aside the discussion in relation to Article 27(3)(b) (the main focus of this chapter), the discussion below focuses on one of the exclusions included in Article 27(3) of agreement. In this regard, Article 27(3)(a) of the agreement entrusts members with the right to exclude "diagnostic, therapeutic and surgical methods for the treatment of humans or animals" from the scope of patentability enshrined in Article 27(1). As indicated above, in order for an invention to get Patent

[1357] See, Footnote 5 to article 27(1). See also, Correa, "Implementing the TRIPS Agreement in the Patents Field Options for Developing Countries," 82.
[1358] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(2); McCabe, "The January 1999 Review of Article 27 of the TRIPS Agreement," 50.
[1359] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(2); Richard Elliott and Marie-Hélène Bonin, "Patents, International Trade Law and Access to Essential Medicines," Canadian HIV/AIDS Legal Network & Médecins Sans Frontières Canada (2002):5.
[1360] The United Nations Conference on Trade and Development (UNCTAD), "World Trade Organization: TRIPS," Prepared by F. Abbott, (2003):20.
[1360] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(1).

protection, it must fulfill the criteria highlighted under Article 27(1). Particularly, an innovation that is capable of industrial application is subject to Patent protection. It is in recognition of this requirement that "therapeutic, surgical and diagnostic methods produce effects on the human body or animal" are excluded from the scope of patentability as they fail to meet the requirement of industrial applicability.[1361] This entails that despite an argument to the contrary, the said methods fail to meet the industrial applicability requirement as enshrined under article 27(1) of the TRIPS Agreement.

Having explored the general content of article 27 of TRIPS, the next section explores the normative contents of article 27(3)(b) in order to lay a foundation for the right to food, which is the main focus of this research.

[1361] See, The United Nations Conference on Trade and Development (UNCTAD), "Chapter 20: Patents: Therapeutic, Surgical and Diagnostic Methods," UNCTAD, (November 27, 2004):384.

4.3. The TRIPS Agreement: The Protection of Plant Varieties

4.3.1. Patent Protection for Plant Variety

As the preceding section has indicated, Article 27(1) of TRIPS sets forth an obligation which entails that the WTO Member States must provide Patent to any invention in all fields of technology provided that the invention in question meets the eligibility criteria.[1362] As a limitation to the right granted to Patent holders, paragraph two, however, provides exceptions to such exclusive right given to Patent holders. Besides the exception embodied in paragraph two, paragraph three of the provision provides further exceptions to the principle enshrined in Article 27(1). Given the fact that one of these exceptions has already been the subject to analysis under the preceding section, the chapter under this part focuses on the remaining exception as enshrined in Article 27(3)(b) of the agreement, hence, establishing a foundation for the subsequent analysis in relation to the right to food.

As highlighted earlier, the TRIPS Agreement remains the only international treaty which sets minimum international IP standards in various fields, *inter alia*, Patent, plants varieties[1363] , and many others.[1364] This implies that members are required to adopt the minimum level of protection in their national legal system as regards the IPRs forms integrated in the TRIPS Agreement[1365] With regard to plant variety, a core provision which directly relates to the focus of this chapter is embedded in Article 27 (3)(b) of the agreement. The paragraph (Article 27(3)(b)) stipulates that WTO countries may exclude from patentability,

> "plants and animals other than micro-organisms, and essentially biological processes or the production of plants or animals other than non-biological and microbiological processes[1366]

When the elements integrated into the paragraph (Article 27(3)(b)) are closely looked at, one may grasp that aside from the exclusions allowed under Article 27(2) and (3)(a) of the agreement, members have the right to exclude plants and animals from the sphere of patentability.[1367] This exclusion, however, is subject to another exception in that the agreement obligates countries to provide for the protection of a plant variety regardless of the members right to exclude plants and animals from the scope of patentability.[1368] It specifically stipulates that "members shall provide for the protection of plant varieties either by Patents or

[1362] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(1).
[1363] Lauren Winter, "Cultivating Farmers' Rights: Reconciling Food Security, Indigenous Agriculture, and TRIPS," Vanderbilt Journal of Transnational Law 43, (2010):234.
[1364] David S. Tilford, "Saving the Blueprints: The International Legal Regime for Plant Genetic Resources," Case W. Res. J. Int'l Law 30, (1998):409.
[1365] See, Winter, "Cultivating Farmers' Rights," 233&234.
[1366] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(30(b) of the TRIPS.
[1367] See, J. Benjamin Bai, "Protecting Plant Varieties under TRIPS and NAFTA: Should Utility Patents Be Available for Plants?," Texas International Law Journal, (1997):141&142.
[1368] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(3)(b). However, the absence of definition in the TRIPS agreement has meant that countries can interpret the exclusion of plant patent protection broadly to include also plant varieties. See, Carlos M. Correa, "TRIPS-Related Patent Flexibilities and Food Security Options for Developing Countries", International Center for Trade and Sustainable Development, (2012):5.

by an effective *sui generis* system or by any combination thereof."[1369] This entails that despite the exclusion allowed under the provision (Article 27(2&3)), the protection of plant varieties is an obligation that must be discharged by the Member States of the agreement.[1370] As such, Article 27(3)(b) requires WTO countries to protect plant varieties by Patent or an effective *sui generis* system of protection or by a combination of the two systems.[1371] The phrase, "patent or *sui generis* or any combination thereof", specifically, implies that a member may even exclude plant varieties from the scope of patentability. However, if a member excludes plant varieties from the ambit of patentability, that particular member is duty bound to provide protection through an alternative, effective *sui generis*, system of protection.[1372] This entails that it is up to a country to choose which of the three modalities to adopt in their national legal system so as to fully implement obligations enshrined in Article 27(3)(b) of TRIPS.

In this context, it is essential to note that even though the provision (Article 27(3)(b)) consists of three (Patent, *Sui generis* or any combination of both system) modalities of implementing the obligation as regards the protection of plant varieties, the procedures integrated have mainly been a result of lack of consensus between developed and developing countries during the TRIPS negotiation process.[1373] In this regard, from the standpoint of developed nations, there has been divergence as to which mode of protection to put in place for plant varieties. As a case in point, while countries such as the U.S., Japan, and Australia have had experience with the patenting of plant varieties, European countries have provided a different form of protection (a *sui generis* system for plant breeders).[1374] This legal protection existed in Europe since the 1920s although its international significance became more pronounced with the adoption of the International Union for the Protection of New Varieties of Plants (UPOV) since 1961.[1375] Therefore, even though as a consequence of lack of consensus, three alternative methods (Patent, *sui generis* or any combination of the two) have been put in place, the provision (Article 27(3)(b)) has not, however, clarified as to the underlying meaning of an "effective *sui generis*" system of protection that can be of help for members to

[1369] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(3)(b).
[1370] See, Michael Blakeney, "Patents and Plant Breeding: Implications for Food Security," Amsterdam Law Forum 3, (2011):73.
[1371] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27 (3) (a & b); Regine Andersen, "Norway says 'no' to UPOV '91 on plant Breeders' rights," BIO-IPR, (7 December 2005). Available at: https://www.grain.org/article/entries/2183-norway-says-no-to-upov-1991, accessed on 11 February, 2018.
[1372] McCabe, "The January 1999 Review of Article 27 of the TRIPS Agreement," 51. Bai, "Protecting Plant Varieties under TRIPS and NAFTA," 140; Tilford, "Saving the Blueprints," 408.
[1373] Mercedes Campi and Alessandro Nuvolari, "Intellectual property protection in plant varieties: A worldwide index (1961–2011)," Research Policy 44, (2015):953; Florian Leverve et al., "Exploring the flexibilities of TRIPS to promote biotechnology in developing countries," in Research Handbook on the Protection of Intellectual Property under WTO Rules: Intellectual Property in the WTO, Vol. I, (Edward Elgar, UK and USA: 2010):573.
[1374] UNICTAD-ICTSD, "Project on IPR and Sustainable Development: Resource Book on TRIPS and Development", (Cambridge University Press, 2005):394; Campi and Nuvolari, "Intellectual property protection in plant varieties: A worldwide Index (1961–2011)," 953.
[1375] See, International Convention for the Protection of New Varieties of Plants, December 2, 1961, (revised in 1972, 1978, and 1991).

implement their obligation as regards plant varieties.[1376] This means the agreement does not provide for what an "effective *sui generis*" system constitutes leaving it open for interpretation by national authorities.[1377] From a cross-reference to scholarly works, however, this requirement could be interpreted as implying "a system that **contains implementation of judicial and/or administrative procedure for plant variety protection** holders to execute their rights" (Emphasis added).[1378] In this context, a report prepared by Leskien & Flitner in 1997, has provided four criteria for an "effective *sui generis* system" that any national plant variety protection law must incorporate in order to be in line with the requirement of the Agreement.[1379] Primarily, it articulates that in order for a law of a country to be in conformity with the TRIPS provision (Article 27(3)(b)), that particular law must provide protection to all plant varieties in all species and botanical genera.[1380] Secondly, the *sui generis* system of protection to be adopted by members should be tantamount to IPRs protection, meaning that plant breeders[1381] must be given an exclusive right to control particular acts with respect to those protected varieties, or at a minimum, the right of remuneration when third parties engage in certain acts that infringe the rights of breeders.[1382] Thirdly, for a national *sui generis* system to be in conformity with TRIPS, it must be based on the principle of non-discrimination (or National Treatment and Most Favored Nations treatment) as it should provide equal treatment to breeders from all WTO Members.[1383] Aside from the aforesaid conditions, a national *sui generis* system of plant variety protection should contain procedures that enable breeders to enforce the rights granted to them under such a law.[1384] Even though some scholars provide such elucidation, it is evident that except scholarly works, the TRIPS provision does not, insinuate as to the meaning of "effective *sui generis*" system of protection to be given to plant variety.

In spite of lack of clarity, existing trend, however, demonstrates that members are impliedly required to join the 1991 Act of the International Convention for the Protection of New Varieties Plants[1385] so as to fully comply with their obligation to provide protection to plant

[1376] See, Leskien, Dan and Michael Flitner. "Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System," Issues in Genetic Resources, No. 6 (June 1997):26ff; McCabe, "The January 1999 Review of Article 27 of the TRIPS Agreement," 11.
[1377] The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 1(1); McCabe, "The January 1999 Review of Article 27 of the TRIPS Agreement," 11.
[1378] Savita Muppapudi, "Towards a Balanced Sui Generis Plant Variety Regime: Guidelines to Establish a National PVP Law and an Understanding of TRIPS-Plus Aspects of Plant Rights", (United Nations Development Program, 2008): 5; H.M. Haugen et al, "Food Security and Intellectual Property Rights: Finding the Linkages", In Intellectual Property and Human Development: Current Trends and Future Scenarios, (T. Wong & G. Dutfield, eds.), (2011): 120.
[1379] Dan and Flitner, "Intellectual Property Rights and Plant Genetic Resources," 26ff.
[1380] Ibid.
[1381] See, International Convention for the Protection of New Varieties of Plants 2 December 1961, (revised 19 Mar. 1991): Article I(iv). A plant breeder refers to "a person who bred, or discovered and developed, a variety".
[1382] Dan and Flitner, "Intellectual Property Rights and Plant Genetic Resources," 26ff.
[1383] The treatments were part of the General Agreement on Trade and Tariff (GATT) and imported to the TRIPS Agreement as a result of the Uruguay Round of Negotiations., For more, see General Agreement on Tariffs and Trade, (October 30, 1947): Article 3.
[1384] Dan and Flitner, "Intellectual Property Rights and Plant Genetic Resources," 26.
[1385] See, International Convention for the Protection of New Varieties of Plants 2 December 1961, (revised 19 Mar. 1991).

varieties through the *sui generis* system as enshrined in the TRIPS Agreement.[1386] This is part of an argument that the UPOV Agreement is being considered the most appropriate *sui generis* system already in place to protect plant variety as envisioned in Article 27 of the TRIPS Agreement.[1387] It is due to the same reasoning that the UPOV has seen a proliferation in its membership following the coming into effect of the TRIPS Agreement.[1388] While an in-depth analysis with regard to the UPOV Agreement will be provided subsequently, the section below will uncover one of the modalities for the protection of plant varieties as embodied in Article 27(3)(b) of the TRIPS Agreement.

From the preceding section of this chapter, it is evident that a member which opts for a Patent system has an obligation to provide Patent protection to a plant variety.[1389] In this sense, although the TRIPS provision (Article 27(3)(b), obliges members to provide such protection to plant varieties, the provision fails to define as regards what constitutes plant varieties. This entails that the provision not only fails to delineate the term "*sui generis*" system of protection, it is also short of giving meaning to the term plant varieties.[1390] This said however, some scholars have indicated that the phrase plan variety refers to the "grouping of plants that share some essential characteristics."[1391]

Even though plant variety is approached this way by prominent scholars such as Carlos Correa, the fact that Article 27(3)(b) fails to shed light on the concept of plant variety may give considerable space to a member to determine the scope of plant variety under their domestic system.[1392] The scope of protection to be given domestically must, however, be in line with the obligation enshrined in the TRIPS Agreement, meaning that in spite of the policy space offered to members, the said members have obligations to design their national legal system to be in conformity with Article 27(3)(b) of TRIPS[1393]

[1386] Blakeney, "Patents and Plant Breeding," 73; McCabe, "The January 1999 Review of Article 27 of the TRIPS Agreement," 51&60; Tilford, "Saving the Blueprints," 408.
[1387] Andersen, "Norway says 'no' to UPOV '91 on plant breeders' rights,"; Tilford, "Saving the Blueprints," 408; German Federal Ministry for Economic Cooperation and Development, The UPOV Convention, Farmers' Rights and Human Rights: An integrated assessment of potentially conflicting legal frameworks, GIZ, (June 2015):16. UPOV is the most readymade law does not necessarily mean that countries have no option to develop their own system of *sui generis*. Members have the right to recourse to other options provided that the recourse is consistent with the TRIPS Agreement. For instance, countries such as India and Malaysia have developed their own system of *sui generis* protection.
[1388] See, James F. Oehmke et al., "Does Plant Variety Intellectual Property Protection Improve Farm Productivity? Evidence from Cotton Varieties," AgBioForum, 8 (2005):100; Campi and Nuvolari, "Intellectual property protection in plant varieties," 953.
[1389] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(3)(b).
[1390] See, Myriam Sanou, "Plant Varieties Protection: The Alternative Sui Generis Regime as Defended by the African Group", University of Namur, Belgium Research Center for Computer Law, (2007):2; Leverve et al., "Exploring the flexibilities of TRIPS to promote biotechnology in developing countries," 81.
[1391] Carlos Correa et al., "Plant Variety Protection in Developing Countries: A Tool for Designing a Sui Generis Plant Variety Protection System: An Alternative to UPOV 1991, APBREBES, (2015):16; Leverve et al., "Exploring the flexibilities of TRIPS to promote biotechnology in developing countries," 83.
[1392] Correa et al., "Plant Variety Protection in Developing Countries: A Tool for Designing a Sui Generis Plant Variety Protection System," 16.
[1393] The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27 (3)(b).

As stressed above, Patent protection is available for any invention in all fields of technology.[1394] This entails that as long as a particular invention meets the entire patentable requirements, countries are bound to offer Patent protection. Even though the patentability standards enshrined in Article 27(1) of the TRIPs must apply to all inventions, it might not always be convenient to evaluate the criteria from the standpoint of plant varieties.[1395]

Even though this is the case, plant varieties meeting the conditions of novelty, inventive step and utility are patentable as per Article 27 of TRIPS. As such, the "novelty" requirement of Article 27 (1) is aimed at ensuring the invention in question is not part of the state or the art or "prior art". This refers to whether or not a particular invention has been publicly available before the filing of the Patent application. As such, an invention that was already available in the public domain before the filing an application with a Patent office is not the subject protection under Article 27 (1) as it falls within the scope of prior arts.[1396]

When employing the eligibility criteria in relation to plant variety protection, there exists difficulty. This is so because for one, in relation to the novelty eligibility criterion. The reason behind is that, as noted above, the criterion is meant to ensure that the claimed invention is not to be found in the "state of the art" or "prior art" already in existence.[1397] Therefore, after having compared the claimed invention with the state of art/prior art, Patent examiners will establish the novelty as well as inventive step requirements.[1398] Nonetheless, difficulty is bound to emerge due to uncertainty related to the consideration of traditional knowledge as prior art and the form it takes.[1399] In this regard, even though the novelty criterion deals with a particular invention's absence from a public domain, the agreement does not provide for what is meant by an "invention" leaving the examination to be determined by national or regional patent laws.[1400] However, most national laws require the invention to be "...more than a mere discovery of a natural phenomenon or naturally occurring substance".[1401] In relation to plant varieties, this requirement excludes plant breeders who merely identify an already existing plant variety or landrace known only to a specific indigenous community.[1402] In this regard, the experience between developing and developed countries has not been similar. This is because, developed countries (United States, Japan and the countries of the European Union) have extended Patent protection to an isolated and purified form of a natural substances.[1403]

[1394] Ibid, Article 27(1).
[1395] Corea et al., "Plant Variety Protection in Developing Countries: A Tool for Designing a Sui Generis Plant Variety Protection System," 17.
[1396] See, Rajnish Kumar Rai, "Patentable Subject Matter Requirements: An Evaluation of Proposed Exclusions to India's Patent Law in Light of India's Obligations under the TRIPS Agreement and Options for India," Chicago Kent Journal of Intellectual Property 8, (2008):48.
[1397] Helfer, "Intellectual property rights in plant varieties," 45-46.
[1398] Ibid.
[1399] Ibid.
[1400] Ibid.
[1401] Ibid.
[1402] Ibid.
[1403] Carlos M. Correa, "Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options," (London & New York, Zed Books and Third World Network:2000):177; Dan Leskien & Michael Flitner, "Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System", 51 Issues in Genetic Resources No. 6, (1997): 8. For instance, according to Article 3(2) of the 1998 Directive on the Legal Protection of Biotechnological Inventions, "biological material which is isolated from its natural environment or produced by means of a technical process" may be patentable., For more, see Directive 98/44/EC of 6 July 1998, O.J. L213.

Developing countries have, however, declined Patent protection to such discoveries bearing in mind the fine line between 'discovery' and 'invention'. This has been a result of the fact that they have refused to grant Patent protection to discoveries that are found in nature given they have been isolated or purified by human intervention.[1404] Notwithstanding this, under the definition of invention, "any manner of new manufacture or any improvement, GMOs or seeds with terminator technology"[1405] might be considered new and may fall within the scope of patentability.

In a similar vein, the "inventive step" requirement as enshrined under Article 27(1) assesses "whether the claimed invention is not obvious to a person skilled in the art".[1406] In this context, even if a certain invention is novel, it must not be obvious to "a person of ordinary skill in that particular field of technology" in order to fall within the scope of patentability.[1407] When it comes to plant-related innovations (such as new plant varieties), it may be a significant hurdle to Patent protection given "the enormous speed of technological progress" in the field".[1408] This eligibility requirement puts a limit on future research and breeding activities as well as the right of farmers to save and reuse seeds.[1409] Member States could make use of a high criterion to assess inventive step taken in plant-related innovations so as to ensure the granting of Patents only when the invention is not obvious to a person with skills in the art.[1410]

Aside from the above criteria, the industrial applicability standard of patentability assesses the practical utility of a given invention. This means implies that in order for a certain invention to obtain Patent protection, the invention must be used in any kind of industry.[1411] The industrial application requirement as such assesses the applicability of a particular invention. In relation to plant varieties, this criterion is the least difficult to meet given the utilization of plant-related inventions in agriculture and plant breeding.[1412] Beyond the three criteria integrated into Article 27(1) of the agreement, a cumulative reading of Article 27(1) and Article 29 of the TRIPs provides that the obligation of disclosure is an equally important tenet for an applicant seeking Patent protection from a member country to the WTO. According to Article 29(1) of the agreement, a Patent applicant "**must disclose the invention in a sufficiently clear and complete manner** that permits a person skilled in the art to carry out the invention" (Emphasis added).[1413] This implies that Patent protection will be given to an inventor on the condition that an inventor discloses the invention so that third parties will

[1404] Correa, "Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options," 177; Dan & Flitner, "Intellectual Property Rights and Plant Genetic Resources," 8.
[1405] M Towhidul Islam, "Patent and Sui Generis Plant Varieties Protection under the TRIPS Agreement: Options for Bangladesh in the South Asian Landscape," (2015): 8. GMO refers to Genetically Modifies Organisms.
[1406] Helfer, "Intellectual property rights in plant varieties," 45; Rai, "Patentable Subject Matter Requirements," 49.
[1407] Ibid.
[1408] Leskien & Flitner, "Intellectual Property Rights and Plant Genetic Resources," 13.
[1409] Correa, "TRIPS-Related Patent Flexibilities and Food Security Options for Developing Countries", 9ff.
[1410] Ibid.
[1411] Ibid.
[1412] Helfer, "Intellectual property rights in plant varieties," 47.
[1413] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 29.

have an opportunity to "make and use" that particular invention without infringing, the right of a patent holder.[1414]

As a consequence, a Patent applicant for a plant variety that meets the requirements enshrined in Article 27(1) will be given an exclusive right starting from the date the Patent is filed by a particular Member State to the WTO. In doing so, Article 27(3)(b) of the TRIPs seeks protection in an area, *inter alia*, plant variety, that was previously not covered by a Patent system of protection in several WTO countries.[1415] Put differently, plant varieties were not subject of patent protection across a number of countries before the TRIPS Agreement came into force.[1416] This does not necessarily mean that plant varieties were not subject to a Patent system of protection at all. Regardless of lack of Patent protection in several countries, some nations, *inter alia*, the U.S.[1417] has given such protection to plant varieties even before the TRIPS Agreement.

In a similar vein, plant breeders that fulfill the patentable requirements as enshrined under the TRIPS Agreement will enjoy the exclusivity embodied in Article 28 of the agreement.[1418] In this context, Patent holders have the right to enjoy exclusivity for the period of time specified under Article 33 of the agreement. According to Article 33, the Patent protection to be given "shall not end before the expiration of a period of twenty years counted from the filing date".[1419] In this regard, when Article 27(1) is read in light of Article 33 of the agreement, it can be inferred that any invention that fulfills the standard of patentability enshrined in Article 27(1) will be given Patent protection that lasts for a certain fixed (twenty years) period of time[1420] during which time third parties will be excluded.

In connection to this, Article 28 stipulates the exclusive rights granted to innovators through such Patent system. Particularly, the provision sets out that, a Patent shall grant on the right holders the exclusive rights "to prevent third parties from the acts of making, using, offering for sale, selling, or importing for these purposes that product".[1421] In a similar vein, where the subject matter of a Patent is a process, the right holder has the right to exclude third parties "from the act of using the process, and from the acts of using, offering for sale, selling, or importing for these purposes at least the product obtained directly by that process".[1422] Put differently, the scope of exclusive right given to owners of inventions among others include

[1414] Ibid.
[1415] See, Campi and Nuvolari, "Intellectual property protection in plant varieties," 952. For historical development of IPRs in developing nations. See, Carolyn Deere- Birkbeck, "Developing countries in the global IP system before TRIPS: the political context for the TRIPS negotiations," In Research Handbook on the Protection of Intellectual Property under WTO Rules: Intellectual Property in the WTO, Vol. I, (Edward Elgar, UK and USA: 2010):22ff.
[1416] See, Campi and Nuvolari, "Intellectual property protection in plant varieties," 952. For historical development of IPRs in developing nations. See, Deere-Birkbeck, "Developing countries in the global IP system before TRIPS," 22ff. The TRIPS Agreement came into force on 1st January, 1995.
[1417] As a case in point see, the US's Plant Patent Act of 1930, which places plant varieties within the scope of patentable subject matter. See also, The US's Plant Variety Protection Act of 1970.
[1418] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 28 and 33.
[1419] Ibid, Article 33.
[1420] Ibid.
[1421] Ibid, Article 28(1)(a).
[1422] Ibid, Article 28.

the right to prevent third parties from making the product, using the process, offering for sale, selling, or importing for those purposes the patented product or the product obtained by the patented process.[1423] As a result, countries that opt for a Patent system of plant variety protection offer a provisional monopoly power over seeds, "the harvested material of a new plant variety and many others"[1424] for twenty years counting from the date of Patent application.[1425]

With this analysis in mind, the next section will divulge the other components as enshrined in Article 27(3)(b). As it is stressed in the aforesaid section, Article 27(3)(b) of the reflects largely the disagreement between developed and developing countries[1426], which have opted to put in place Patent and *sui generis* system of protection, respectively. In cognizant of the unsolved issue, the provision (27(3)(b)) stipulates that the TRIPs Council might review the content of the provision four years after the entry into force of TRIPs.[1427] In particular, the provision provides that "...this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement".[1428] Even though a review of the provision was expected to take place in 1999 (four years later), disagreement between developing and developed countries has stalled progress until the writing of this chapter.[1429] The aforesaid disagreement in the TRIPs Council with regard to the review of Article 27(3)(b) have revolved around three core issues: Patent protection, traditional knowledge and the relationship between the agreement and the Convention on Biological Diversity.

The main issue of discussion as regards Patent protection of plant varieties revolved around the following issues. For those countries (like the African Group), real amendments were proposed, specifically, as regards the protection of living forms in general and that of plant varieties.[1430] Moreover, the debate revolved around the need to give full consideration to the interests of local communities, farmers rights, traditional knowledge (TK), and the preservation of biodiversity.[1431] For this reason, an integral factor for the revision of Article 27(3)(b) has nothing to do with an amendment of the provision itself but the need to remedy the difficulty of patenting life matter by making effective use of the TRIPS flexibilities for the European Community in 2003 and 2004.[1432] The U.S. position in this regard favors the incorporation of key provisions from the 1991 version of UPOV by eliminating the exclusions

[1423] Ibid.
[1424] See, Campi and Nuvolari, "Intellectual property protection in plant varieties," 952.
[1425] See also, Footnote 8 to Article 33 which reads as, "It is understood that those Members which do not have a system of original grant may provide that the term of protection shall be computed from the filing date in the system of original grant,"
[1426] Bai, "Protecting Plant Varieties under TRIPS and NAFTA: Should Utility Patents Be Available for Plants?," 141ff.
[1427] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27 (3)(b).
[1428] Bai, "Protecting Plant Varieties under TRIPS and NAFTA: Should Utility Patents Be Available for Plants?," 141ff.
[1429] Helfer, "Intellectual property rights in plant varieties," 39-40,
[1430] See, Joint Communication from the African Group, IP/C/W/404 of 26 June (2003).
[1431] Ibid.
[1432] March 2004 Meeting of the Council. See also, the Communication from the European Communities and their Member States to the Council for TRIPS of 17 October 2002, IP/C/W/383.

for the patentability of animals and plants.[1433] These proposals have raised a number of concerns for developing countries that would like to preserve and put into effect the TRIPS exceptions in their place while utilizing the flexibility with regard to the choice of national *sui generis* system.[1434]

The other issue for the revision of Article 27(3)(b) had to do with the uneasy relationship which exists between the TRIPS agreement and the Convention on Biological Diversity (CBD).[1435] On this point, most developing countries maintained a common position[1436] arguing that the use of genetic resources by Patent applicants conflicts with the CBD obligation to seek prior informed consent and the equitable sharing of benefits with the contracting party providing the genetic material.[1437] For this reason, proposals have been put before the TRIPS Council to amend the agreement with due regards to these concerns.[1438] As can be understood from this discussion, the difference which exists between the interest of developing and developed countries in the core points of discussion in the TRIPS Council has delayed the revision process. In 2001, the Doha Declaration clarified that the work of the TRIPS Council as regards its review of Article 27(3)(b), the review of the implementation of the TRIPS Agreement under Article 71(1) and the work foreseen pursuant to paragraph 12 of this Declaration, to also take into consideration

> "...the relationship between the TRIPS Agreement and the Convention on Biological Diversity, the protection of traditional knowledge and folklore, and other relevant new developments raised by Members". [1439]

In general, it can be deduced from the aforesaid assertion that, the TRIPS provision (27(3)(b)) reflects the disagreement between developed and developing countries as regard the protection of plant varieties. As the above point demonstrates, any later endeavor to revise the normative content of the provision is yet subject to another controversy. In spite of the disagreement, the TRIPS members are duty bound to implement their obligation as regards plant variety through one (Patent system, in this context) of the modalities enshrined in article 27(3) (b). Having discussed the Patent system, the following section explores the second modality (*sui generis*/UPOV convention) as enshrined in article 27(3)(b) of the TRIPS Agreement.

[1433] Correa, "TRIPS-Related Patent Flexibilities and Food Security Options for Developing Countries". The initial proposals by the US, Japan, the Nordic countries and Switzerland aimed at broad patent coverage for plants and living organisms.
[1434] Communication from the United States of 19 November 1998, WT/GC/W/115.
[1435] The Convention on Biological Diversity (June 5, 1992).
[1436] the African Group proposal to harmonize the TRIPS Agreement with the CBD in WT/GC/W/202, and the Indian proposal in WT/GC/W/225. See also, Pedro Roffe, "Bringing Global Intellectual Property into Agriculture: The Agreement on Trade Related aspects of Intellectual Property Rights" in the Future Control of Food: A Guide to International Negotiations and Rules on Intellectual Property, Bio Diversity and Food Security, (Geoff Tansey and Tasmin Rajotte eds.,), (London, Earthscan: 2008): 65-66.
[1437] See, The Convention on Biological Diversity of (5 June 1992): Article 15.
[1438] See for example, IP/C/W/403 of 24 June 2003.
[1439] World Trade Organization, Doha Ministerial Declaration, (2001): Paragraph 19.

4.3.2. An Effective *Sui Generis* Protection for Plant Variety

4.3.2.1. UPOV and Plant Variety Protection

The preceding section has analyzed the TRIPS Agreement especially with reference to Patent protection as allowed for under Article 27(3)(b) of the agreement. As the above analysis has highlighted, Article 27(3)(b) of the agreement puts an obligation on Member States to protect plant varieties by an effective sui generis system.[1440] In spite of the absence of clarity as to the concept of *sui generis*, practice shows that most members of the WTO have opted to join UPOV Acts[1441] so as to fulfill their obligations in Article 27(3)(b) of the TRIPS Agreement. Accordingly, the discussion hereinafter will assess the legal framework provided for plant variety protection (hereafter, PVP) under the 1991 UPOV Convention (hereinafter, UPOV 1991 Act) which is growingly being considered as an acceptable regime for meeting the said State obligation.

The International Union for the Protection of New Varieties of Plants, developed under the auspices of the Union Internationale pour la protection des obtentions végétales (UPOV), has been adopted in 1961.[1442] This agreement has been significant in providing an international standard for the protection of plant varieties. In this regard, the UPOV Conventions remains the only multilateral treaties exclusively focused on intellectual property protection for plant varieties.[1443] As the UPOV system provides the only *sui generis* system for plant varieties protection in international law, there is a strong push especially on developing country members of the WTO to join the system through bilateral trade agreements with developed countries (notably U.S. and the EU) as per the said requirement under 27(3)(b).[1444]

The UPOV Convention has been revised several times, *inter alia*, in 1972, 1978 and most recently in 1991.[1445] It protects the rights of plant breeders[1446] provided that they develop

[1440] For more, see article 66(1) of the TRIPS Agreement. In view of Least Developed Countries' (LDCs') special needs, domestic constraints and need for policy space, the WTO TRIPS Council granted LDCs a transition period until 1 July 2021, during which LDCs need not comply with Article 27(3)(b) of the TRIPS Agreement, and are thus exempted from putting in place any regime for plant variety protection.

[1441] Most developing countries that have acceded to UPOV (mainly the 1978 and 1991Acts), have done so by considering the ready-made legislative framework it provides). See, Thomas Braunschweig, et al, "Owning Seeds, Accessing Food a Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and The Philippines", The Berne Declaration (BD), (2014): 11-13.

[1442] See, International Convention for the Protection of New Varieties of Plants (2 December 1961).

[1443] Laurence R. Helfer and Graeme W. Austin, "Human Rights and Intellectual Property: Mapping the Global Interface", Cambridge University Press, (2011): 384-385. In the U.S. for instance, Patents for plants and PVP are cumulatively available in the United States. In Europe, three pieces of legislation delineate the legal framework that applies to the protection of plant-related innovations: the 1973 European Patent Convention Directive 98/44/EC on the Legal Protection of Biotechnological Invention and Council Regulation 2100/94/CE on Community Plant Variety Rights. See, J.E.M. Ag Supply Inc. v Pioneer Hi-Breed International, 534 U.S. 124 (2001), where the U.S Supreme Court confirmed the compatibility of utility patents with concurrent plant specific IP regimes. The Biotechnological Directive is incorporated into the European Patent Convention by r.23b(1)EPC. Claudio Chiarolla, "Commodifying Agricultural Biodiversity and Development-Related Issues", The Journal of World Intellectual Property, vol. 9, no. 1 9 (2006).

[1444] Geoff Tansey & Tasmin Rajotte, "The Future Control of Food: A Guide to International Negotiations and Rules on Intellectual Property, Biodiversity and Food Security", (Earthscan, London: 2008).

[1445] Ibid; Helfer, "Intellectual property rights in plant varieties,". The 1991 Act entered into force on 24 April 1998 and on that same date the 1978 Act was closed to future accessions except by a few states already in the process of adhering to it.

plant varieties which meet the eligibility criteria for protection. Particularly, the UPOV 1991 elucidates a plant variety as a,

> "plant grouping within a single botanical taxon of the lowest known rank"[1447] that can be "defined by the expression of the characteristics resulting from a given genotype or combination of genotypes; distinguished from any other plant grouping by the expression of at least one of the said characteristics; and considered as a unit with regard to its suitability for being propagated unchanged".[1448]

A plant breeder which meets certain criteria enshrined under the UPOV 1991 Act has the right to get protection on its plant varieties.[1449] However, unlike the TRIPS Agreement where Patent protection is warranted for products as well as processes, the UPOV 1991 Act system does not provide protection to the "technical processes for the production of those varieties".[1450] This said, however, as will be elaborated subsequently, Member States could obtain Patent protection as regards processes under their national Patent laws or as authorized under the UPOV 1991, they could employ dual protection: Patent protection as well as PVP for their plant varieties.[1451] Even though UPOV has been subject to several revisions as indicated above, any country which seeks to join the Convention now is impliedly obliged to accede to the 1991 Act of UPOV.[1452] This is because since April 1988 accession to the 1978 Act has been closed.[1453]

Based on this consideration, it is evident that similar to the foregoing discussion on the TRIPS Agreement, the UPOV 1991 provides certain criteria for the protection of plant varieties. In this regard, under Article 5(1) of UPOV 1991 Act, the right of a plant breeder will be granted over a plant variety which is: new, distinct, uniform and stable.[1454] Moreover, the convention provides for what is implied by each of the stated criterion required for protection. Accordingly, a variety is considered to have fulfilled the requirement of novelty given it has not been offered for sale in the relevant market prior to the date of application.[1455] Furthermore, a variety is said to have fulfilled the distinctiveness criterion given it is different

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[1446] A plant breeder has been defined as someone who has engaged in the breeding, discovery and development of a given plant variety, International Convention for the Protection of New Varieties of Plants (2 December 1961) (revised 19 Mar. 1991): Article, 1(iv).
[1447] Ibid, Article i(iv).
[1448] Ibid.
[1449] Ibid, Article 5(1).
[1450] Chiarolla, "Commodifying Agricultural Biodiversity and Development-Related Issues".
[1451] J. Watal, "Intellectual Property Rights in the WTO and Developing Countries," Kluwer Law International, The Hague, (2000): 149. The 1991 UPOV act has eliminated the restriction imposed in the 1978 Act (Article 2.1) for dual protection.
[1452] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991).
[1453] Savita Mullapudi Narasimhan, "Towards A Balanced 'Sui Generis' Plant Variety Regime: Guidelines to Establish a National PVP Law and an Understanding of TRIPS-plus Aspects of Plant Rights", UNDP (2008):7; J.R. Ghose, "The Right to Save Seed," Working Paper 13, Rural Poverty and the Environment Working Paper Series, International Development Research Centre, Ottawa, (2005): 36.
[1454] See, International Convention for the Protection of New Varieties of Plants (2 December 1961): Article 5(1).
[1455] Ibid, Article. 6(1); Dan and Flitner, "Intellectual Property Rights and Plant Genetic Resources," 50-55.

from other varieties by virtue of its qualitative and quantitative characteristics.[1456] Uniformity is used to ascertain that the variety is uniform with regard to the specific features of its sexual reproduction or vegetative propagation.[1457] The last criterion assesses the stability of a given variety by examining whether a variety's essential characteristics persist even after repeated reproduction or propagation.[1458] Before a final decision is made as to the protection of a given variety, however, a breeder has to make an application to the relevant authority of his/her choosing[1459] after which point the relevant authority will examine if the variety in question fulfills all the afore-discussed eligibility requirements.[1460] Upon fulfilling these criteria, a plant variety will be listed in a national register or catalog which will disclose the variety as protected.[1461]

As can be surmised from the above discussion, a plant breeder that seeks protection for a plant variety has to meet the distinctiveness, uniformity, and stability (commonly referred to as DUS) eligibility criteria. Given a particular variety fulfills these requirements for protection, plant breeders get exclusive rights as incorporated under Article 14 of the UPOV 1991 Act.[1462] In this regard, breeders exercise the right to exclude third parties.[1463] According to Article 14 of the UPOV 1991 Act, acts that require the authorization of the breeder or put differently acts on which a breeder exercises exclusive right include, "production and reproduction, conditioning for the purposes of propagation, offering for sale, selling and marketing, exporting, importing and stocking for the any of the purposes mentioned".[1464] Besides making the afore-discussed acts subject to a breeders' authorization, the UPOV1991 Act, in addition, extends the exclusive right of breeders also over the harvested material. This is stated under Article 14 (2),

> "acts in respect of harvested material, including entire plants and parts of plants, obtained through the unauthorized use of propagating material[1465] of the protected variety shall require the authorization of the breeder, unless the breeder has had reasonable opportunity to exercise his rights in relation to the said propagating material".

This implies that a harvested material obtained through unauthorized use of a protected variety (essentially derived varieties) shall require the authorization of the breeder.[1466]

[1456] See, International Convention for the Protection of New Varieties of Plants (2 December 1961): Article7; Peter Kong, "An Effective sui generis System for Protection of Plant Varieties According to TRIPS," CHIMIA, 54, No.5. (2000).
[1457] See, International Convention for the Protection of New Varieties of Plants (2 December 1961): Article 8.
[1458] Ibid, Article 9.
[1459] Ibid, Article 10(1).
[1460] Ibid, Article 12.
[1461] ASSINSEL. "Position Paper on Farm Saved Seed", 2001a, (3May2001). Available at, www.worldseed.org/positions.html, accessed on 10. 06.2017.
[1462] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991): Article 14.
[1463] Ibid, Article 14(1).
[1464] Ibid, Article 14(1)(a).
[1465] UPOV does not provide for what is meant by "propagating material". For more, see "Seminar on Propagating and Harvested Material in the context of the UPOV Convention" held in Geneva on October 24, 2016. The proceedings of the Seminar can be found at http://www.upov.int/meetings/en/topic.jsp?group_id=73,
[1466] See, International Convention for the Protection of New Varieties of Plants (2 December 1961): Article 14(2).

Building on this, the UPOV 1991 provides two important exemptions to the exclusivity rights given to plant breeders, *inter alia*, subsequent breeders' right[1467] and farmers' privilege.[1468] The breeders' right exception connotes the right of a subsequent breeder to use "protected varieties as an initial source of variation for the creation of new varieties and to market the resulting varieties without authorization from the original breeder".[1469] This is covered under Article 15(1)(iii) of the UPOV 1991 Act. The farmers' privilege is covered under Article 15(2) as an optional exception in which each contracting party may,

> "...restrict the breeder's right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, the protected variety or a variety...".

This said, however, the UPOV 1991 provides for exceptions over which the breeder's right shall not extend. These include, acts done privately, those done for non-commercial purposes and acts done for the purposes of breeding other varieties (already highlighted above as the breeders' exemption).[1470]

The UPOV 1991 Act moreover provides for a fixed period as regards the duration for protection of breeders' right. In this regard, Article 19 provides that protection "...shall not be shorter than 20 years from the date of the grant of the breeder's right..."[1471] while for vines and trees, the period of protection "shall not be shorter than 25 years"[1472].

Having discussed the 1991 UPOV Act, the discussion below will compare the terms of two latest Acts of UPOV Convention; 1991 and the 1978 Acts; so as to pave a way for the subsequent analysis.

[1467] Ibid, Article 15(1)(iii)
[1468] Ibid, Article 15(2).
[1469] Graham Dutfield, "Turning Plant Varieties into Intellectual Property: The UPOV Convention," in The Future Control of Food: A Guide to International negotiations and Rules on Intellectual Property, Biodiversity and Food Security (Geoff Tansey and Tasmin Rajotte, eds.), (Earth Scan, 2008): 27-46.
[1470] See, International Convention for the Protection of New Varieties of Plants (2 December 1961): Article 15(1); Campi & Nuvolari, "Intellectual property protection in plant varieties,"; Institute of Economics, Scuola Superiore Sant'Anna di Studi Universitari e Perfezionamento, Piazza Martiri della Libertà 33, 56127, Pisa: Italy (2015): 355-356.
[1471] See, International Convention for the Protection of New Varieties of Plants (2 December 1961) (revised 19 Mar. 1991): Article 19(2).
[1472] Ibid.

4.4. UPOV 1978 and UPOV 1991 Convention: A Comparative Assessment

As indicated above, Article 27(3)(b) of the TRIPS Agreement provides for a *sui generis* system of protection to plant varieties. In this regard, given the fact that the provision falls short of defining the contents of *sui generis*, most countries have been led into joining the UPOV 1991 Act.[1473] In this regard, it is vital to take a step back so as to compare the terms of UPOV 1991 with its previous version (1978). As noted above, the UPOV 1991[1474] remains the sole version of the UPOV Acts which is currently open for further accession. This said, however, the two recent Acts, *inter alia*, 1978 and 1991, have brought about the most significant modifications to the main provisions of the 1961 Act.[1475] Even going beyond the 1961 version, the 1991 Act[1476] has introduced robust terms especially for the protection of original plant breeders.[1477]

The two UPOV Acts require the Member States to provide protection to plant species and genera[1478], however, varying as to their further requirements. When it comes to the protection to be provided to plant species and genera, the UPOV 1978 Act required States to protect five plant genera upon the date of entry into force of the convention and to progressively extend protection to an increasing number of genera or species.[1479] The UPOV 1991 Act, on the other hand, requires states to provide protection to at least fifteen plant genera or species upon ratifying or acceding to the convention and to extend such protection to all plant varieties within ten years.[1480] Moreover, under the UPOV 1978, dual protection is prohibited (Article 2(1)) such that a State can only provide protection to plant varieties either through Patent or PVP/Plant Breeders' Right.[1481] In a major departure from the UPOV 1978, the 1991 Act has removed the ban imposed on dual protection, hence, allowing the Member States to institute both systems of protection if they so wish.[1482] Building on this point, the UPOV 1978 allowed states to protect plant varieties produced through conventional breeding techniques even though it has been inferred as per Article 6(1)(a) that it allowed the protection of discovered varieties (which result from a natural source of initial variation).[1483]

[1473] See, GRAIN, Bilateral Agreements Imposing TRIPS-Plus Intellectual Property Rights on Biodiversity in Developing Countries (Mar. 2008); Zoë Goodman, Trade Human Rights Equitable Economy, Seeds of Hunger: Intellectual Property Rights on Seeds and the Human Rights Response, (May 2009); International Convention for the Protection of New Varieties of Plants 2 December 1961, (revised 19 Mar. 1991).

[1474] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991).

[1475] Dutfield, "Turning Plant Varieties into Intellectual Property," 27-46.

[1476] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991).

[1477] See, Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.

[1478] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991): Article 3(1); International Convention for the Protection of New Varieties of Plants article 5(1), (2 December 1961), (revised 23 Oct.1978): Article 4.

[1479] International Convention for the Protection of New Varieties of Plants article 5(1), (2 December 1961), (revised 23 Oct.1978): Article 4.

[1480] Ibid, Article 3(2).

[1481] Ibid, Article 2(1).

[1482] Watal, Intellectual Property Rights in the WTO and Developing Countries, 149.

[1483] International Development Research Centre et al., "Seeding solutions: Options for national laws governing control over genetic resources and biological innovations", Vol. 2, International Plant Genetic Resources Institute and Dag Hammarskjold Foundation, Ottawa, Rome and Uppsala (2001).

When it comes to the exclusive rights conferred on plant breeders, the two latest versions of UPOV (the 1978 and 1991) exhibit clear differences with the later strengthening further the rights of original plant breeders. In the UPOV 1978, breeders were granted the exclusive right to engage in activities of "...production of the variety's propagating materials for purposes of commercial marketing, the offering for sale of such materials, and the marketing of the materials".[1484] The UPOV 1991 has strengthened the breeder's rights to include "...reproducing the protected variety, conditioning it for propagation, exporting and importing the variety, and stocking it for any of these purposes".[1485] Moreover, under the UPOV 1978, the period of protection granted to a plant breeder was extended to a minimum of 15 years while for vines, forest trees, fruit trees, and ornamental trees, 18 years of protection was warranted.[1486] The UPOV 1991, however, strengthens the duration of exclusive rights protection of plant breeders by granting a minimum of 20 year protection period while for trees and vines, the period of protection extends to 25 years.[1487]

The two versions also demonstrate a difference as regards the exceptions included to the exclusive rights of plant breeders. Both UPOV 1978 and 1991 Acts provide for subsequent breeders' exemption (the right of subsequent breeders to use protected varieties as a source of variation for the creation of new varieties)[1488] and farmers' privilege (the right of farmers to reproduce the seed of a protected variety without the consent of the breeder)[1489] - even though the latest version of the treaty has narrowed down both exceptions.[1490] Accordingly, the 1978 version of UPOV allowed Signatory Parties to provide farmers' privilege which gives farmers the right to reproduce the seed of a protected variety without the consent of the breeder.[1491] This said, however, the application of this privilege varied across countries with some extending the privilege to include the saving of the purchased seed for future harvest while others have broadened it to include the selling and trading of seeds in limited quantities to other farmers.[1492] However, the 1991 version of UPOV, by making explicit the limits on farmers' rights, makes it an "optional exception". In light of this, Article 15(2) of the 1991 UPOV convention provides that each contracting party may,

> "...within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder's right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting . . . the protected variety".[1493]

[1484] International Convention for the Protection of New Varieties of Plants article 5(1), (2 December 1961), (revised 23 Oct.1978): Article 5(1).
[1485] Ibid, Article 14(2).
[1486] Ibid, Article 8.
[1487] Ibid, Article 19.
[1488] Ibid, Article 14
[1489] Ibid, Article 15(2).
[1490] Ibid, Article 15(2) and Article 5(1).
[1491] Ibid, Article 5(3).
[1492] Leskien & Flitner, "Intellectual Property Rights and Plant Genetic Resources,".
[1493] See, International Convention for the Protection of New Varieties of Plants, (December 2, 1961), (revised 19 March 1991): Article 15(2); GRAIN, "UPOV on the War Path" (June 1998). Available at: http://www.grain.org/briefings/, Accessed on 5/26/2017.

Even though the UPOV 1991 puts limit on the farmers' privilege, it provides for limited exceptions in respect of "...acts done privately and non-commercial purposes, acts done for experimental purposes and acts done for the purpose of breeding other varieties...", as incorporated in Article 15(1)(1) and 15(1)(2) of UPOV and for the purposes of public interest.[1494]

When it comes to the second exemption (breeder's exemption), a second-generation plant breeder was allowed to produce and market new plant varieties based upon already protected varieties without the authorization of the original breeder in the UPOV 1978.[1495] The UPOV 1991 still maintains the right of breeders to use protected varieties to produce new ones, however, putting a limit on varieties which are "essentially derived" from protected varieties.[1496] Moreover, the 1991 version has increased the number of acts for which prior authorization of the original breeder is required.[1497] Such acts do not just concern the reproductive or vegetative propagating material, but also encompass harvested material obtained through the illegitimate use of propagating material and so-called essentially derived varieties.[1498] This provision was inserted in the UPOV 1991 with the motive of curtailing second-generation breeders from making cosmetic changes (such as through the insertion of only one or few genes with little added value into the "germplasm" of protected plant varieties) to plant varieties and applying for PVP protection.[1499]

The UPOV 1991, moreover, provides for a definition of what is meant by a plant variety - unlike the 1978 Act, which did not provide any clarification - focusing more on the genetic makeup of the variety than its observable physical characters. It defines it under Article 1(vi) as a,

> "plant grouping within a single botanical taxon of the lowest known rank"[1500] that can be "defined by the expression of the characteristics resulting from a given genotype or combination of genotypes; distinguished from any other plant grouping by the expression of at least one of the said characteristics; and considered as a unit with regard to its suitability for being propagated unchanged".[1501]

As already highlighted above, developing country members of the WTO that do not wish to grant Patent protection to plant varieties are hence given the discretion (as per Article 27(3)(b) of TRIPS) to use the UPOV Convention as a model for developing their own *sui generis* systems or alternatively become members of UPOV. This approach has been utilized by Asian countries that have used the 1978 version of UPOV as model legislation due to the

[1494] See, International Convention for the Protection of New Varieties of Plants, (December 2, 1961), (revised 19 March 1991): Article 15(1)(1), 15(1)(2) & article 17(1). These provision conflict with "farmers rights" as envisaged in the FAO International Undertaking (art 9.1) and the Convention of Biological Diversity (art 10.c).
[1495] International Convention for the Protection of New Varieties of Plants art. 5(1), (2 December 1961), (revised 23 Oct.1978): Article 5(3).
[1496] Ibid, Article 5(1).
[1497] Ibid.
[1498] Ibid, Article 14. 3 & 14.5(b).
[1499] Ibid, Article 14.5 & 15; Helfer, "Intellectual property rights in plant varieties," 28.
[1500] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 March1991): Article 1(vi).
[1501] Ibid.

flexibility it provided for the incorporation of farmers' privilege.[1502] Any country wishing to become a member of UPOV after 24th April 1998, however, is obliged to become a party to the 1991 Act since the 1978 Act, as noted above, has been closed for further accession.

As can be inferred from the preceding discussion, the two multilateral systems of IPRs protection for plants (Patents and PVP) provide different schemes of protection even though the 1991 Act of UPOV has incorporated components that resemble Patent protection. This is because the UPOV 1991 Act has strengthened the right of original plant breeders and has watered down the farmers' privilege by making it an optional exception.[1503] In conclusion, it can be asserted that under the UPOV system of PVP protection, eligibility requirements for protection are not difficult to meet when compared to Patent systems while the scope of protection of exclusive rights is narrow due to the exceptions the system provides (breeders' exception and farmers' privilege). On the contrary, eligibility requirements for Patent protection are cumbersome to meet while exclusive rights holders are granted broad rights to exclude third parties from the exploitation of the patented invention.[1504]

[1502] Ibid, Article 14.5 & 15. India enacted the Protection of Plant Varieties and Farmers Rights Act in 2001, it sought to protect plant varieties, while at the same time enabling farmers to save, re-sow, exchange and sell new plant varieties developed by farmers and breeders. See, UN General Assembly (Report of the Special Rapporteur on the right to food, Seed policies and the right to food: enhancing agro biodiversity, encouraging innovation, 64th session of the General Assembly, U.N. Doc. A/64/170, 23 July 2009):7.

[1503] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991): Article 15(2)

[1504] Helfer & Austin, "Human Rights and Intellectual Property: Mapping the Global Interface", 390.

5. The TRIPS Patent Rule on Plant Variety: A Regress in the Enjoyment of the Right to Food

Bearing in mind the aforesaid analysis, it is important under this section to look for an answer to the quest: how do the aforesaid rules on plant variety squeeze the full enjoyment of the right to food and restrict the accessibility of scientific results to the public? As it is already demonstrated under chapter two of this research, it is evident that the ICESCR obliges State Parties to the Covenant to recognize the right to science.[1505] In a similar vein, Article 11 of the Covenant obliges its Parties to recognize the right to food.[1506] Particularly, while paragraph one of the provision (Article 11) provides that, "the States Parties to the Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food," paragraph two of the provision stipulates that "the States Parties to the Covenant, recognize the fundamental right of everyone to be free from hunger".[1507]

In cognizant of the latter right, as already noted, the CESCR has elaborated the normative contents of the right under General Comment Number 12.[1508]As such, State Parties have assumed the obligation to respect, protect and fulfill the right to food as required under Article 11 of the ICESCR.[1509] In this context, although the CESCR has elaborated the constituent elements of the right to food, the elements forming part of the right to science yet lack a General Comment, meaning that the CESCR has not so far elaborated the normative elements of the right to benefit from scientific progress.[1510] This is so because the Committee has not until now made use of the two processes it normally utilizes, has not held a day of general discussion with key human rights bodies or has not adopted a General Comment seeking clarification as regards the provision's interpretation.[1511]

As already indicated, even though the provision (Article 15(1)(c)) lacks explanation from the side of the CESCR, a number of legal scholars[1512], including the UN Special Rapporteur in the field of cultural rights, Farida Shaheed, have endeavored to shed light on the normative content of article 15(1)(c). Particularly, the Special Rapporteur has stressed that "access by everyone without discrimination to the benefits of science and its application" is among the

[1505] See, The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights," (1966): Article 15(1)(b).
[1506] Ibid, Article 11(1) and (2).
[1507] Ibid.
[1508] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999).
[1509] Ibid.
[1510] For more, see the discussion under Chapter Two of the research.
[1511] Chapman, "Towards and Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications", 1ff.
[1512] Ibid; Donders, "The Right to Enjoy the Benefits of Scientific Progress," 371; W.A. Schabas, "Study of the Right to Enjoy the Benefits of Scientific and Technological Progress and Its Applications", in Y. Donders and V. Volodin (eds), Human Rights in Education, Science and Culture- Legal Developments and Challenges, Aldershot, Ashgate, 2008: 273; Timmermann, "Sharing or Benefiting from Scientific Advancement ?", 111; UNESCO, Venice Statement, Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, (2009); Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012); Shaver, "The Right to Science," 411-430; Donders et al., "The Human Right to Enjoy the Benefits of the Progress of Science and Its Applications," 34-36.

normative contents of the right enshrined in article 15(1)(c).[1513] As already explored under chapter two of the research, this entails that access to science as a whole and, particularly, advances made by application of scientific technologies or knowledge must be guaranteed or accessible to all.[1514] This implies that advances or genetic improvements made to plant varieties[1515], such as Genetically Modified (GM) seeds must be available and accessible to everyone. These advances are also the constituent elements of the right to food, meaning that the right to benefit from scientific progress has strong nexus with other human rights, which among others includes the right to food[1516] and the constituent elements forming part of this right.

[1513] See, Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).
[1514] Ibid, Paragraph 25-29.
[1515] See, FAO, The International Treaty for Plant Genetic Resources for food and agriculture, Rome, Italy (FAO 2009). "Variety" means a plant grouping, within a single botanical taxon of the lowest known rank, defined by the reproducible expression of its distinguishing and other genetic characteristics.
[1516] See, Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012); Schutter, "The Right of Everyone to Enjoy the Benefit of Scientific Progress and the Right to Food," 5ff.

5.5.1. How Does Patent Protection Constrain the the Realization of the Right to Food and Weighs down on the Acessibility of Scientific Progress?

Bearing this issue in mind, before endeavoring towards an answer to the question raised in the preceding section of this chapter, it is crucial to recall from the discussion under chapter two that today's global challenge as regards food insecurity emanates mainly not only from lack of availability of food as the world produces enough food[1517] but rather due to lack of accessibility and distribution of adequate food.[1518] Under this milieu, the enactment and later expansion of Intellectual Property protection in plants (as obliged for under Article 27(3)(b) of the TRIPS agreement) may contribute to this assertion. This is because the expansion of strong exclusive rights in plants varieties has put restrictions especially on the "economic accessibility" of adequate food to farmers,[1519] especially, as regards GM seeds.

In this context, it is palpable that GM seeds are a byproduct of scientific progress, which connotes that everyone has the right to enjoy the benefits arising from progress made through science as regards, particularly, GM seeds.[1520] However, the enjoyment of such a right may restrained in the presence of exclusive rights granted to Patent holders.[1521] Hence, this implies that the introduction of IPRs in general and Patent protection in particular in plant-related scientific improvements puts restrictions on the right of the public to benefit from results of scientific progress.[1522] Simultaneously, Patent protection in plants restricts the full enjoyment of the right to food as elaborated under General Comment 12 of the ICESCR.[1523] According to the CESCR, accessibility of adequate food, which is considered a core content for the realization of the right to adequate food, as already noted, has been defined as constituting both physical and economic accessibility.[1524] As provided under Chapter two, economic accessibility, in turn, has been elaborated to imply, "personal or household financial costs associated with the acquisition of food for an adequate diet should be at a level such that the attainment and satisfaction of other basic needs are not threatened or compromised".[1525]

[1517] Olivier De Schutter, Seed Policies and the Right to Food: Enhancing Agrobiodiversity, Encouraging Innovation, Report by Special Rapporteur on the Right to Food, (2009), U.N. GAOR, 64th Sess., at 2, U.N. Doc. A/64/170.
[1518] Philippe Cullet, "Food Security and Intellectual Property Rights in Developing Countries," IELRC Working Paper 3, International Environmental Law Research Centre, Geneva, Switzerland (2003); Messer, Ellen, "Food Systems and Dietary Perspectives: Are Genetically Modified Organisms the Best Way to Ensure Nutritionally Adequate Food?," Indiana Journal of Global Legal Studies: Vol. 9, no. 1. (2001):68. See also the discussion under chapter two of this research.
[1519] See Shawn McGuire and Louise Sperling, "Seed systems smallholder farmers use", Food Security, volume 8, Issue 1 (February 2016): 179-195.
[1520] See, Schutter, Seed Policies and the Right to Food, 2ff.
[1521] The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 28(1).
[1522] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights," (1966): Article 15 (1)(b).
[1523] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999).
[1524] Ibid, Paragraph 13.
[1525] Ibid.

On the basis of this, it can hence be argued that the current strengthening of Patent protection granted to agribusiness MNC's has put major restrictions on farmers' seed system.[1526] This is because farmers have traditionally re-used those seeds with desirable character so that it can be replanted during the next harvest season.[1527] Moreover, the seeds from one season could be saved for the following season through the process of seed saving.[1528] These practices have helped farmers over centuries to develop better seed varieties. Moreover, such practices have been helpful in cutting down the costs farmers would have incurred in buying new seeds each season.[1529] However, the exclusive rights granted to Patent holders that have made improvements in plants (for instance on seeds, plant cells, or DNA sequence) has restrained the possibility for accessing the protected invention.[1530] As already implied in the previous sub-sections, Patent protection gives a Patent holder the right to exclude third parties (in this context, farmers) from the acts of "making, using, offering for sale, selling, or importing" the product as well as the process which is so protected.[1531] This implies that anyone seeking to use such protected plant-related inventions (GM seeds) has to get either an authorization from the Patent holder for carrying out such activities or absent such permission (which is the most likely scenario) has to pay the expensive price charged so as to access the GE seeds.

This means that farmers that need access to seeds for their daily subsistence as well as to make improvements in plants would be asked to discontinue their customary practices of seed saving, reuse, and exchange.[1532] This is notwithstanding the fact that farmers have customarily relied on various means to save, reuse and exchange seeds.[1533] As a case in point, Plant Genetic Resources (hereafter, PGRs)[1534] have been preserved and managed by farmers in developing countries who cultivate wild varieties of plants (landraces/traditional farmers varieties) in order to conserve the genetic diversity in the agricultural sector.[1535] Moreover, these practices of farmers have been instruments for the distribution of crops locally.[1536] Besides these benefits to be drawn, such informal systems of cultivation are known for preserving the raw genetic material of plants for the purposes of future research and plant breeding activities.[1537] It is through such traditional practices that farmers have made ends

[1526] Neils Lowarrs, Seeds of Confusion: The Impact of Policies on Seed Systems, (Wagningen, Netherlands, 2009).:29-49.
[1527] Justin T. Rogers, "The Encroachment of Intellectual Property Protections on the Rights of Farmers", 15 Drake J. Agric. L., (2010): 357-358; Borowiak, Farmers' Rights: Intellectual Property Regimes and the Struggle over Seeds, 511-543.
[1528] See for example, Correa, Plant Variety Protection in Developing Countries: A Tool for Designing a Sui Generis Plant Variety System.
[1529] See, Rogers, "The Encroachment of Intellectual Property Protections on the Rights of Farmers," 357-358; Borowiak, Farmers' Rights: Intellectual Property Regimes and the Struggle over Seeds, 511-543.
[1530] Schutter, "Seed Policies and the Right to Food.
[1531] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Art 28(1)(a) and (b).
[1532] See, Schutter, Seed Policies and the Right to Food.
[1533] See for example, Correa, Plant Variety Protection in Developing Countries: A Tool for Designing a Sui Generis Plant Variety System.
[1534] PGR's have been defined by the International Treaty on Plant Genetic Resources for Food and Agriculture, 2001, as "any genetic material of plant origin of actual or potential value for food and agriculture". See, FAO, International Treaty on Plant Genetic Resources for Food and Agriculture, (3 November 2001): Article 2.
[1535] Helfer & Austin, Human Rights and Intellectual Property: Mapping the Global Interface, 394-395
[1536] Ibid.
[1537] Ibid.

meet and managed to achieve resilience in response to changes in climate, diseases, and pests for a long time.[1538]

It is with this due recognition that (under the auspices of FAO), the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) was adopted in 2001.[1539] The treaty has established the international rules regarding the access, sustainable use and benefit sharing arising out of Plant Genetic Resources for Food and Agriculture (PGRFA).[1540] In this respect, the ITPGRFA is the only binding international instrument which, in harmony with the Convention on Biological Diversity[1541], pays recognition to farmers rights.[1542] Accordingly, the treaty calls upon the contracting parties to,

> "recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity, have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world".[1543]

It moreover defines farmers' right as inclusive of, the right to participate in making decisions on matters related to the conservation and sustainable use of PGRs, the right to equitably participate in sharing benefits arising from the utilization of PGRs for food and agriculture, and the conservation of traditional knowledge related to PGRs for food and agriculture.[1544] To this end, the treaty puts the responsibility for realizing Farmers' Rights, as they relate to PGRFA, with national governments.[1545] The ITPGRFA vows to rid the appropriation of PGRs, by the above-noted TRIPS minimum requirements for the patentability of life forms (including plants), without the consent of, or without adequate sharing of the benefits with, the farmers and communities who have developed those resources.[1546] The treaty provides in this regard that, subject to national law and as appropriate, the provisions shall not be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material.[1547] Thus, the treaty recognizes rights "...to save, use, exchange and

[1538] See, Schutter, "Seed Policies and the Right to Food,"; Schutter, The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.
[1539] See, FAO, International Treaty on Plant Genetic Resources for Food and Agriculture, (3 November 2001).
[1540] See, Schutter, "Seed Policies and the Right to Food,"; Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350; Convention on Biological Diversity, (5 June 1992): Article 1.
[1541] See, Convention on Biological Diversity, (5 June 1992); Regine Andersen, The History of Farmers' Rights: A Guide to Central Documents and Literature, (The Fridtjof Nansen Institute, 2005). The Convention on Biological Diversity did not make any reference to farmers'rights. Nothwithstanding this, Resolution 3 of the Nairobi Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity has recognized the need to seek solutions to two pertinent matters concerning plant genetic resources, one of which related to "the question of farmers' rights".
[1542] Carlos M. Correa, "TRIPS-Related Patent Flexibilities and Food Security: Options for Developing Countries,".
[1543] See, FAO, International Treaty on Plant Genetic Resources for Food and Agriculture, (3 November 2001): Article 9(1).
[1544] Ibid, Article 9(2)(a)(b)(c).
[1545] Ibid, Article 9(2).
[1546] For more, see Schutter, "Seed Policies and the Right to Food,".
[1547] See, FAO, International Treaty on Plant Genetic Resources for Food and Agriculture, (3 November 2001): Article 9(3).

sell farm-saved seed and other propagating material, and to participate in decision-making regarding, and in the fair and equitable sharing of the benefits arising from, the use of plant genetic resources for food and agriculture"[1548] as being instrumental to the realization of Farmers' Rights, as well as the promotion of Farmers' Rights at national and international levels.[1549] In spite of the due recognition the treaty grants to farmers' rights in the multilateral framework, the interpretation as well as the implementation of farmers' rights has thus far been weak and is not identical across all countries.[1550]

As a consequence of this lag, the introduction of exclusive rights in plants has meant that the above noted customary practices of farmers' are considered illegal and as infringements on a Patent holder's exclusive right.[1551] This is because farmers that want to purchase seeds from the commercial market are required to sign license agreements (also known as contract clauses as allowed under article 28(2) of the TRIPS Agreement) with seed providers.[1552]

Hence, as part of the license agreement they enter into, farmers agree to only plant the seed they have purchased for one harvest and hence concurring neither to save nor sell the improved seed.[1553] This implies that as part of the license agreement they enter into, farmers are obliged to discontinue their customary practices of seed saving, re-use, and exchange.[1554] As a consequence, farmers have been forced to purchase seed for the following harvest from seed companies hence ensuring their influence in determining how the purchased seed should be utilized as well as managed (through the employment of inputs such as fertilizer, pesticide).[1555] Accordingly, a farmer who is found to be in violation of these seed licensing agreements is forced to pay expensive fees for liquidation damage (in some cases a farmer must pay liquidation damages an amount equal to one hundred times the technology fee for that gene, multiplied by the number of units of transferred seed, in addition to compensation for reasonable attorneys' fees).[1556] The effect of such agreements is filled even during post-harvest use and sale of the patented crop.[1557] All these factors have resulted in the

[1548] Ibid, Article 9(2)(a)(b)(c); Convention on Biological Diversity, (5 June 1992): Article 1.
[1549] See, FAO, International Treaty on Plant Genetic Resources for Food and Agriculture, (3 November 2001): Preamble.
[1550] See, Schutter, "Seed Policies and the Right to Food,".
[1551] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 28(1) & (b).
[1552] Ibid, Article 28(2).
[1553] See, Ryan Crawford, "Did I Save My Seed for This? United States Intellectual Property Law, the Continuing Shift in Protection from Growers to Developers, and Some Potential Implications for Agriculture," Syracuse Sci. & Tech. L. Rep. 35, 35 (2006); Peter Straub, "Farmers in the IP Wrench: How Patents on Gene-modified Crops Violate the Right to Food in Developing Countries?," 29 Hastings Int'l & Comp. L. Rev. 187 2005-2006: 196-199.
[1554] Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350; Straub, "Farmers in the IP Wrench," 196-199.
[1555] Michael T. Roberts, "National Agricultural Law Center Research Article, J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.: Its Meaning and Significance for the Agricultural Community", Southern Illinois University Law Journal, Vol. 28, National Agricultural Law Center, (2003):98ff; Sylvia Carter, One Potato, New Potato / Farmers and Biotech Companies are Battling for Control, NEWSDAY, (1999): 51.
[1556] Stephen Nottingham, "Eat Your Genes: How Genetically Modified Food is Entering Our Diet" (Zed Books, 2003):112.
[1557] See for example, Straub, "Farmers in the IP Wrench," 196-199.

multiplication of litigation between farmers and seed companies.[1558] This obligation connotes that farmers who cultivate protected seeds do not possess any right over the seeds they harvest rather they are simply considered to be licensees of a patented product.[1559]

As such, in an environment where farmers have been barred from carrying out their customary practices, they will be forced to rely on the provision of expensive commercial seeds from the private sector.[1560] This implies that farmers right, especially in relation to their economic independence will be threatened as they are no longer in a position neither to provide seeds locally nor to their household in contravention to "economic accessibility"[1561] as stipulated in General Comment 12.

In this regard, it is easy to observe the underlying factor behind. This is due to the concentration of agribusiness MNC's in recent years in seed production and distribution.[1562] This concentration has since recently been hastened as a result of mergers and acquisitions which have been entered into among key segments of the agricultural industry (seed companies, input providers, *inter alia*, fertilizers, pesticides, herbicides).[1563] Agribusiness MNC's recourse to mergers and acquisitions has been encouraged by the desire to increase the market share for their modified varieties.[1564] This trend has put restrictions on farmers' access to productive resources, *inter alia*, seeds.[1565] This is because making use of the exclusive rights they are granted, agribusiness MNC's have resorted to segmenting the market by setting high prices on seeds (including inputs) at a rate much higher than their actual price.[1566] As such, the concentration of MNC's in seed production has forced farmers to be dependent on the expensive price set by the private sector.[1567] This has made poor farmers especially susceptible as they cannot afford the price charged by the private sector.[1568] This shows that farmers right to adequate food especially as regards the "accessibility of food in ways which

[1558] For example, Monsanto, a single corporate seed-giant, has filed more than 475 seed piracy lawsuits against farmers for violations of seed-license agreements. See also, Roberts, "National Agricultural Law Center Research Article, J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.," 90.
[1559] Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.
[1560] See, Straub, "Farmers in the IP Wrench," 196-199; Borowiak, "Farmers' Rights: Intellectual Property Regimes and the Struggle over Seeds," 511-543.
[1561] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.
[1562] I.M Moretti, "Tracking the trend towards market concentration: The case of the agricultural input industry, United Nations Conference on Trade and Development," Geneva, Switzerland, UNCTAD/DITC/ COM/2005/16; ETC, "Breaking Bad: Big Ag Mega-Mergers in Play," ETC Group Communiqué 115, (2015).
[1563] Ibid; ETC Group, "Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life," November 2008, Accessed on 7/1/2018); ETC Group, 2013b, "Putting the cartel before the horse…and farm, seeds, soil, peasants, etc. Who Will Control the Agricultural Inputs?," (4th December, 2013), Accessed on 7/1/2018. For a more updated information on "Summary and Analysis of Mergers between Global Seed Companies in 2016" visit http://news.agropages.com/News/NewsDetail---21186.htm,
[1564] See, Moretti, "Tracking the trend towards market concentration,"; ETC. "Breaking Bad: Big Ag Mega-Mergers in Play,".
[1565] Ibid.
[1566] See, Geoff Tansey, "Supplementary written evidence to the All-Party Parliamentary Group Inquiry into 'World Food Security and the UK", (2009): Paragraph 13.
[1567] See, Straub, "Farmers in the IP Wrench," 196-199.
[1568] Ibid; Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.

are sustainable and do not intervene with the enjoyment of other human rights"[1569] (accessibility to present and future generations) has faced limitation as a result of Patent claims.

As already highlighted, the obligation to provide Patent protection to plant varieties as enshrined in Article 27(3)(b) of the TRIPS Agreement, poses an additional noticeable challenge on food "sustainability".[1570] As can be recalled from the discussion under chapter two, the CESCR has defined food sustainability as ".....implying food being accessible for both present and future generations".[1571] This is because one of the integral components for the realization of the right to adequate food has to do with "accessibility of food in ways that are sustainable and that do not interfere with the enjoyment of other human rights".[1572] The provision of Patent protection in plant related inventions as such restricts access to the "genetic material"[1573] upon which to build experiments on. This is because, as already elucidated, the exclusive rights granted to Patent holders give right holders the right to prevent third parties from the act of using the product or process in question.[1574] This means that third parties (farmers) are barred from accessing the protected plant genetic material until the Patent period expires upon which point the invention will be publically available.[1575] This has been a result of the expansion of Patent protection in number, scope as well as claims being made over different parts of a given protected plant variety.[1576] This expansion of Patent claims has led to what is referred as 'Patent thicket' in which overlapping Patent claims made by Patent holders hinders access to research results (such as GM seeds) and technologies.[1577] This has an impact on future breeding activities of breeders and researchers in the agricultural sector.[1578] This shows that Patents granted in plant related invention by delaying further

[1569] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 8. Most recently, a groundbreaking case law has taken place concerning the seed company Monsanto's Roundup herbiside. The case involved a claim brought by Edwin Hardeman of Santa Rosa who was the first person to challenge Monsanto's Roundup has caused him to develop non-Hodgkin's lymphoma (NHL), a cancer that affects the immune system. In its final ruling, the federal jury found Monsanto's Roundup herbicide to be substantial factor in causing the cancer ofthe plaintiff, in a landmark verdict that could affect hundreds of other cases. See, Monsanto: Roundup Substantial Factor in a Man's Cancer Jury finds in Key Verdict, Available at https://www.theguardian.com/business/2019/mar/19/monsanto-trial-roundup-verdict-edwin-hardeman-cancer?fbclid=IwAR0hTLaRPvea3u4mwGCjRVBsAfSxNi0fHeEelee68w8PB6X87KQoaoV7zzc, Accessed on 19/06/2019.

[1570] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 7.

[1571] Ibid.

[1572] Ibid.

[1573] See, FAO, International Treaty on Plant Genetic Resources for Food and Agriculture, (3 November 2001). Genetic material has been defined as "...any material of plant origin, including reproductive and vegetative propagating material, containing functional units of heredity".

[1574] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 28(1&2).

[1575] Ibid, Article 33.

[1576] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991): Article 1(vi).

[1577] Moretti, "Tracking the trend towards market concentration," 22-23.

[1578] Ibid.

research in the agricultural sector have restricted the "accessibility" of adequate food to present and future generations.[1579]

As already synopsized in the foregoing section, Patent protection warrants the right holder the privilege to exercise the exclusive right as regards the activities of "making, using, offering for sale, selling, or importing"[1580] a protected variety. This implies that anyone that wants access to the protected products (processes as regards for example new techniques of plant breeding) has to pay the expensive price (less economic affordability) charged by the Patent owner.[1581] This may especially have negative ramification on poor farmers that will be forced to pay the expensive price in order to have access to GM seeds. This means that Patent protection in plants by requiring the payment of expensive price for the purchase of improved plant varieties puts restriction on the ability of farmers to fulfill other basic needs which is in violation of the enjoyment of the right to science as well as economic accessibility, which is the core element for the realization of the right to adequate food.[1582] As such, because of the high price (less affordability) agribusiness MNCs set in the market for access to GM seeds, farmers have been forced to prioritize between the purchase of seeds for their livelihood and the possibility of meeting other basic needs.[1583] This contradicts with the very content of "economic accessibility" for ensuring the right to adequate food which has been clarified as referring to having sufficient financial means for the acquisition of food such that the attainment of other basic human rights will not be threatened.[1584]

As already noted above, one of the ways in which Patent protection has impeded the realization of the right to adequate food relates to the restrictions Patent holders have imposed on traditional farmers' practices. This implies that, as already connoted above, the concentration of the private sector in the development and provision of modern GM plant varieties has put limits on farmers as regards their traditional practices of seed saving, selling and exchange.[1585] This is in violation of the availability dimension for ensuring the right to adequate food as elaborated by the CESCR which refers to "availability of food in a quantity and quality, free from adverse substances, and **acceptable within a given culture**".[1586] The infiltration of Patent holders into the traditional practices common in most farming societies (via the license agreements they sign with farmers) hence violates the obligation of states to ensure availability of food as acceptable within the customary practices of farmers**.** Due to this restriction imposed on the customary practices of farmers in developing countries, the

[1579] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 7.
[1580] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 28 (1) (a & b).
[1581] For more, see Kaitlin Y Cordes, "The Impact of Agribusiness Multinational Corporations on the Right to Food, in Accounting for Hunger: The Right to Food in the Era of Globalization," (Olivier De Schutter and Kaitlin Y Cordes; eds.), (Hart Publishing, UK: 2011): 27-64.
[1582] See, Niels Louwaars, "Seeds of Confusion; The impact of policies on seed systems," PhD diss., Wageningen, The Netherlands (2007):106-107.
[1583] See, Cordes, "The Impact of Agribusiness Multinational Corporations on the Right to Food," 27-64.
[1584] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.
[1585] Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food1; Haugen, Muller et al., "Food security and intellectual property rights Finding the linkages.
[1586] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 8.

innovative capacities of farmers to breed better and locally adopted varieties has been curtailed upon.[1587]

The main reason for this lies in the fact that the agricultural biotechnological sector does not recognize traditional farmers practices by which PGRs have been preserved and maintained throughout the years.[1588] As noted, the international system of IPRs protection hence does not give due consideration to farmers traditional techniques due to the conviction that they are incapable of producing products that can be sold on a large scale.[1589] This is because for the commercial agricultural sector, uniformity of crops is highly promoted with the aim of ensuring each plant which is sown presents similar characteristics in its mechanical harvesting (such as uniform ripening time as well as sufficient strength of the plant to be picked up by machines).[1590] For this reason, the agro-biotechnological sector lacks the interest to incorporate breeding directed at smallholders.[1591] This is a byproduct of the research orientation of the private sector which has its eyes set on the production of commercially attractive products.[1592] This profit driven motive of the private sector implies that less attention is being devoted to meeting the needs developing countries and of the poor.[1593]

Under this context, even if it might be argued that the production of commercially attractive products such as the improved seeds has benefits[1594], the Patent scheme given to producers in this particular sector aside from restricting access to such improvements, further impedes the right to food.[1595]

Even though the afore discussed IPR systems in plants (i.e. Patent and PVP) have differences in this regard, it is clear that both systems, as can be seen at a later stage, have introduced restrictions on such activities. Taking specifically the limitation put on seed exchange as an example, it can be attested that this trend directly contradicts with customary practices common in different societies.[1596] The traditional believes different societies hold as regards their relationship to their ancestral land as well as their conception of knowledge as a commons, has faced limitations as a result.[1597] With regard to the ownership of knowledge, it is interesting to note that in many developing societies knowledge used to be owned

[1587] For more, see Keith Aoki, "Seed Wars: Controversies and Cases on Plant Genetic Resources and Intellectual Property," (2008); Jack Kloppenburg, Jr., & Daniel Lee Kienman, "Seed Wars: Common Heritage, Private Property, and Political Strategy," Socialist Rev. 6. (1987).
[1588] See, Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.
[1589] Lowaars, "Seeds of Confusion," 106-107.
[1590] Chiarolla, "Intellectual Property, Agriculture and Global Food Security," 61-62.
[1591] Schutter, "Seed Policies and the Right to Food,"; Cullet, "Intellectual Property Rights and Food Security in the South," 265-266.
[1592] Schutter, "Seed Policies and the Right to Food,".
[1593] Ibid, Cullet, "Intellectual Property Rights and Food Security in the South," 265-266.
[1594] Schutter, "Seed Policies and the Right to Food," 10. For example, "plant varieties that offer high yields when adequate conditions are present and when combined with appropriate inputs can limit the expansion of cultivated land and thus save virgin soils, which are a reservoir of biodiversity; certain varieties can have improved nutritional values, or specific disease resistance; and certain crops can be developed which are suitable for saline, dry or other marginalized soils".
[1595] See, The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights," (1966): Article 11.
[1596] Ibid, Article 15(1)(a).
[1597] Zoë Goodman, "Seeds of hunger".

collectively and used for the benefit of the society at large.[1598] However, such practices are in contravention with the very basis of the IPRs system which prioritizes profit generation over socital interest.[1599] Hence, this is in violation of "cultural acceptability" as included in Article 11 and elaborated in General Comment 12.[1600] The relevant provision under paragraph 11 connotes, the need by State Parties to take into consideration "perceived non nutrient-based values attached to food and food consumption and informed consumer concerns regarding the nature of accessible food supplies".[1601]

As already highlighted in the foregoing discussions, the agro-biotechnological sector gives priority to the production of genetically uniform seeds.[1602] However, the genetic uniformity of commercial crops has exposed improved varieties from adapting to changing conditions (such as those related to climate, soil, pests, and diseases).[1603] This has an impact on the accessibility of seeds as the inability of commercially improved seeds to adapt to change will enhance the susceptibility of GM seeds to be easily wiped out in such circumstances.[1604] For instance, in India, the seed company, Monsanto along with its local partner Mahyco promoted its BT cotton seeds[1605] with the promise that it would lead to an increase in yield and a reduction in production cost due to lower usage of pesticide required for the seed.[1606] However, contrary to this, farmers that utilized the improved seed failed to retrieve additional income due to the outbreak of a new strain of disease hence requiring increased pesticide usage.[1607]

As already shown, the concentration of agribusiness MNC's in the seed sector has empowered these companies to set a higher price on their seeds, fertilizers, and chemical pesticides.[1608] This connotes that due to the strong market power commodity traders and food processors possess in influencing the price of products, farmers receive low prices for the crops of their production.[1609] This fact further diminishes their economic potential to feed themselves thereby contributing to their indebtedness.[1610] The pressure by the agro-biotechnological sector has mounted to a point where farmers would hardly earn anything from their produce hence forcing some to become agricultural workers on big plantations.[1611] This trend is in

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[1598] Ibid.
[1599] Ibid.
[1600] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 8.
[1601] Ibid, Paragraph 11.
[1602] Chiarolla, "Intellectual Property, Agriculture and Global Food Security," 61-62.
[1603] See, Aoki, "Seed Wars,"; Kloppenburg, & Kienman, "Seed Wars: Common Heritage,".
[1604] For more, see Goodman, "Seeds of hunger,".
[1605] Bacillus thuringiensis is alternatively called BT cotton seeds.
[1606] Devinder Sharma, "Has the Bt bubble burst?," India Together, (7 October 2006). Available at: http://www.indiatogether.org/2006/oct/dsh-btbubble.htm>.
[1607] See, Abdul Qayum and Kiran Sakhari, "Bt Cotton in AP: Fourth successive year of the study reconfirms the failure of Bt Cotton," (2006).
[1608] Peter O'Driscoll, "Part of the Problem: Trade, Transnational Corporations, and Hunger, Center Focus (Mar. 2005); Vandana Shiva, Stolen Harvest: The Hijacking of the Global Food Supply (2000).
[1609] See, Olivier De Schutter, "Report of the Special Rapporteur on the Right to Food, Delivered to the UN General Assembly," UN Special Rapporteur on the Right to Food, UN document A/65/281 (2010).
[1610] See, Olivier De Schutter, "Report of the Special Rapporteur on the Right to Food, Delivered to the UN General Assembly," UN Special Rapporteur on the Right to Food, UN document A/65/281 (2010).
[1611] Ibid.

contravention to the right to adequate food.[1612] This is because as already stated the expensive price set by the private sector for access to GE seeds has weakened farmers' ability to feed themselves directly from productive land thus forcing some to seek employment elsewhere.[1613]

As a consequence, farmers are put in an uncomfortable position where they lose money on the crops they have grown. In turn, this has made them be financially unsound.[1614] Furthermore, as already highlighted, the seeds provided by the private sector are patented which implies that they are sold with restrictions as to their use. The effectiveness of the crops that are sold to farmers, moreover, depends to a large extent on the utilization of expensive agrochemicals (fertilizers, pesticides, herbicides).[1615] This implicates that farmers are forced into buying these agrochemicals if they are to achieve desired results with negative implications on their economic stability as a result of reduced earnings forcing them into cycles of debt.[1616] This contravenes mainly with the "economic accessibility"[1617] dimension of the right to adequate food.

As the preceding section demonstrated, a major factor which has contributed significantly to the restriction put on farmers' access to GE seeds relates to contract agreements (also referred as license agreements) they are required to enter into with seed companies.[1618] Such agreements put strict post-sale contract restrictions on farmers under which they will be duty-bound to return to the same seed company on an annual basis so as to continue the utilization of commercial seeds.[1619] In this regard, seed companies have used two techniques in the contract agreements they have entered with farmers.[1620] Through the first mechanism, a farmers' use of a protected seed is restricted. This is because as per the agreement entered into, farmers are barred from saving, replanting on their own holding while at the same time, being unable from reselling a protected commercial seed outside authorized distribution channels.[1621] This mechanism is typical of the seed manufacturing conglomerate Monsanto's

[1612] The UN Committee on ESCR General Comment 12 (1999): Paragraph 12. Particularly, it goes against the availability dimension of the RTF. Availability is elaborated by the UN Committee on ESCR as, "the possibilities either for feeding oneself directly from productive land or other natural resources, or for well-functioning distribution, processing and market systems that can move food from the site of production to where it is needed in accordance with demand".

[1613] See, Schutter, "Report of the Special Rapporteur on the Right to Food, Delivered to the UN General Assembly,".

[1614]See, O'Driscoll, "Part of the Problem,"; Shiva, "Stolen Harvest,".

[1615] Cordes, "The Impact of Agribusiness Transnational Corporations on the Right to Food in Accounting for Hunger," 31-31 & 45-46; N R.C. Lewontin, "The Maturing of Capitalist Agriculture: Farmers as Proletarian, in Hungry For Profit: the Agribusiness Threat to Farmers, Food, and the Environment," 93, 101 (Fred Magdoff, et al. eds., 2000).

[1616] See, Cordes "The Impact of Agribusiness Transnational Corporations on the Right to Food in Accounting for Hunger," 31-31, 45-46.

[1617] The UN Committee on ESCR General Comment 12 (1999): Paragraph 8.

[1618] See, Moretti, "Tracking the trend towards market concentration," 18-23.

[1619] Ibid.

[1620] United Nations Conference on Trade and Development, "Tracking the Trend Towards Market Concentration: The Case of the Agricultural Input Industry," UNICTAD Secretariat, (2006):19-20.

[1621] Ibid.

technology agreement (MTA).[1622] Other license agreements entered into put a restriction on purchasers from using a protected seed for breeding and research activities.[1623]

As already implied, the privatization of agricultural innovations and proprietary rights assertion by the private sector has transformed farmers' role from that of seed owners to mere licensees of a patented product.[1624] The pressure that is being put on farmers traditional practices has been a result of the profit maximization motive of the private sector (patent holders). This implies that as opposed to farmers, the private sector defines and sets research priorities based solely on profit-making consideration than what is in the public interest.[1625] This is in violation of State's obligation to protect under which every country has the obligation "to regulate activities of individuals or groups so as to prevent them from violating the right to food of others"[1626] depending on those inputs in order to be able to continue to farm. Thus, the private sector by snatching away the independence of farmers in deciding what to and how to produce food has made farmers dependent on the commercial provision of seeds.[1627] This pressure, as such, not only straps the economic stability of farmers but also snatches decision making power from them as regards what to produce and what the modality of production should be.[1628]

Furthermore, another challenge that has been witnessed as regards availability of food has to do with food safety.[1629] As already discussed, availability refers to "...availability of food free from adverse substances, and acceptable within a given culture".[1630] In connection to this, a major problem that has been witnessed as a result of the strengthening power of seed companies has to do with the employment of Genetic Use Restriction Technology (GURTS) also known as technology use agreements/contractual clauses under which seed companies ascertain that farmers return to the same input provider on an annual basis.[1631] GURTs is a term used to describe different forms of controlling the action of genes in plants. The so-called "terminator" technology, which would render a seed sterile so that it is not physically possible to grow a second crop, is a well-known example in this regard.[1632]

[1622] For more, Monsanto Co. v. McFarling, 302 F.3d 1291, 1293 (Fed. Cir. 2002). 26 Litigated in Pioneer Hi Bred Int'l, Inc. v. Ottawa Plant Food, Inc., 283 F. Supp. 2d 101, 1025 (N.D. Iowa 2003).

[1623] See, for example, Pioneer Hi-Bred Int'l Inc. v. DeKalb Genetics Corp., 51 USPQ 1987 (SD Iowa 1999).

[1624] United Nations Conference on Trade and Development, "Tracking the Trend Towards Market Concentration: The Case of the Agricultural Input Industry,", UNICTAD Secretariat," 19-20.

[1625] See, Nyéléni, "Seed Laws That Criminalise Farmers Resistance and Fightback," Nyeleni Newsletter, (2015):4.

[1626] See, the UN Document titled: Substantive Issues Arising in the Implementation of the International Covenant on Economic, Social and Cultural Rights, May 1991, (E/C.12/1999/5): Paragraph 19.

[1627] See, Nyéléni, "Seed Laws That Criminalise Farmers Resistance and Fightback," Nyeleni Newsletter, (2015):4.

[1628] R.C. Lewontin, "The Maturing of Capitalist Agriculture: Farmers as Proletarian, in Hungry for Profit: The Agribusiness Threat to Farmers, Food, and The Environment," (Fred Magdoff, et al. eds., 2000): 93 &101.

[1629] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 10.

[1630] Ibid, Paragraph 8.

[1631] Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 331-333.

[1632] Ibid; Tansey & Rajotte, "The Future Control of Food: A Guide to International Negotiations and Rules on Intellectual Property, Biodiversity And Food Security,".

By so doing, agribusiness MNC's have ensured that farmers return to them for the purchase of seeds or agro-chemicals so as to activate germination in the same plant variety. This characteristic of some hybrids (such as commercial hybrid maize) confers a natural form of protection by which seed companies can more readily capture a return on their investment through repeat seed sales.[1633]

Trends have shown that the employment of GURTs has had a negative effect as a result of contamination.[1634] The effect of contamination with GE seeds has been more pronounced as this contamination will directly affect traditional farmers' varieties (landraces) which for the most part constitute the only means of livelihood and local food provision for smallholder farmers in these countries.[1635] This is because manipulated Deoxyribonucleic acid (DNA) from GE seeds will contaminate traditional landraces (plants that are selected by traditional farmers from wild populations).[1636] Due to the lack of knowledge about the effects of such contamination, however, these farmers are not in a position to take preventive action.[1637] The use of GURTs by MNC's has, however, been halted as a result of public outcry.[1638]

The employment of GURTs contradicts with the right to food , especially, concerning availability which has been elaborated by the CESCR as "availability of food free from adverse substances" (Emphasis added).[1639] The insertion of toxin genetic material into plant varieties (GURTS), hence, infringes upon the right to adequate food and is in violation of the availability dimension of the right to food.

In order to support the aforesaid assertion with practical case, it is pertinent at this stage to look at a legal battle, Monsanto Canada Inc. v. Schmeiser, in order to demonstrate the restrictions that have been put on farmers as a result of contamination with GE seeds.[1640] The case involved a legal battle between Monsanto (that owns a Patent on Canola seeds that contain a gene which transfers resistance to herbicides) and a Canadian breeder of Canola seeds called Percy Schmeiser.[1641] Monsanto's Canola seeds containing the patented gene and cells are then sold as Roundup ready plant which transfers resistance to herbicides. Monsanto after finding out through its on-field investigation that on the field of Schmeiser, 95-98% of the Cancola crop consisted of the Seed Company's Roundup Ready plant, approached the breeder to sign a license agreement with the company and pay license fee.[1642] Schmeiser, however, rejected this offer claiming that he has been a subject of unintentional contamination because of which he is the rightful owner of the seed he had harvested. Following this

[1633] Tobergte R. David, et al., "Integrating Intellectual Property Rights and Development Policy," Report of the Commission on Intellectual Property Rights, 178, (2002):59-60.
[1634] Stephen B. Brush, "Genetically Modified Organisms in Peasant Farming: Social Impact and Equity", 9 IND. J. Global Legal Stud. 135, No. 140 (2001).
[1635] Susan K. Sell, "What Role for Humanitarian Intellectual Property Rights? - The Globalization of Intellectual Property Rights," MINN. J. L. Scl. & TECH. 191, No. 202 (2004).
[1636] Brush, "Genetically Modified Organisms in Peasant Farming,".
[1637] Ibid.
[1638] Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 31-333.
[1639] The UN Committee on ESCR General Comment No. 12 (1999): Paragraph 8.
[1640] See, Cf. Pioneer Hi-Bred Int'l, Inc. v. Ottawa Plant Food, Inc., 283 F. Supp. 2d 1018, 1047-48 (ND Iowa 2003) and Monsanto v. Scruggs, 249 F. Supp 2d 746 (ND Miss 2001).
[1641] Ibid.
[1642] Ibid.

Monsanto brought the case before the Canadian Federal Court on August 6, 1998, claiming that the company has been a subject of patent infringement. [1643]

In his defense, Schmeiser contended that he had been a customer of Monsanto's Roundup Ready Plant and that rather than buying Cancola seeds annually, resorted to saving seeds for replanting the next harvest year. As such, he claimed that in 1998 he used the seeds which he had saved from his crop in 1997.[1644] As the crop he had saved happened to include the Roundup-resistant plant, Monsanto brought the case before the Canadian Supreme Court. However, there was no evidence that the farmer obtained the Canola seed illegally - as was expected - but rather has been a victim of genetic pollution (seed spills from trucks or farm equipment, cross-pollination or seeds carried by the wind from near-by fields). [1645]

In 2004, the Canadian Supreme Court held that even though the seed could have been blown into the field of the defendant by wind, "the farmer had, however, collected, saved, and planted the seeds, eventually cultivating and selling a crop of canola composed mostly of Roundup Ready plants".[1646] As such, in its final decision, the Canadian Supreme Court came to a ruling that the farmer has infringed Canadian Patent Act as, "Canola plants containing a patented gene for herbicide resistance were found on the defendant's fields".[1647] The Supreme Court's decision highlighted that even though Monsanto only had a Patent on a gene (and not on the plant itself), it still possessed a right that extended to the whole plant. This implies that the company had the right to exclude others from growing plants containing the gene. It further held that it was less concerned with “the innocent discovery by farmers of 'blow-by' patented plants on their land" but rather on the continued commercialization of the plant in question. It further ruled that the company would only be eligible to receive the profits Schmeister earned out of the invention.

As highlighted above, this case demonstrates that unintentional contamination with Monsanto's GE seeds has led to an expensive legal battle between Monsanto and Mr. Schmeister in a case which was finally won by Monsanto. The case brought to light - among other things - how the restrictive license agreements farmers enter into with agribusiness companies brings with it a risk of liability even as a result of unintentional contamination with GE crops developed by seed companies. The effect of this has been that farmers have been subject to expensive legal processing while at the same time being unable to sell the seeds in question thereby pushing them out of business.[1648]

When this scenario is looked at in light of the rights enshrined in the ICESCR, this contradicts with the right of everyone to enjoy the benefit of scientific progress and the right to adequate food as embodied in article 11 and its General Comment number 12. The provision among other rights provides the right of everyone to have "... physical and economic access at all

[1643] Ibid.
[1644] Ibid.
[1645] Ibid.
[1646] Ibid.
[1647] Ibid.
[1648] The Center for Food Safety, “Seizing Control: Monsanto's Path to Domination of Biotech Crops and U.S. Agriculture,” in MONSANTO v. U.S. Farmers 8-9.

times to adequate food[1649] or means for its procurement".[1650] The case, however, illustrates how farmers right to adequate food could be restrained as a result of the expensive legal fees (such as liquidation fees) they have to pay resulting from infringement of the license agreements they enter into with agribusinesses which leads them into financial problems thereby restraining the economic access to adequate food or means of its procurement. Furthermore, as Monsanto's claim demonstrated, even though the Patent holder held a Patent on a "gene", it still possessed a right that extends to the whole plant. This implies that Monsanto had the right to exclude third parties (Schmeiser) from using the whole plant. This is in contravention to the physical accessibility to adequate food to farmers as broad Patent claims that extend to the whole plant are increasingly being made thus restraining farmers physical access to their harvest.

It is in recognition of this scenario that the CESCR stresses on "the possibilities either for feeding oneself directly from productive land or other natural resources" (Emphasis added).[1651] Contrary to the human rights obligations imposed on a State, the strengthening of IPRs in plants has, hence, restricted the possibility of farmers "...to feed themselves directly from land or other natural resources".[1652] This directly contravenes with the realization of the right to food of farmers. This is because the granting of strong Patent protection to agribusiness MNC's has brought with it the pressure on farmers (especially those that enter into license agreements) to produce cash crops for export, thus, forcing them to abandon their agricultural production to satisfy their basic needs.[1653] However, due to the increase in land consolidation by these agribusiness MNC's, farmers will lose their access to land which is in violation of their right to food.[1654] This is because restrictions put on farmers access to land is in violation of availability that includes, "the possibilities either for feeding oneself directly from productive land".[1655]

Having looked at how Patent rights as enshrined in Article 27 (3)(b) put restrictions on the enjoyment of the right to enjoy the benefits of scientific innovations, the next section analyzes the restriction on the right to food accruing from PVP.

[1649] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 7. Adequacy is used to refer to foods or diets that are accessible can be considered the most appropriate.
[1650] Ibid, Paragraph 6.
[1651] Ibid, Paragraph 12.
[1652] Ibid.
[1653] See, Cordes, "The Impact of Agribusiness Transnational Corporations on the Right to Food in Accounting for Hunger," 29-32.
[1654] Ibid.
[1655] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 12.

5.1.2.UPOV as a *Sui Generis* System: Another Restriction on the Full Enjoyment of the Right to Food?

The above discussion has shed light on how the realization of the right to food has faced restriction as a result of Patent protection granted to agribusiness MNCs in line with the TRIPS requirement under Article 27(3)(b). Building on this, the discussion below will disclose the main challenges that have resulted from PVP protection under the 1991 Act of UPOV. In so doing, it will examine the restrictions imposed on the right to food the right to science and the.

As already highlighted in the preceding sub-section, UPOV criteria for PVP have been dubbed as less strict compared to Patents, meaning that plant breeders can easily obtain PVP protection for their new plant varieties. This is partly because the requirement of inventive step and industrial application, which are eligibility criteria for Patent are non-existent under the PVP system.[1656] Hence, it can be asserted that UPOV's criteria for protection; distinctiveness, uniformity, and stability (DUS)[1657] are easier to meet than those in patents (under TRIPS). Put differently, plant breeders under UPOV are not obligated to comply with the criteria of non-obviousness (requiring an inventive step) and of utility (industrial applicability).[1658] Hence this implicates that under the UPOV scope of protection, "... no definite amount of human intervention is necessary in order to qualify for protection".[1659] This implies that as long as a plant variety fulfills the DUS requirement, even plant varieties growing in the wild may be eligible for protection. This means that as a result of the DUS criteria which are less restrictive, it has become easier for plant breeders to secure monopoly rights over their varieties while negatively affecting traditional farmers varieties (landraces) which are naturally not uniform and stable.[1660] As such, practices which are deemed vital for the genetic diversity of agriculture are constrained with the principle of uniformity and stability under PVP systems.[1661] This said, however, the DUS criteria for PVP protection, - as already discussed - fail to give due recognition to diverse and incremental innovations mostly common in developing countries.[1662] This is due to the fact that the criteria especially of stability (obtained if a variety remains true to its description after repeated reproduction or propagation),[1663] and uniformity (which implies that a variety remains true to the original in

[1656] See, International Convention for the Protection of New Varieties of Plants, (December 2, 1961), (revised in 1972, 1978, and 1991): Article 27.1; Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.
[1657] See, International Convention for the Protection of New Varieties of Plants, (December 2, 1961), (revised in 1972, 1978, and 1991): Article 5(1).
[1658] Ibid.
[1659] See, Chiarolla, "Commodifying Agricultural Biodiversity and Development-Related Issues," 28-30.
[1660] See, Miranda Forsyth and Farran Sue, "Intellectual Property and Food Security in Least Developed Countries," Third World Quarterly 34, No. 3 (2013): 516–33; Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 316-318.
[1661] Leskien & Flitner, "Intellectual Property Rights and Plant Genetic Resources,".
[1662] See, Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350; Chiarolla, "Commodifying Agricultural Biodiversity and Development-Related Issues," 29; Schutter, "Seed Policies and the Right to Food," 13-14.
[1663] See, International Convention for the Protection of New Varieties of Plants, (December 2, 1961), (revised in 1972, 1978, and 1991):9.

its relevant characteristics when propagated)[1664] would automatically kick out farmers varieties (landraces) which are by their very nature unstable and non-uniform.[1665]

As such, the UPOV acts do not give recognition to the incremental process through which farmers have for millennia undertaken agricultural innovations.[1666] For this reason, countries which are members of UPOV or those that have designed UPOV- compliant *sui generis* system of protection (as per article 27(3)(b) of the TRIPS agreement) would face difficulty in incorporating farmers varieties in their PVP application/legislation.[1667] This poses a marked challenge on State's ability to realize the right to food because the conditions for protection under UPOV- as already discussed - threaten genetic diversity in agriculture due to the emphasis on commercially known varieties over which knowledge has already developed.[1668] Hence, the promotion of genetic uniformity - a typical feature of the modern agro-biotechnological industry - threatens the realization of the right to food.[1669] This is because the DUS criteria restrict the full enjoyment of the right to food as it goes against the availability of adequate food.[1670]

By eliminating farmers' traditional varieties (which fail to meet the DUS criteria) from the scope of protection, the agro-biotechnological sector has threatened farmers' seed system which has helped farmers throughout the years to be economically independent and maintain resilience in the face of changes to climate, soil, and diseases.[1671] This poses a challenge to the enjoyment of the economic accessibility (or the right to food in general) because farmers have been pressured to abandon their traditional varieties in place of commercial varieties which are not suited to the local agro-ecological conditions.[1672] In this regard, even though these modern seeds, which are the result of scientific progress, could be relevant, the fact that access to these modern seeds requires farmers to pay more (less affordable, in short) may restrict the full enjoyment of the right to food.[1673]

Moreover, PVP protection threatens the accessibility of food because it narrows the avenue for the public to enjoy such accessibility in ways that do not interfere with the enjoyment of other human rights.[1674] Hence, the prioritization of uniform varieties by the agro-biological

[1664] Ibid, Article 8; Barry Greengrass, "The 1991 Act of the UPOV Convention" European Intellectual Property Review 466, (1991).
[1665] See, Chiarolla, "Comodifying Agricultural Biodiversity and Development-Related Issues," 28-30; Louwaars et al., "Seed Systems and Plant Genetic Resources for Food and Agriculture,"; GRAIN, "Seed laws that criminalize farmers," 10.
[1666] Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.
[1667] See Carlos M. Correa, "Implementing Farmers' Rights Relating to Seeds," South Center Research Paper 75. (2017).
[1668] Olivier De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.
[1669] See, Chiarolla, "Intellectual Property, Agriculture and Global Food Security," 61-62.
[1670] The UN Committee on ESCR General Comment 12 (1999): Paragraph 12.
[1671] See, Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 312-313.
[1672] Ibid.
[1673] P.H Howard, "Intellectual property and consolidation in the seed industry," Crop Science 55, (2015):1-7.
[1674] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 8.

sector has undermined agricultural biodiversity and by so doing has impeded on farmers' livelihood hence constraining their ability to realize other basic human rights.[1675] For example in Ethiopia in 2017, two varieties of durum wheat have been discovered by researchers at Bioversity International.[1676] These varieties of wheat are peculiar in that they have not previously been placed on the market and because of their high yield potential, especially in dry and marginal areas. This discovery has opened the door for further breeding to be conducted so as to produce "superior durum wheat crops using these high-performing traditional seeds, to help buffer farmers against recurring droughts and combat hunger in the region".[1677] This highlights that traditional farmers varieties, such as the newly discovered durum wheat, are important means for maintaining agricultural biodiversity. However, under the guise of PVP protection, agribusiness MNC's have restricted farmers' access to seeds and related knowledge.[1678] This puts into question the future sustainability of agriculture which is in contravention to the obligation on the Member States to ensure the sustainable accessibility of adequate food.[1679] This is because farmers should entertain some form of control over plant varieties so that they will be able to improve varieties which respond well to changing circumstance (climate change, diseases, soil).[1680]

The 1991 UPOV Act has put further restrictions on the afore-discussed farmers varieties. This is because, firstly, the 1991 Act of UPOV has watered down one of the exceptions provided under UPOV 1978, *inter alia*, the farmers' privilege by making it an "optional exception".[1681] This implies that states now have the discretion in deciding whether to include this exception in their PVP legislation. Hence, given its optional character,[1682] States could choose to deny the farmers' privilege in total or incorporate it subject to different conditions such as payment to a plant breeder in case farmers have used farm-saved seeds.[1683]

Moreover, as already discussed in the above sections, farmers are no longer able to exchange or sell varieties which they have harvested on their land as per the requirements of the 1991 Act.[1684] Even though the agreement provides for limited exception as regards acts done privately or for non-commercial purposes, acts done for the purpose of breeding other varieties (breeders' exception) and acts done for experimental purposes, the farmers privilege

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[1675] See, United Nations Development Programme, "Towards a Human Rights-based Approach to Food Security: A Self-Assessment Tool to Achieve Balanced Plant Regimes: Facilitating Farmers' Participation to Ensure Sustainable Access to Food", (New York: 2012); Braunschweig, et al., "Owning Seeds, Accessing Food," 11-14.

[1676] For more see, https://www.theguardian.com/uk/environment, Accessed on 26/September/ 2017.

[1677] Ibid.

[1678] Cullet, "Intellectual Property Rights and Food Security in The South," 261.

[1679] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12(1999): Paragraph 8.

[1680] FAO, Rome declaration on World Food Security and World Food Summit Plan of Action, (Rome: Food and Agriculture Organization, November 13, 1996): Objectives 3(1) and 3(4)(d).

[1681] See, International Convention for the Protection of New Varieties of Plants, (December 2, 1961), (revised in 1972, 1978, and 1991): Article 15(2).

[1682] Ibid. This is unlike the right granted to breeders (the breeders' exception) which is mandatory as provided for under Article 15(1)(iii) of the 1991 act.

[1683] See, Correa, "Implementing Farmers' Rights Relating to Seeds,".

[1684] International Convention for the Protection of New Varieties of Plants, (December 2, 1961), (revised in 1972, 1978, and 1991): Article 15(2); Watal, "Intellectual Property Rights in the WTO and Developing Countries," 141.

is covered as an optional exception in the 1991 Act which only allows for limiting breeders right for the sake of permitting, "farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety".[1685] As already highlighted above, this provision marks a clear departure from the 1978 UPOV Act in which the farmers' privilege included the right to use a variety as an initial source of variation for the purpose of creating other varieties or for the marketing of such varieties without requiring an authorization from the breeder.[1686] The breeders' authorization was deemed important only when "the repeated use of the variety is necessary for the commercial production of another variety".[1687]

In the 1991 Act, however, this is further restricted for one because it is only those countries which have enacted the Optional Protocol[1688] that have the right to allow the re-use and re-sow of varieties on their own holdings hence restricting further the farmers' privilege. Moreover, the provision only allows farmers to use seeds on their own holding (where it was obtained).[1689] This restriction, as such, has eliminated the possibility of farmers to engage in the exchange and sell of seeds locally which mainly impedes on their economic accessibility of the right to adequate food.[1690] In this regard, a recent study has shown that such informal farmers' networks are important means of local seed exchange needed for sustainable agriculture.[1691]

Furthermore, the implementation of the provision on farmers' privilege should be exercised in the 1991 Act "within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder".[1692] As such, the conditions under which the farmers' privilege has to be exercised in the 1991 Act, puts further restrictions on farmers in that it grants States the right in determining reasonable limits as far as the extent of the right to be exercised (acreage, quantity of seed and species) while the requirement to "safeguard the legitimate interests of the breeder" has been interpreted as requiring the payment of additional remuneration to the breeder.[1693] This has posed a significant challenge on farmers' that are required to pay the additional payment.

[1685] International Convention for the Protection of New Varieties of Plants, (December 2, 1961), (revised in 1972, 1978, and 1991): Article 15.2.
[1686] Ibid, Article 5(3).
[1687] Ibid.
[1688] The optional exception (Farmers privilege) applies to "crops where, for the member of the Union concerned, there was a common practice of farmers saving harvested material for further propagation". See, International Union for The Protection of New Varieties of Plants, Guidance for the Preparation of Laws Based on the 1991 Act of The UPOV Convention, Upov/Inf/6/3, (2013).
[1689] Ibid.
[1690] See, Correa, "Implementing Farmers' Rights Relating to Seeds,"; United Nations Conference on Trade and Development, "Tracking the Trend Towards Market Concentration: The Case of the Agricultural Input Industry," 17; Correa, "Intellectual Property Rights, The WTO and Developing Countries,".
[1691] For more, see Oliver T. Coomes et al. "Farmer seed networks make a limited contribution to agriculture? Four common misconceptions", Food Policy, vol. 56 (October 2015): 47.
[1692] UPOV 1991, article 15(2).
[1693] See, International Union for the Protection of New Varieties of Plants, Guidance for the Preparation of Laws Based on The 1991 Act of the Upov Convention, Upov/Inf/6/3.(2013); Sivakumar, Mannava V.K., and Motha, Raymond P. "Managing Weather and Climate Risks in Agriculture," FIS/ASSINSEL. 2001a, 2001, Position Paper (2007).

The recent strengthening of the 1991 UPOV Act has furthermore restrained the availability and access to plant genetic material to innovators. This goes against the very purpose of the UPOV Acts (1978) which seeks to protect breeders right by making freely available both the protected and primary material.[1694] This is because the UPOV's scope of protection was developed with the intention of curtailing the possibility that access to plants would be blocked by a Patent holder in jurisdictions that use Patent protection.[1695]

However, as already mentioned above, the 1991 Act of UPOV has undermined this possibility. This is because it has strengthened the protection[1696] to be given to original plant breeders such that breeder's authorization is deemed important for the conduct of a number of acts.[1697] This connotes that besides the acts of production of the variety's propagating materials for purposes of commercial marketing, the offering for sale of such materials, and the marketing of the material,[1698] the 1991 UPOV Act has made the authorization of the breeder a requirement for the purposes of "...reproducing the protected variety, conditioning it for propagation, offering for sale, exporting and importing the variety, and stocking for any of these purposes".[1699] Moreover, the number of acts which deem the original breeders' authorization has been extended to include not only the reproductive or vegetative propagating material but also encompass harvested material obtained through the illegitimate use of propagating material and so-called essentially derived varieties.[1700] This implies that the 1991 Act of UPOV has introduced significant changes in the provisions such that a breeder wanting to breed new varieties based on a protected variety is now required to seek authorization from the original breeder.[1701] This, in essence, is contrary to the purpose of the UPOV Acts (1978) which is based on making available to breeders protected propagating material so that they could engage in further breeding.

The restriction which has been imposed on breeding activities, however, does not end here. This is because, as already highlighted earlier, the 1991 UPOV Act has removed the ban on dual protection as provided for in the 1978 Act.[1702] By doing so, it has permitted Member States to grant both Plant Breeders' Right (PBR)[1703] as well as patents.[1704] The inclusion of this provision in the 1991 Act puts a constraint on future research as Patent protected varieties - as highlighted above - cannot be used by others wanting to develop new varieties.[1705] This highlights a point already presented in the afore discussion related to the problem of over-patentability in which broad overlapping claims for protection are being made by

[1694] This is the "breeders exception" as incorporated under article of the 1978 Act 5(3) and Art 15(1) of the 1991 Act.
[1695] Tansey & Rajotte, "The Future Control of Food: A Guide to International Negotiations and Rules on Intellectual Property, Biodiversity and Food Security,".
[1696] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991): Article 19.
[1697] Ibid, Article 14(2).
[1698] Ibid, Article 5(1).
[1699] Ibid, Article 14
[1700] Ibid, Article 14(5).
[1701] Ibid, Article 14(2).
[1702] Ibid, Article 2(1).
[1703] Alternatively, also known as plant variety protection (PVP).
[1704] Watal, "Intellectual Property Rights in the WTO and Developing Countries," 149.
[1705] Goodman, "Seeds of hunger,".

agribusinesses[1706] aided by the conviction that it provides an incentive for the continuity of innovations. As such, the removal of the ban on dual protection in the 1991 Convention could further restrict access to genetic material as well as research tools (specifically when a plant variety is protected by patent) could further impede on the continuation breeding activities. This may have an effect on the realization of the right to food as it constrains the possibility of innovators and breeders to develop better plant varieties as well as new technologies so that States will be in a position to realize their obligations under Article 11 of the ICESCR.

At this stage, it is worthwhile noting that, even though Article 27(3)(b) of TRIPS provides PVP through *sui generis* (such as through the UPOV Convention) and Patent system, the agreement provides some forms of flexibilities on the basis of which Member States to the WTO might be able to limit the exclusive rights given to original plant breeders. However, the relevant question which might be asked in this regard is whether the flexibilities provided in a position to limit Patent holder's exclusive right and thereby ensure the right to food? The subsequent section of this research looks at the flexibilities provided in order to demonstrate whether or not the flexibilities are fully utilizable in order to ensure the realization of the right to food.

[1706] See, John H. Barton & Peter Berger, "Patenting Agriculture," Issues in Science and Technology (2001), Available at: http://www.nap.edu/issues/17.4/p_barton.htm); United Nations Conference on Trade and Development, "Tracking The Trend Towards Market Concentration: The Case of the Agricultural Input Industry, 22-23.

5.8. TRIPS Flexibility: A Constrained Potential to Realize the Right to Food?

As has already been discussed thus far, the current IPRs regime, *inter alia*, the TRIPS Agreement, and UPOV Convention, provide some flexibilities as regards the obligations they impose on the Member States. Taking into consideration the afore-discussed restrictions that have been imposed as a result of strong exclusive rights granted to Patent holders in plant-related inventions, it is vital to look into the flexibilities that States may utilize to ultimately minimize the ramification of exclusive rights on the right to food.

It is vital to recognize at this point that the flexibilities provided under UPOV's PVP system are more relaxed than those available under the TRIPS Agreement.[1707] This is due to the fact that the main purpose of IP protection under both systems differs considerably as already highlighted in the afore discussions. The TRIPS Agreement provides certain exceptions on the basis of which the Member States may be able to ensure the realization of the right to food. Of the flexibilities provided, the first is enshrined under Article 7 of the agreement. In this regard, Article 7 provides,

> "The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations".[1708]

A thorough look into the provision demonstrates that aside from the exclusive protection provided to rights holders, the protection and enforcement of the exclusive right given to Patent holders should also aim at balancing competing interests,[1709] which among others include the interests of the larger society. In particular, the phrase, "the protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology" may imply that the content of the provision makes an implicit link to the right of everyone to benefit from scientific progress as enshrined in Article 15(1)(b) of the ICESCR.[1710] Under this context, accessibility, which fosters access to the benefits of science by everyone, without discrimination,[1711] might be used to balance the exclusive rights created through Article 27(3)(b) of the TRIPS Agreement. As such, the TRIPS provision synopsizes, at a first glance, the need to strike a balance between the gains of producers and users of scientific innovations.

Aside from Article 7, the Agreement also provides additional flexibility under Article 8. It provides that,

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[1707] This is because UPOV's Acts (1978, 1991) provide for exceptions to the exclusive right granted to plant breeders. Specifically, the 1991 Act allows for a research exemption for breeders for acts done privately, non-commercial activities and those done for experimental purposes, For more see UPOV 1991, article 15.2.

[1708] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 7.

[1709] Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 335.

[1710] The United Nations General Assembly, "International Covenant on Economic, Social, and Cultural Rights," (1966): Article 15(1)(b).

[1711] See, Human Right Council, Report of the Special Rapporteur in the field of Cultural Rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, A/ HRC/20/26, (14 May 2012).

> "Members may, in formulating or amending their laws and regulations, **adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance** to their socio-economic and technological development"(Emphasis added).[1712]

Similar to Article 7, Article 8 of the TRIPS allows room for a State to take into account its basic needs and for the promotion of public interest in sectors of importance.[1713] Beyond the aforesaid exception, the utilization of compulsory license has also been cited as a means through which members may be able to overcome the exclusive rights created under Article 27(3)(b) of the TRIPS Agreement.[1714] Particularly Article 31 (compulsory license) of the TRIPs Agreement could be employed so as to ensure access to research results which are restricted as a result of Patents.[1715] For instance, when such restriction on research results put a restriction on food security or put an obstacle during periods of national emergency[1716], the agreement may allow for the "...use of the subject matter of a Patent without the authorization of the right holder".[1717]

Even though, it might be concluded from the aforesaid section that notwithstanding the exclusive rights given to right holders, the TRIPS provisions provide mechanisms that might be of help to overcome the restriction imposed on the realization of the right to food, there are a number of factors that support the assertion that the said flexibilities may contribute less as regards the realization of the right to food. Put differently, although a number of flexibilities are provided as exceptions to Article 27 in general and in Article 27(3)(b) in particular, the provision has so far continued to be less relevant as regards ensuring the right to food.

An explanation for this could accrue from a multitude of factors. Firstly, in spite of the prevailing flexibilities, as provided, a State's endeavor to ensure its core obligation may be subjected to considerable hurdles. It is evident that a State Party to the ICESCR has progressive as well as core obligations concerning the realization of the right to food as discussed under chapter two of the research.[1718] While a progressive State obligation requires a State to take steps gradually towards the full realization the right to food, the core obligation, which implies the right of everyone to be free from hunger, obliges a State to take necessary steps immediately.[1719] This entails that as part of such core obligations, a State has the right "to take the necessary action to mitigate and alleviate hunger".[1720] The utilization of necessary actions or measures as incorporated in Article 11 of the ICESCR as such should not be constrained as States are required to carry out, particularly, their core obligation

[1712] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 7.
[1713] Ibid, Article 8.
[1714] Ibid, Article 27(3)(b).
[1715] Ibid, Article 31.
[1716] Taylor & Cayford, "Biotechnology Patents and African Food Security," 277 Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 29.
[1717] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 31.
[1718] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): 14 &16.
[1719] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990).
[1720] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 6.

immediately.[1721] Even though international human rights instruments require countries to take all necessary measure, States' endeavor to rely on the TRIPS flexibilities to ensure such core obligation may not always enable a State to fully realize the core obligation inserted under the fundamental human rights instruments. This is because, as discussed above, despite the inclusion of flexibilities, the flexibilities are subject to pass through a consistency measure test so as to ascertain their viability.[1722]

This denotes that in order for a State to rely on the TRIPS flexibilities so as to ensure the right to food, any measure to be taken by a State Party on the basis of such flexibilities must be consistent with the spirit and objective the TRIPS Agreement. Particularly, Article 8(1) of the TRIPS Agreement provides that the Member States may, in formulating or amending their laws and regulations, adopt measures necessary to "**protect nutrition, and to promote the public interest in sectors of vital importance** to their socio-economic and technological development"(Emphasis added).[1723] The agreement, however, further provides that, the provision of such measures or flexibilities may be allowed "provided that such measures **are consistent with the provisions of the TRIPS Agreement**" (Emphasis added).[1724] In addition to this, Article 8(2) of the agreement further ascertains the limited scope of the action to be taken by a State as it provides the fact that States appropriate measures "**provided that they are consistent with the provisions of this Agreement**, may be needed to prevent the abuse of intellectual property rights by right holders" (Emphasis added). This entails that even though a State is given the discretion to limit the exclusive rights of the right holders to promote its duties in relation to the realization of the right to food, States' right to do so is conditioned upon a further prerequisite requiring such measures to be in line with the overall spirit of the agreement. A close inspection into the human rights instruments, however, demonstrates the absence of such conditions (consistency) as it imposes stronger obligations on a State Party to human rights instruments. It rather requires each country to "take whatever steps are necessary to ensure that everyone is free from hunger" so that everyone can enjoy the right to adequate food as soon as possible.[1725] Thus, in order to ensure freedom from hunger, a State Party should not be prohibited under any condition, including as part the consistency required, from taking the necessary measure that can be of help to ensure the core minimum obligation.[1726] It is in recognition of this rights that the CESCR stipulates that "**any intellectual property regime that makes it more difficult for a State to comply with its core obligations in relation to food**, especially, or any other right set out in the Covenant, **is inconsistent with the legally binding obligations of the State party**"(Emphasis added).[1727]

[1721] United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990).
[1722] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994).
[1723] Ibid, Article 8.
[1724] Ibid.
[1725] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 21.
[1726] Ibid, Paragraph 19.
[1727] See, UN Committee on ESCR "Human Rights and Intellectual Property: Statement by the Committee on Economic Social and Cultural Rights", UN doc. E/ C.12/2001/15 (2001): Paragraph 12; Joseph, Blame it on the WTO?: A Human Rights Critique, 219.

In this regard, even though, it can be argued that Article 27(3)(b) or the TRIPS Agreement, in general, is fit to take into account competing interests (Patent holders and public interest), the consistency requirement enshrined under Article 8 may, however, clash with the very rights and obligations enshrined under Article 11 of the ICESCR.[1728] This is because the exceptions as provided for under Article 8 (1&2) stipulate that the measures to be taken by a State are to be admissible only when they are in conformity with TRIPs agreement. This moreover makes the provision subject to either a narrow or wider interpretation[1729] hence restricting further the option available for the Member States to utilize the exception.[1730] It also highlights that the conditional nature of the exception as provided in Article 8, by making the utilization of the exception subject to be consistent with the TRIPS agreement, the agreement may put limits on a state's ability to implement, particularly, its core obligation.[1731]

As such, a core obligation, which imposes strong duties on a state, is not normally conditioned upon other factors (such as consistency) as States have a limited room to justify their failure to fulfill such obligations.[1732] In order for a State to be able to carry out this obligation, international human rights law requires States to take all necessary measures.[1733] On the contrary, Article 8 of the TRIPS provides that the necessary measures can only be taken so long as they are not inconsistent with the TRIPS Agreement.[1734] In this regard, the failure of a State to take the necessary measure under the guise of the consistency requirement might be in contravention of the rights as contained under the Covenant including the right to food.[1735] This is because a State's failure (omission to use the Covenant's terminology) to take the necessary steps while it is able to do so is tantamount to a violation of the right to food as enshrined under article 11 of the ICESCR.[1736]

Henceforth, based on this consideration, it can be argued that the consistency measure as provided for under Article 8, risk to limit a State's ability to fulfill the essential core obligation of the right to food; freedom from hunger.[1737] Under this context, subjecting the measures to be taken to a consistency test[1738] as required under Article 8 of TRIPS puts a restriction on a State's right to realize its core obligation. Given the fact that the core obligations of a State exact an immediate obligation, a State's failure to "ensure the satisfaction of, at the very least,

[1728] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999).
[1729] Josef Drexl et al., "TRIPS Plus 20: From Trade Rules to Market Principles," Vol 25, Springer Vol. 25, (2016):28-29.
[1730] Cullet, "Food Security and Intellectual Property Rights in Developing Countries," 22.
[1731] The Core obligations imply that governments "no matter what level of resources are at their disposal, are obligated to make sure that people living under their jurisdiction enjoy at least essential levels of protection of each of their economic, social, and cultural rights".
[1732] See, the UN Committee on ESCR, General Comment No. 12 (1999): Paragraph 17.
[1733] See for example, United Nations Committee on Economic, Social and Cultural Rights (CESCR), "General Comment No. 3 (1990).
[1734] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 8.
[1735] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 19.
[1736] Ibid.
[1737] Ibid, Paragraph 14.
[1738] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 8(1&2).

the minimum essential level required to be free from hunger" may give rise to a violation of the right to food.[1739]

Beyond Article 8, a closer look into Article 27 also supports the argument raised in the preceding paragraph. It is evident that Article 27(1, 2 & 3) provide for exceptions in which States are granted the discretion to exclude Patent protection.[1740] Particularly, Article 27(2) allows for the exclusion from patentability of inventions, "... the commercial exploitation of which is necessary to protect the ordre public or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment".[1741] Similar to Article 8, this flexibility is, however, conditioned on the premise that the "...exclusion is not made merely because the exploitation is prohibited by their law".[1742] Hence, the provision by making the exclusion of certain inventions allowable given their commercial exploitation is "necessary", limits its scope of the application.[1743] This connotes that Article 27(2) requires the State party seeking exclusion of inventions on grounds of "ordre public or morality" to prove that such exception is necessary.[1744] As such, this implies that due to its limited scope, Article 27(2) can be of use only in limited cases where a State has been able to effectively demonstrate "necessity".[1745] Hence, it can be employed in a limited number of circumstances.[1746]

Additionally, Article 30 of the agreement could be of further support to the argument raised above. This is because Article 30 grants options to a State as to the choice of what is to be protected in their national IPRs laws.[1747] Even though a limited exception is accorded to members under Article 30, the exception is contingent upon the fact that "such exception **does not unreasonably conflict with a normal exploitation of the Patent and does not unreasonably prejudice the legitimate interests of the patent owner**, taking account of the legitimate interests of third parties"(Emphasis added).[1748] This provision as such restricts State Parties from adopting substantive exceptions like those found in PVP laws of UPOV Signatory States.[1749]

As a consequence, it can be argued that the flexibilities provided under the TRIPs agreement are stated as exceptions to the rule rather than being guiding principles on their own right.[1750]

[1739] See, the UN Committee on ESCR, General Comment No. 12 (1999): Paragraph 17.
[1740] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27 (1, 2 & 3).
[1741] Ibid, Article 27(2).
[1742] Ibid, Article 8.
[1743] See, Leskien and Flitner, "Intellectual Property Rights and Plant Genetic Resources," 15.
[1744] Ibid. "Necessary" has been interpreted in the context of Art. XX (d) by a GATT panel which stated that "a measure is not "necessary" if an alternative measure which a state could reasonably be expected to employ and which is not inconsistent with other GATT provisions is available".
[1745] See, Correa, "TRIPS-Related Patent Flexibilities and Food Security: Options for Developing Countries," 8.
[1746] Ibid.
[1747] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 30.
[1748] Ibid; Boettiger, Graff et al., "Intellectual Property Rights for Plant Biotechnology: International Aspects,' in Paul Christou and Harry Klee (eds.), Intellectual Property Rights for Plant Biotechnology: International Aspects. Handbook of Plant Biotechnology, (John Wiley and Sons, Chichester:2004):1093.
[1749] Helfer and Austin, Human Rights and Intellectual Property: Mapping the Global Interface, Cambridge University Press, 388.
[1750] See, A. Gupta, "Patent Rights on Pharmaceutical Products and Affordable Drugs: Can TRIPS Provide a Solution?," Buff. Intell. Prop. L. J. 2, (2004):132.

This is shown by the fact that the exceptions have been subject either to be consistent with the provisions of the agreement or that they do not prejudice the legitimate interest of the Patent holder.[1751] This fact may put restrictions on a State as it restrains the utilization of more substantive policy measures.[1752] In this context, it is worth noting that subjecting the right to food to a consistency requirement demonstrates that the main objective of Article 27 is the promotion of innovation via the provision of commercial incentives.[1753] As such, even though the agreement provides flexibilities, the exceptions, as highlighted above, are incorporated as exceptions to the rule instead of being the guiding principles on their own.[1754]

Beyond the aforesaid points, there are other extralegal reasons that have made the utilization of the TRIPS flexibilities less effective. As already highlighted, WTO Member States are required to provide protection for plant varieties.[1755] This requirement, moreover, gives States the discretion as to the modality to be chosen for PVP: Patent, effective *sui generis* system or a combination of both.[1756] Although the provision impliedly gives a broad discretion as regards the modality of protection, practice, however, shows that it has not been utilized effectively by developing country MS to the agreement.[1757] Only a handful of countries have adopted national *sui generis* systems that fit their national contexts, while other countries - have been pressured into striping their PVP legislation as a result of bilateral agreements and other factors.[1758] This has been due to the pressure that is being put by developed countries and their agribusiness MNCs' to ratchet up the level of IPRs protection so as to enhance their monopoly in the seed market.[1759] More specifically, developing countries have not been able to effectively reap their interests out of the flexibility provided under Article 27(3)(b) for various reasons. For one, this is because of their consideration that the development of a national *sui generis* system is a "cumbersome task whose immediate benefits may not be apparent in particular where the adoption of the UPOV regime constitutes an existing alternative that is not contentious".[1760] This relates to a point already discussed in the above sections, that the lack of definition in the TRIPS Agreement as regards the constituting elements for the adoption of an effective *sui generis* system has created lack of clarity on developing countries.

[1751] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 8 and 30.

[1752] See, Tilahun Hindeya, "TRIPS, Plant Varieties and the Right to Food: A Case Study of Ethiopia's Legal Regime on Protection of Plant Varieties," (July 23, 2014): 87-90.

[1753] Report of the High Commission of the Human Rights Commission, "The Impact of the Agreement on Trade-Related Aspects of Intellectual Prop. Rights on Human Rights," T 20-28, U.N. Doc. E/CN.4/Sub.2/2001/13 (2001).

[1754] Ibid.

[1755] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article (3)(b).

[1756] Ibid.

[1757] Correa, TRIPS-Related Patent Flexibilities and Food Security.

[1758] For example, Costa Rica has been forced to dismantle its national sui generis system due to pressure to adopt UPOV's 1991 Act in Bilateral Investment Agreements it has entered with the U.S. See, Zoë Goodman, "Trade Human Rights Equitable Economy, Seeds of Hunger: Intellectual Property Rights on Seeds and the Human Rights Response," (2009):6-7.

[1759] Aziz Choudry, "Corporate Conquest Global Ge0politics, Intellectual property rights and bilateral investment agreements," GRAIN, (2005).

[1760] Philippe Cullet, "Food Security and Intellectual Property Rights in Developing Countries," ELRC Working Paper, International Environmental Law Research Center (2009): 22.

Moreover, developing countries have not been able to explore their options under 27(3)(b) because *they lack the technical, financial as well as legal capabilities to develop their own sui generis system which is in accordance with their national priorities*.[1761] For this reason, the introduction of national *sui generis* system has required the provision of technical advice to developing countries.[1762] However, as part of the technical advice given, developing country members of the WTO, are being directed into adopting the 1991 Act of UPOV as a model law to fulfill their TRIPS obligation (Art 27(3)(b)).[1763] The technical advice provided to them by these bodies includes recommendations to adopt UPOV compliant legislation. Such advises provided, however, fail to give due recognition to the specific needs and priorities of developing countries as regards the realization of their priorities, such as the right to food.[1764] This is because as already attested in the earlier sub-sections, evidence has shown that the adoption of UPOV compliant legislation as an effective *sui generis* system has failed to stimulate research pertaining to the needs of developing countries. This is so because the UPOV's PVP legislation has been designed to promote the interests of the commercial sector in developed countries.[1765]

In this regard, it is important to bear in mind that the UPOV Secretariat and World Intellectual Property Organization (WIPO) - which has been authorized by the WTO to help developing countries meet their TRIPS commitments - have been providing assistance based on UPOV consistent model laws.[1766] As such, by recommending UPOV compliant legislation, the technical advice provided by these bodies has failed to inform developing countries about the different options they have at their disposal as regards the adoption of an effective *sui generis* system which is in compliance with their specific needs and interests.[1767] Moreover, the technical advice provided by developed countries even in bilateral agreements has often promoted the adoption of UPOV consistent legislation.[1768]

An additional reason why developing countries have been less effective in designing national *sui generis* system is a result of Bilateral and Multilateral Trade and Investment Agreements (simply, TRIPS Plus Agreements) they have entered into with developed countries. This is because developed countries are ensuring that more stringent IPRs protections are adopted in their Bilateral Investment Agreements (BITs) and Free Trade Agreements (FTAs).[1769] They have done so with the intention of protecting the interest of their corporations.[1770] The

[1761] Goodman, "Trade Human Rights Equitable Economy, Seeds of Hunger," 6-7.
[1762] See, Schutter, "Right of everyone to benefit from scientific innovations and the right to food," 15.
[1763] GRAIN, "Bilateral Agreements Imposing TRIPS-Plus Intellectual Property Rights on Biodiversity in Developing Countries," (Mar. 2008); South Centre Analytical Note, "Intellectual Property in Investment Agreements: The TRIPS-plus Implications for Developing Countries," South Centre, SC/TADP/AN/IP/5, (May 2005).
[1764] Goodman, "Trade Human Rights Equitable Economy, Seeds of Hunger," 6-7.
[1765] Commission On Intellectual Property Rights, "Integrating Intellectual Property Rights and Development Policy," Executive Summary 63, (2002).
[1766] Goodman, "Trade Human Rights Equitable Economy, Seeds of Hunger," 6-7.
[1767] Ibid.
[1768] Ibid.
[1769] See, Carlos M. Correa, "Bilateral Investment Agreements: Agents of new global standards for the protection of intellectual property rights?," GRAIN (2004); Peter Draho, "BITS and BIPS: Bilateralism in Intellectual Property," The Journal of World Intellectual property, (2001).
[1770] For more on the TRIPS Plus BITS and FTAs. See, Carlos M. Correa, "Bilateral Investment Agreements,"; Draho, "BITS and BIPS: Bilateralism in Intellectual Property,"; P. Yu, "Intellectual Property at a Crossroads:

pressure for the adoption of stringent IPRs is a byproduct of the need to narrow down the flexibilities, provided under TRIPS such as Article 27(3)(b).[1771] This would highly narrow down the policy space provided for State Parties to introduce a *sui generis* system which is in line with their international commitments as well as national priorities. This will highly jeopardize the State's ability to realize the right to food.

In this regard, as part of their treaty obligations in BITs and FTAs, developing nations have faced pressure to adopt higher standards specifically for plant variety protection (PVP).[1772] This implies that contrary to the provisions of the TRIPS Agreement, whereby no reference is made to pre-existing forms of *sui generis* protection, TRIPS plus agreements authorize UPOV 1991 as the chosen system of protection to plant breeders.[1773] This pressure on its own conflicts with the TRIPS flexibility as provided for under Article 27(3)(b).[1774] Particularly, TRIPS plus agreements have been instrumental for developed country MNCs in that through the pressure they exert on key government officials, it has allowed them to maximize their profit margins.[1775] Agribusiness MNCs, such as Monsanto have managed to exert influence through strong lobbying of government officials with the intention of maintaining their agricultural dominance.[1776] Hence, the introduction of BITs and FTAs, have been important means by which seed companies like Monsanto and Syngenta have ensured their control over the seed industry. As already discussed, such monopoly power by Agribusiness MNCs has enabled them to push farmers out of their traditional practices of seed saving, re-use, and exchange. This has allowed these companies to maximize their benefit.[1777] Thus, it can be attested that TRIPs plus agreements have been instrumental in pushing for the privatization of seeds in the world.[1778]

By so doing, such agreements restrain the policy space provided under Article 27(3)(b) of the TRIPs Agreement for States to develop their IPRs system which is in accordance with their national priorities hence enabling them to remedy their policy objectives which are in tension with IPRs.[1779] Building on this point, the Special Rapporteur on the Right to Food states that,

> "No State should be forced to establish a regime for the protection of IP rights which goes beyond the minimum requirements of the TRIPs Agreement: free

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The Use of the Past in Intellectual Property Jurisprudence: Currents and Crosscurrents in the International Intellectual Property Regime," Loy LAL Rev, 323, (2004):6.

[1771] South Centre Analytical Note, "The TRIPS-plus Implications for Developing Countries," 5.

[1772] See for example, Correa, "Plant Variety Protection in Developing Countries: A Tool for Designing a Sui Generis Plant Variety System," 40-44.

[1773] For example, Article 1701(2) of the North American Free Trade Agreement (NAFTA), required the State Parties (which at the time did not accede to it), to make all efforts so as to accede to the 1978 or 1991 Acts of UPOV. NAFTA, The North American Free Trade Agreement: A Guide to Customs Procedures, Washington, D.C: Department of Treasury, U.S. Customs Service: (Supt. of Docs., U.S. G.O.P. Distributor), 19994.

[1774] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(3(b).

[1775] See, GRAIN, "UPOV 91 and other seed laws: A Basic primer on How Companies Intend to Control and Monopolize Seeds," (2015).

[1776] Ibid., 27 ff.

[1777] Ibid, 4-5.

[1778] Ibid; Schutter, "Seed policies and the Right to Food,".

[1779] GRAIN, "What's New?, (2004b). Available at: www.grain.org,

> trade agreements imposing countries to join the 1991 UPOV convention or to adopt UPOV-compliant legislation, therefore, are problematic". [1780]

However, the flexibilities enshrined under the TRIPS Agreement have been narrowed down as a result of TRIPS plus agreements. As a case in point, the discussion below explores Transpacific Partnership Agreement (TPP)[1781] so as to demonstrate how the above-discussed flexibilities have been tightened. Among a number of areas the agreement has covered, the TPP has introduced far restrictive provisions on IP which are more extensive than the global minimum standard as provided under TRIPs agreement. Among other areas covered,[1782] the Intellectual Property chapter of the agreement sets out an extensive IPRs protection framework on all Member States. In this regard, the agreement requires members, except for those already protectable under the 1991 version of UPOV, to provide Patent protection for plants. In this regard, the agreement obliges Member States to accede to UPOV 1991 by the date of entry into force of the agreement.[1783]

Moreover, under the Patentable Subject Matter section, the agreement requires State Parties to provide Patent protection for inventions derived from plants.[1784] This can include "plant genes, methods of genetically engineering plants, and even methods of conventional breeding". In this regard, it can clearly be seen that the TPP builds upon and further strengthens the minimum global standard set by TRIPS with regard to the protection of plant varieties (Article 27(3)(b)).[1785] As can be recalled from the previous discussions, the TRIPS Agreement has provided flexibility as regards the modality of protection to be provided by State Parties to plant varieties. The agreement has given discretion for the provision of protection to plant varieties, either by Patent, an effective *sui generis* system or a combination of thereof.[1786] However, by obliging State Parties to accede to the UPOV 1991 Act, the TPP has watered down the flexibility as provided under Article 27(3)(b). Moreover, the agreement eliminates the flexibility provided as regards the protection of plant varieties - under Art 27(3)(b) of the TRIPs Agreement - in that it obliges State Parties to extend Patent protection for inventions derived from plants. In this regard, Article 18(37)(4) of the agreement reads as follows,

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[1780] Schutter, "Seed policies and the Right to Food," 23.

[1781] The Trans Pacific Partnership Agreement (TPP) was signed on February 4, 2016 between U.S. and 11 Pacific Rim countries (inter alia Australia, Brunei, Canada, Chile, Japan- only country to have started the ratification process-, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam. The agreement was negotiated among these countries with the hope of advancing economic ties and slashing trade barriers in the Asia-Pacific region so as to promote free trade among the signatories. From the US. side, among other things, the agreement was meant to be a geopolitical FTA aimed at curtailing the interest of China in the region. This said however, the U.S has officially withdrawn from the treaty in January, 2017. The remaining member states however have vowed to revive it as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) after having revised its controversial provisions, see Alanna Petroff, "The Pacific trade deal Trump quit is back on," (January 23, 2018). Available at: http://money.cnn.com/2018/01/23/news/economy/trade-deal-tpp-agreement/index.html,

[1782] For more, see the full text of the, Transpacific Partnership (TPP) Agreement, concluded on 05 December, 2015 Signed on 04 February 2016.

[1783] Ibid, Article 18.7.2(d).

[1784] Ibid, Article 18(37)(4).

[1785] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27(3)(b).

[1786] Ibid.

> "A Party may also exclude from patentability plants other than microorganisms. However, each Party confirms that patents are available at least for inventions that are derived from plants".[1787]

The inclusion of such stringent provisions under the TPP - concerning IPRs protection in general - and the protection of plants more specifically, has completely eliminated the flexibility provided in the TRIPS Agreement regarding Member State's freedom in developing a national sui generis system that suits their specific interests and is in accordance with their treaty obligations in other international agreements (such as the Convention on Biological Diversity).[1788] Hence, the TPP Agreement by making the adoption of UPOV's 1991 Act an obligation for the Signatory States, subjects them for the introduction of IPRs which provides extensive protection to plant breeders. As a consequence, it can be attested that the requirement to ratify or accede to UPOV 1991 may expose those Signatory States that have yet to sign the UPOV Convention[1789] and those countries that are already members to the 1978 UPOV[1790] to the following concerns.[1791]

The loss to biological diversity - as already indicated above – may continue to put pressure on the State Parties that are forced to adopt the UPOV agreement.[1792] This is mainly due to the eligibility requirements which grant PVP to uniform and stable varieties (genetically standardized varieties).[1793] As more plan varieties are produced which conform to these criteria, the expected repercussion on the loss of genetic diversity may be insurmountable. This is because, as already highlighted in the afore discussions, the prioritization of uniform varieties in place of genetically diverse varieties militates against the adaptive capacity of varieties to changes in climate, soil, and population growth.[1794] In line with this, for those TPP Member States that are yet to ratify or accede to the UPOV 1991 Act[1795], the effect on the innovative capacities of farmers may be felt as the system only acknowledges the industrial perspective of innovation. This can be seen, for example, in the extensive exclusive rights granted to plant breeders such that they can now control all uses of the seed (seed saving) and a farmer that wants the variety for further use (such as conditioning for the purpose of propagation and offering for sale), has to seek the authorization of the original breeder and the member country.[1796]

Another issue which could have an impact in this regard has to do with the lack of due recognition given to farmers varieties (landraces). This is mainly a result of the eligibility

[1787] The Transpacific Partnership (TPP) Agreement, Article 18.37.4.
[1788] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 27 (3) (b).
[1789] As cases in point, Malaysia and Bernie have initiated the procedure for acceding to the UPOV Convention.
[1790] New Zealand, Chile and Mexico are signatories to the 1978 UPOV Act. For more see, The Transpacific Partnership (TPP) Agreement, Annex 18-A.
[1791] GRAIN, "Ten Reasons not to Join UPOV," GRAIN, (May 1998), Available at: http://www.grain.org/article/entries/1-ten-reasons-not-to-join-upov,
[1792] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991): Article 14. 1(a)(ii & iii).
[1793] Ibid, Article 5.
[1794] See, Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.
[1795] See, International Convention for the Protection of New Varieties of Plants (2 December 1961), (revised 19 Mar. 1991).
[1796] Ibid, Article 14. 1(a)(ii & iii).

requirements - stability, uniformity - for PVP protection.[1797] Farmers' traditional varieties common in many developing countries - on which the formal seed sector has based its research on, as such, fail to qualify their varieties for PVP protection due to this reason. Moreover, farmers have provided for more diverse and stable plant varieties by crossing and selecting varieties.[1798]

As the above discussion has tried to illustrate, the flexibilities enshrined under the TRIPS Agreement are now subject to various limitations as evidenced by the TPP Agreement. The cumulative result of all the aforesaid restrictions on the flexibilities further tightens the full enjoyment of the right to food as enshrined under Article 11 of the ICESCR.

[1797] Ibid, Article 5(1).
[1798] See, Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food," 304-350.

Chapter Five

Realizing the Right to Food under Climate Change

5.1. Introduction

Climate change has remained a hot topic of discussion for a long time.[1799] In this regard, the causes as well as effects of increasing rates of temperature, and global warming, as derivatives of changes in climate, have captured global attention.[1800] As such, backed by scientific revelations[1801] that GHG concentration in the atmosphere is increasing unabated[1802] mainly driven by human activity[1803] - anthropogenic causes such as industrialization - different efforts[1804] have been put forward at the global level with the aim of stabilizing the climate system. Starting from the United Nations Framework Convention on Climate Change (UNFCCC)[1805] as adopted in 1990 - which has served as a foundation for the multilateral effort - various legal instruments have been put in place, most notably the Kyoto Protocol[1806] and the recent Paris Agreement[1807] on Climate change. Notwithstanding these international efforts, however, scientific predictions have estimated that the Earth will continue to experience warming climatic conditions. This signifies that the adverse effects of climate change are going to continue to threaten ecosystems, geographic locations and populations all over the world, even though the effects will be most apparent on regions which are mainly considered vulnerable.[1808]

As will be analyzed below, climate change affects the agricultural sector, among other areas[1809], which is highly reliant on stable climatic conditions.[1810] On the other hand, industrial agricultural production also contributes a large share of GHGs emissions adversely

[1799] See, John H. Knox, "The International Legal Framework for Addressing Climate Change," 12 Penn St. Envtl. L. Rev. 135 (2004): 335-338.
[1800] See, IPCC, Climate Change: The IPCC Scientific Assessment at xvi, table 1 (J.T. Houghton et al. eds., 1990; Daniel Bodansky, "The United Nations Framework Convention on Climate Change: A Commentary," 18 Yale J. Int'l L. (1993). Available at: http://digitalcommons.law.yale.edu/yjil/vol18/iss2/2.
[1801] IPCC, Climate Change: The IPCC Scientific Assessment xvi, table 1 (J.T. Houghton et al. eds., 1990); Duncan Brack, et al, International Trade and Climate Change Policies, (The Royal Institute of International Affairs, Energy and Environmental Program, Earthscan, London, 2000):28-30.
[1802] Intergovernmental Panel on Climate Change, Climate Change, The Scientific Assessment, (Cambridge University Press,1990).
[1803] IPCC, Climate Change: The IPCC Scientific Assessment xvi, table 1 (J.T. Houghton et al. eds., 1990), IPCC, Climate Change: The Scientific Assessment, (Cambridge University Press,1990).
[1804] Proceedings of the World Climate Conference, Geneva, 1979, WMO Doc. No. 537 (1980); Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of Other Greenhouse Gases in Climate Variations and Associated Impacts, Villach, Austria, (October 9-15, 1985). The commencement of international conferences on climate change served a vital role in flag shipping the concern.
[1805] See, United Nations Framework Convention on Climate Change (FCCC), (May 9 1992).
[1806] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997).
[1807] Paris Agreement (December 13, 2015), in UNFCCC, COP Report No. 21, Addenum, at 21, U.N. Doc. FCCC/CP/2015/10/Add, 1, Jan. 29, (2016).
[1808] See, FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security, 22ff; IPCC, Methodological and Technological Issues in Technology Transfer, Special Report of Working Group III of the Intergovernmental Panel on Climate Change, (Cambridge University Press, Cambridge, UK: 2000).
[1809] For example, most vulnerable will be livestock and fisheries.
[1810] FAO, Climate Change and Food Security: A Framework Document, (FAO, Rome, 2008): 25ff.

affecting the climate.[1811] In cognizant of these issues, this chapter, focuses on the agricultural sector as among the areas most likely to be threatened by the adverse effects of climate change, *inter alia*, as a result of higher temperature as well as the occurrence of most intense and severe weather events. Taking note of this, the chapter will mainly examine how the realization of the right to adequate food[1812] is compromised by climate change-induced factors that will restrain both the availability as well as the accessibility of the right to food as incorporated under Article 11 of the ICESCR. The chapter contends that the adverse effects of climate change will continue to wreak havoc especially on the regions that are already the most food insecure as a result threatening the realization of the right to food.

Moreover, making reference to the above noted legal instruments on climate change, the chapter attests that the provisions ingrained, have not been met by the State Parties effectively such that they have not resulted in much progress in addressing the threat posed by climate change. In this respect, the chapter draws on the UNFCCC and the Kyoto Protocol to examine the extent to which they have been complied with by the State Parties so as to ensure the stabilization of the climate in the first instance, and to meet the mandatory GHG reduction commitments is the later. Under this milieu, the chapter will demonstrate that the State Parties to the UNFCCC, referring to Annex II parties[1813] that have historically contributed a large percentage of GHGs, have not met their obligations in two regards. Firstly, the chapter will attest that they not been able to bring about a stabilization of GHGs so as to prevent dangerous anthropogenic interference with the climate system, as required under the UNFCCC due to the continuation in the emission of GHGs. Furthermore, the State Parties have also not been able to meet their mandatory emission reduction commitments as part of their obligations assumed under the Kyoto Protocol.[1814]

Secondly, the chapter will especially unearth how the ineffective implementation of the obligations undertaken by developed State Parties, in consideration of their historical contribution and capability, for the transfer of environmentally sound technologies (EST) to those most vulnerable developing countries, has led to a restriction on the right of everyone to enjoy the benefit of scientific progress.[1815] This is due to the fact that, as will be explored in subsequent sections, the financial flows directed for this purpose have not been sufficient. Moreover, drawing on chapter four of the research, the chapter contends that IPRs protection granted for companies that specialize on EST found in Annex I countries, has further restrained the accessibility of scientific progress to developing countries. Hence, in cognizant of these shortfalls, the chapter will attest that by failing to effectively implement the obligations they have assumed under the UNFCCC as well as the Kyoto Protocol, the State

[1811] Olivier De Schutter, "Climate Change and the Human Right to Adequate Food: Contribution of the Special Rapporteur on the right to food," (Friedrich-Ebert-Stiftung, Geneva, 2010).
[1812] UN General Assembly, International Covenant on Economic, Social and Cultural Rights, (16 December 1966).
[1813] See, See, United Nations Framework Convention on Climate Change (FCCC), (May 9 1992).
[1814] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997).
[1815] See, UN General Assembly, International Covenant on Economic, Social and Cultural Rights, (1966): Article: 15(1)(b); Report of the Special Rapporteur in the field of cultural rights on the Right to Enjoy the Benefits of Scientific Progress and its Applications, presented at the Twentieth Session of the Human Rights Council (2012) (A/ HRC/20/26).

Parties have not been successful in bringing about stabilization in the climate system and reducing GHG emissions, as a result, contributing negatively to the realization of right to adequate food. Furthermore, as an upshot of the shortfalls in climate finance by Annex II countries as directed to assist developing countries to be able to meet their obligations, and improve local capacity, the State Parties have hindered the effective transfer of EST to those developing countries most vulnerable.

Hence, with the above issues in mind, the chapter will be organized in the following way. The first section will uncover the scientific basis that gave recognition to the underlying causes of climate change hence providing the prelude to the international effort to address climate change. The second section will explore the international legal framework on climate, by looking into the UNFCCC, and its Kyoto Protocol. This will be followed by the third section that looks into the two-sided face of agriculture both as a cause of emission as well as a direct victim of increases in GHGs. The fourth section will examine the effects of climate change on the availability as well as the accessibility of the right to adequate food. By contextualizing the discussed issues, the following section will examine biofuel production in relation to the constraints it puts on the right to food. Afterward, response mechanisms, mitigation, and adaptation, aimed at addressing climate change will be scrutinized. The final section will unravel how the right to benefit from science is restrained by the ineffective implementation of the transfer of EST obligations.

5.2. The Glaring Reality of a Changing Climate

The discussion below provides a succinct general background into the the prelude to the international effort to address climate change hence setting the tone for the subsequent analysis.

The onset of industrialization has caused a large increase in the emission of GHGs.[1816] This increase in the level of emission has been a result of anthropogenic drivers of emission which are caused by human activity, notably from population growth and industrialization.[1817] As a consequence of the expansion in the levels of emission, the concentration of several GHGs in the atmosphere has been increasing, as a result, inducing anthropogenic Greenhouse effect, as will be further explored below.[1818]

Nonetheless, before this revelation about the causes of GHG concentration in the atmosphere, as well as global warming, became apparent, numerous scientific endeavors had been conducted. Hence this confirms that concerns related to climate change are not recent revelations. In this regard, since the early 19th century, scientists had warned about the rising of the temperature of the Earth and the concentration of carbon dioxide (CO2) in the atmosphere. As a case in point, for instance, in 1827, the French scientist Fourier was the first to make the connection between atmospheric concentrations of CO2 and increasing temperature.[1819] This study underscored that greenhouse effect is caused by the Sun's high-energy solar radiation which is reflected off the Earth's surface.[1820] This radiation which is reflected from the Earth's surface, however, gets trapped by CO2, water vapor, and other GHGS[1821] in the atmosphere, as a result, causing the greenhouse effect.[1822] Building on this momentous prediction, in 1908, the Swedish scientist, Arrhenius was able to provide mathematical calculations which predicted that the doubling in atmospheric concentration of CO2 would raise global temperature by 4 degree Celsius.[1823]

These scientific developments were supported also by the commencement of intergovernmental scientific conferences around the world[1824] that aimed to flagship the

[1816] Ludivine Tamiotti, Anne Olhof, et al., "Trade and Climate Change: A report by the United Nations Environment Programme and the World Trade Organization," (WTO secretatiat, Geneva, 2009): 25ff.
[1817] IPCC, Climate Change: The IPCC Scientific Assessment xvi, table 1 (J.T. Houghton et al. eds., 1990).
[1818] Ibid.
[1819] See, Brack, et al., International Trade and Climate Change Policies, 28-30.
[1820] See, Michael Grubb, et al., The Kyoto Protocol: A Guide and Assessment, (1999); Sebastian Oberthur & Hermann E. Ott, The Kyoto Protocol: International Climate Policy for The 21st Century, (1999).
[1821] See, R.T. Watson et al., Greenhouse Gasses and Aerosols in IPCC, Climate Change: The IPCC Scientific Assessment, (J.T. Houghton A et al. eds., 1990). These GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N20), and ozone (03). Without these GHGs. the Earth would be 330 C (60'F) colder and therefore uninhabitable for humans. See, Stephen H. Schneider, Global Warming: Are We Entering the Greenhouse Century? (1989) In Prospects for Future Climate (Michael C. MacCracken et al. eds., 1990).
[1822] See, Grubb et al., The Kyoto Protocol: A Guide and Assessment; Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for The 21st Century.
[1823] See, Svante Arrhenius, On the Influence of Carbonic Acid in the Air Upon the Temperature of the Ground, Philosophical Magazine 41, No. 251 (April1896): 237-277; Brack, et al., International Trade and Climate Change Policies, 28-30.
[1824] For more, see, Judith Blau, The Paris Agreement Climate Change, Solidarity, and Human Rights, (Switzerland, Palgrave Macmillan, 2017): 23-24. The conferences that were held in the 1980's included; the

concern of climate change. For instance, a scientific conference was held in Villach, Austria in 1985, where it was concluded that "although quantitative uncertainty in model results persists, it is highly probable that increasing concentration of the GHG will produce significant climatic change".[1825]

Consequently, the 1970s and 1980's witnessed rising concerns over the warming climate as a result of growing levels of GHG emissions.[1826] The studies conducted have unveiled that the natural greenhouse effect of GHG, *inter alia*, CO2, water vapor, has the potential to alter the global mean temperature to about 15 degrees Celsius.[1827] Even though such an increase in global temperature helps to keep the Earth warm enough to sustain life, human activities, most notably the burning of fossil fuels leading to the release of more CO2 into the atmosphere, has altered this basic mechanism leading to an additional human-induced GHG effect commonly known as "global warming".[1828] The main contributor to the high levels of emission has been a result of the expansion of human activities resulting from industrialization as well as population growth. Ultimately, the studies expected higher emission levels to increase atmospheric concentrations of several GHGs.[1829] These increased emissions have disturbed the natural equilibrium between the emissions of GHGs from natural sources and the removal of these gases by "sinks".[1830] It was this equilibrium which had kept atmospheric concentrations at relatively constant levels in pre-industrial times. As such, most climate scientists have believed that increased atmospheric concentrations of GHG will eventually produce anthropogenic greenhouse effect.[1831]

While these predictions were being made, the year 1979 marked a watershed moment for the start of the international effort that gave recognition to the problem posed and to

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Villah Conference in October 1985, the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (which, as already noted, was amended in Kigali in October 2016), the Toronto Conference in June 1988, the Ottawa Conference and the Tata Conference in February 1989, the Hague Conference and Declaration in March 1989, the Noordwijk Ministerial Conference in November 1989, the Cairo Compact in December 1989, and the Bergen Conference in 1990.

[1825] See, Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of Other Greenhouse Gases in Climate Variations and Associated Impacts, Villach, Austria, (October 9-15, 1985).

[1826] See, Knox, The International Legal Framework for Addressing Climate Change, 335-338.

[1827] See, IPCC, Climate Change: The IPCC Scientific Assessment at xvi, table 1 (J.T. Houghton et al. eds., 1990; Bodansky, "The United Nations Framework Convention on Climate Change,". Predictions of greenhouse warming are based primarily on computer models of the atmosphere.

[1828] See, IPCC, Climate Change: The IPCC Scientific Assessment at xvi, table 1 (J.T. Houghton et al. eds., 1990); Intergovernmental Panel on Climate Change: The Science of Climate Change 1995: The Science of Climate Change, (Cambridge University Press, 1996); Maria S. Emanuelli, Jennie Jonsén & Sofía M. Suárez, eds., Red Sugars, Green Deserts, (FIAN International, FIAN Sweden, HIC-AL, and SAL 2009):79. Human "activity induced emission of GHG gases have the characteristic of allowing the penetration of radiation from the sun, which comes primarily in short waves, being emitted at a surface temperature of 6000ºC. But the gases block the exit of radiation emitted by the Earth, which is primarily long wave, being emitted at an average temperature of 14.5 ºC. This phenomenon, known as the greenhouse effect, results in an increase of atmospheric temperature, given that in absence of these gases, the temperature would be -20 ºC, too cold for the majority of life forms, including human".

[1829] IPCC, Climate Change: The IPCC Scientific Assessment at xvi, table 1 (J.T. Houghton et al. eds., 1990).

[1830] Carbon sinks include plants and trees, which sequester carbon through photosynthesis, and the oceans, which take up carbon at the surface and store it at great depths. Other greenhouse gases are removed from the atmosphere largely through atmospheric reactions. For more, see, Watson et al., Greenhouse Gasses and Aerosols, in Climate Change: The IPCC Scientific Assessment at xvi, table 1 (J.T. Houghton et al. eds., 1990).

[1831] Ibid.

correspondingly propose solutions to address the challenge. This period, as such, witnessed the commencement of the first World Climate Conference which was convened by the United Nations World Meteorological Organization (UNWMO), in Geneva.[1832] The conference highlighted that world governments must prevent potential man-made effects on the climate that will have an adverse effect on humanity. This scientific conference was also significant as it has led to, alongside the United Nations Environmental Program (UNDP), the establishment of the World Climate Program as well as the scientific body on climate change, the Intergovernmental Panel on Climate Change (IPCC) in 1988.[1833]

With this rising concerns in mind, governments[1834] urged the World Meteorological Organization (WMO) and the United Nations Environmental Program (UNEP), to establish the Intergovernmental Panel on Climate Change (hereafter, IPCC)[1835] in 1988 and tasked it with the assessment and identification of the impact, timing, and magnitude of climate change.[1836] It was specifically given the mandate to "provide internationally coordinated assessments of the magnitude, timing and potential environmental and socio-economic impact of climate change and realistic response strategies".[1837] The IPCC[1838] was composed of close to 2500 scientists gathered from all over the world and it was tasked with the preparation of the first international scientific assessment of the risks of global warming.

The IPCC published its first report in 1990 at the Second Climate Conference held in Geneva[1839] in which it cautioned that if countries emission levels continued along the same path, the average temperature of the world would increase by 0.3 degrees Celsius every decade, being the fastest rate seen in the past 10,000 years.[1840] The report affirmed for the first

[1832] Proceedings of the World Climate Conference, Geneva, 1979, WMO Doc. No. 537 (1980).
[1833] Report of the Thirty-Ninth Session of the Executive Council 7, Geneva, (June 1-5, 1987), WMO Doc. 682 (1987); UNEP: Report of the Governing Council, U.N. GAOR, 42nd Sess., Supp. No. 25, U.N. Doc. A/42/25 (1987); Report of the Fortieth Session of the Executive Council 74, Geneva, (June 7-16, 1988), WMO Doc. 707 (1988).
[1834] See, William Nitze, "Improving U.S. Interagency Coordination of International Environmental Policy Development, Environment," (May 1991): 10-13. In this regard, the U.S. played an important role in this vein as it saw the climate issue as a matter of domestic policy emphasizing on the economic costs of climate change response measures and the need to undertake more research in this regard.
[1835] For more, see, Report of the Thirty-Ninth Session of the Executive Council 7, Geneva, (June 1-5, 1987); UNEP: Report of the Governing Council, U.N. GAOR, 42nd Sess., Supp. No. 25, U.N. Doc. A/42/25 (1987); Report of the Fortieth Session of the Executive Council 74, Geneva, (June 7-16, 1988), WMO Doc. 707 (1988). For general discussions of the IPCC, see Jack Fitzgerald, "The Intergovernmental Panel on Climate Change: Taking the First Steps Towards a Global Response," 14 S. ILL. U. L.J. 231 (1990).
[1836] UN General Assembly, Protection of Global Climate for Present and Future Generations of Mankind, G.A. Res. 53, U.N. GAOR, 43rd Sess., Supp. No. 49, at 133, 134, U.N. Doc. A/43/49 (1988).
[1837] Ibid.
[1838] The IPCC is supported by three Working Groups and a Task Force on National Greenhouse Gas Inventories, including the Working Group on Climate Change Impacts, Adaptation and Vulnerability, which could provide invaluable input on the impacts of climate change on food security of vulnerable populations.
[1839] Jaeger, Jill and H. L. Ferguson, "Climate Change: Science, Impacts and Policy: Proceedings of the Second World Climate Conference". (Cambridge: Cambridge University Press. (Cambridge University Press, WMO ; 1991); IPCC, Climate Change. The IPCC Scientific Assessment (J. T. Houghton, G. et al. eds.). (Cambridge: Cambridge University Press, 1990).
[1840] See, Knox, "The International Legal Framework for Addressing Climate Change," 335-338; Intergovernmental Panel on Climate Change, Climate Change: The Scientific Assessment, (Cambridge University Press, 1990); Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for the 21s Century.

time that rising concentrations of carbon dioxide, as well as other GHGs in the atmosphere, were a result of emissions arising from human activity[1841], anthropogenic causes.[1842] As a result, this report by the IPCC served a vital role in setting the tone by providing the scientific base for the negotiations on the Climate Change Convention of 1992. The second Assessment report[1843] of the IPCC came out in December 1995 and strongly confirmed that GHG concentration has continued to rise as a result of human activity. Accordingly, after an examination of different technologies with the aim of reducing emissions and enhancing sinks of GHGs, the Second Assessment Report brought to attention the potential for "noregret"[1844] measures to limit as well as reduce GHG emissions. As such, the report concluded that reductions of GHG is not only possible but also economically feasible and that in the absence of any mitigation effort, global temperature is expected to rise by 2degree centigrade by 2100.[1845]

With due consideration to these reports and the growing awareness in the irregularities of weather patterns, the United Nations General Assembly (hereinafter, UNGA)[1846] adopted a resolution that called on States to start negotiation on a framework convention[1847] on climate change. In response to this call, the UNGA established the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC) in 1990 which was mandated to negotiate a convention containing "...an effective framework convention on climate change, containing appropriate commitments"[1848] to be ready for signature at the United Nations Conference on Environment and Development (UNCED) which was to be

[1841] The first Assesment Report by the IPCC fails short from directly recognizing GHG concentration to human activity while doing so only by attribution which is "... the act of regarding a quality or feature as a characteristic or inherent part of someone or something. The act of attributing, especially the act of establishing a particular person as the creator of a work of art"., Attribution Law and Legal Defininition, U.S. Legal.com, Accessed from, https://definitions.uslegal.com/a/attribution/, Accessed on 05/01/2020.

[1842] Intergovernmental Panel on Climate Change, Climate Change: The Scientific Assessment, (Cambridge University Press, 1990).

[1843] Intergovernmental Panel on Climate Change, Climate Change 1995: The Science of Climate Change, (Cambridge University Press, 1996). The report showed for example that the concentration of GHS such as CO2 has increased by 30 percent since pre-industrial times while the concentration of Methane has doubled.

[1844] Ibid; Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for The 21st Century; Grubb et al., The Kyoto Protocol: A Guide and Assessment. "Noregret measures" are those measures whose benefits equal or exceed their costs to society. This means that the First Assessment Report concluded that some countries have significant opportunities to limit GHG at no net cost. They can result from the lowering of market barriers and economic distortions and a reduction is adverse impacts of CO2 emission such as polluting emissions as well as traffic congestion.

[1845] Intergovernmental Panel on Climate Change, Climate Change 1995: The Science of Climate Change; Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for The 21st Century; Grubb et al., The Kyoto Protocol: A Guide and Assessment. The report further asserted that even if stabilization of greenhouse gas concentrations were achieved, temperature would continue to increase beyond this point because of the thermal inertia of the oceans; assuming stabilization in 2100, only 50-90 per cent of the eventual temperature change would have occurred by then.

[1846] UN General Assembly, Protection of Global Climate for Present and Future Generations of Mankind, (1990).

[1847] Framework conventions generally set up institutional means of addressing complex issues; more-specific obligations can be added later through protocols to the initial convention. For example, in 1985 the international community had adopted a framework convention on ozone depletion, and followed it two years later with the Montreal Protocol setting binding phase-out periods for ozone-depleting substances. This approach to ozone depletion was seen as a model for climate change.

[1848] UN Protection of Global Climate for Present and Future Generation Mankind, (1990).

held in Rio de Janeiro in June 1992.[1849] The negotiations took place in 1991 and 1992 culminating in the United Nations Framework Convention on Climate Change (UNFCCC)[1850], which was signed in May 1992 with 154 State Parties and then European Community (EC)[1851], as part of a package of instruments that were adopted for the United Nations Conference on Environment and Development held in Rio De Janeiro in 1992.[1852] Therefore, the global concern about increasing rates of temperature and the underlying factors for this peak, have been momentous in fueling the international effort to address the problem of climate change as will be the subject of examination in subsequent sections.

[1849] Ibid.
[1850] See, United Nations Framework Convention on Climate Change (FCCC), (May 9 1992).
[1851] See, Grubb et al., The Kyoto Protocol: A Guide and Assessment. The UNFCCC came into force in 1994 with 179 signatories. It is thus universally accepted as the basis of international politics on climate change. The price for this universal acceptance was high, however, because "hard", legally binding reduction targets had to be abandoned in favor of a "soft" approach.
[1852] UN General Assembly, Protection of Global Climate for Present and Future Generations of Mankind, (1990).

5.3. Multilateralism to Tackle Climate Change

The UNFCCC[1853] (hereinafter, Framework Agreement), as noted above, was adopted on May 9, 1992, at the conclusion of the United Nations Conference on Environment and Development - Earth Summit- which was held in Rio de Janeiro.[1854] Especially, the increasing awareness about emissions emanating from the burning of fossil fuels mainly that of CO2, which if left unaddressed would cause a rapid rise in the Earth's temperature[1855], has provided the impetus for the conclusion of the agreement. The discussion below will explore this agreement by dissecting into its core principles and ensuing state obligations.

5.3.1. UNFCCC: Ensuing Obligations

In line with the above noted Assessment Reports provided by the IPCC which confirmed that human activities - anthropogenic causes - have a significant contribution to global warming[1856], the UNFCCC defines climate change as, "...a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".[1857] With this elucidation, the agreement gives due recognition to the human-induced causes of global warming although it falls short in terms of putting in place hard obligations on its State Parties to reduce their GHG[1858] levels.[1859] Rather, similar to other framework agreements, it merely sets goals and puts in place a cooperative framework for the achievement of those goals.[1860]

The Framework Agreement recognizes as its ultimate goal, as well as any future legal agreements that its parties may adopt, the "...stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".[1861] It moreover sets out a limit as to when such stabilization is expected to occur. It provides that, "...such a level should be achieved, **within a time frame sufficient to allow ecosystems to adapt naturally to climate change to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner**" (emphasis added).[1862] Hence, the Framework Agreement, by giving due recognition to the need to stabilize "dangerous greenhouse gases", puts climate change as a problem and

[1853] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992).
[1854] Ibid.
[1855] IPCC, Climate Change: The IPCC Scientific Assessment xvi, table 1 (J.T. Houghton et al. eds., 1990).
[1856] Ibid.
[1857] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 1(2).
[1858] Greenhouse gases are defined in the UNFCCC as "...those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation". See also, Article 1(5).
[1859] Andresen, "US Greenhouse Policy: Reactionary or Realistic?,"; U.S. General Accounting Office (GAO), "Global Warming: Administration Approach Pending,". Cautious Validation of Threat. this was so due to strong opposition by the U.S. which argued that States should instead focus on developing national programs and strategies consisting of concrete policy measures.
[1860] See, Knox, "The International Legal Framework for Addressing Climate Change,"; UNFCCC: Article 1(8) & Article 4.(1), 5&12. The UNFCCC requires each party, *inter alia*, to: (a) sinks, to report on its "national inventories" of sources and of greenhouse gases; (b) implement national programs to mitigate climate change; (c) report on its implementation of the FCCC; and (d) cooperate with other countries in studying climate change.
[1861] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 2.
[1862] Ibid.

legitimizes it as a matter of international concern.[1863] This said, on which principles is the Framework Agreement built upon?

5.3.2. Main Building Blocks

The principles incorporated in the Framework Agreement have been put in place, with a view to guiding the State Parties in their actions to achieve the objectives of the agreement and implement the provisions therein.[1864] These principles upon which the UNFCCC is based on are provided under Article 3 of the agreement. The provision stipulates, that the protection of the climate system should be "...for the benefit of present and future generations of humankind, on the basis of **equity and in accordance with their common but differentiated responsibilities and respective capabilities**" (emphasis added).[1865]

Accordingly, the first principle upon which the UNFCCC is built on is the notion of "equity". This principle has been dubbed as difficult to interpret precisely.[1866] Notwithstanding this concern for a precise definition, however, its meaning can be linked to sustainability.[1867] Hence, the principle of equity is concerned with the fair distribution of social and environmental benefits, as well as burdens.[1868]

The second principle, "common but differentiated responsibility"[1869], gives due recognition to the difference in terms of contribution of States to climate change as well as the vulnerability to its impacts. In cognizant of this fact, the same provision puts the burden for combating climate change on developed countries by stressing that developed country State Parties, "...should take the lead in combating climate change and the adverse effects[1870] thereof".[1871] This said the inclusion of this provision during the negotiation process was, however, a subject of varying interpretation between developing and developed country parties. For developing countries, this was so because developed countries bear the "main responsibility" for the climate change problem".[1872] From the vantage of point of developed counties, mainly the U.S., however, as opposed to bearing major responsibility, developed countries should take the lead due to their greater financial and technical capabilities.[1873]

[1863] Bodansky, "The United Nations Framework Convention on Climate Change,".
[1864] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 3.
[1865] Ibid, Article 3(1).
[1866] For an analysis of different (conflicting) interpretations of the equity principle under the UNFCCC, see ICHRP Rough Guide 2008, chapter 5.
[1867] See, IPCC, Development, Sustainability and Equity: Proceedings of the Second IPCC Expert Meeting on Des, Havana, Cuba (February 23–25, 2000).
[1868] Ibid.
[1869] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 3.
[1870] Ibid, Article 1; UNOHCHR Climate Change Report, (2009). The UNFCCC defines "adverse effects of climate change" as "changes in the physical environment or biota resulting from climate change which have significant deleterious effects … on human health and welfare" such as the injurious effects of climate change on human rights.
[1871] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 3(1).
[1872] Bodansky, "The United Nations Framework Convention on Climate Change,".
[1873] Ibid.

The same provision moreover stipulates that the special circumstances of developing country parties and especially those countries that are particularly vulnerable to the adverse effects of climate change should be given full consideration.[1874] In this regard, the agreement stresses that special consideration should be given to developing country parties that would have to bear " ...a disproportionate or abnormal burden under the Convention...".[1875] Hence, with due consideration to such common but different responsibilities among the State Parties, the Framework Agreement stresses that developed countries should provide financial resources to assist particularly vulnerable developing countries with the costs of mitigation and adaptation measures in order to address climate change, including the transfer of technology.[1876] As such, the principle of common but differentiated responsibility vows to ensure the fair distribution of climate change burden among the State Parties.

The third principle, as enshrined in the UNFCCC, is the "precautionary principle".[1877] In this regard, the Framework Agreement stresses that the State Parties should take "...precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects".[1878] This principle stresses that when faced with threats of a serious nature or irreversible damage, "...lack of full scientific certainty should not be used as a reason for postponing such measures...".[1879] Moreover, the principle stresses that the precautionary measures to be adopted should be cost-effective in order to ensure benefits at the lowest cost.[1880] In line with this, such policies and measures moreover should take into account "...different socio-economic contexts, be comprehensive, cover all relevant sources, sinks, and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors".[1881]

The fourth principle, which is meant to guide the State Parties, deals with the principle of "sustainable development".[1882] The provision provides that the State Parties have the right to

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[1874] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 3(2).
[1875] Ibid.
[1876] Ibid, Article 4(3).
[1877] Ibid, Article 3(3). For more on the Precautionary Principle, see, See, Daniel Bodansky, "Scientific Uncertainty and the Precautionary Principle, Environment," (September 1991): 4; James Cameron & Juli Abouchar, "The Precautionary Principle: A Fundamental Principle of Law and Policy for the Protection of the Global Environment," Int'l & Comp. L. Rev. 1 (1991); Lothar Giindling, The Status in International Law of the Principle of Precautionary Action, in the North Sea: Perspectives on Regional Environmental Cooperation, (David Freestone & Ton Ijlstra eds., 1990); Ellen Hey, "The Precautionary Concept in Environmental Policy and Law: Institutionalizing Caution," Geo. Int'l envt's. L. Rev. 303 (1992).
[1878] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 3(3).
[1879] Ibid.
[1880] Ibid, article 3(4) and 3(5). Article 3(4) provides that "The Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change." Article 3(5) states that "The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade".
[1881] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 3(3).
[1882] During the negotiation process, developing countries pressed for inclusion of a principle recognizing that "the right to development is an inalienable human right" and that "all peoples have an equal right in matters relating to reasonable living standards". Meanwhile, some developed countries wished to include a principle that

promote sustainable development.[1883] In this regard, the principle connotes firstly that the policies to be adopted to protect the climate should be appropriate for the specific conditions of each Party. Secondly, such measures to be adopted should be part of national development programs (NDP) of the State Parties concerned while taking into account that economic development is vital for adopting measures to address climate change.[1884]

5.3.3. Obligations: Annex I and Annex II

While the above has assessed the UNFCCC in relation to its main building blocks, the following section will examine the ensuing obligations and the different categorization of the State Parties based on the above-discussed building blocks.

The Framework Agreement puts obligations on two types of State Parties. The first category, Annex I, refers to developed countries that were members of the OECD as of 1992, as well as countries undergoing "transition into market economy[1885], such as Russia and Eastern European members of the former Soviet bloc (with the exception of Yugoslavia). These two groups are together referred to in the UNFCCC as Annex I countries.[1886] Hence, the State Parties under Annex I mainly comprise of highly developed industrialized countries that have contributed significantly to GHG emissions and have undertaken emission reduction commitments. The second category refers to Annex II countries[1887], which is comprised of OECD countries as of 1992 and then members of the European Community (EC).[1888] The third category, Non-Annex I parties in the Framework Agreement refer mostly to developing countries that are most vulnerable to climate change. Least developed States have been put under this category which are to receive special consideration for funding, technology transfer,[1889] and are granted the possibility to file their initial report "at their discretion" instead of within a specified time frame.[1890] As such, different provisions of the Framework Agreement apply to different categories of States; those which apply to all parties, those that apply to industrialized countries, OECD countries, and countries undergoing the process of transition into a market economy, and those which apply on Non-annex I countries.[1891]

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states have a duty to aim at sustainable development. Bodansky, "The United Nations Framework Convention on Climate Change,".

[1883] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 3(4).

[1884] Ibid.

[1885] The phrase "countries undergoing the process of transition into a market economy" is known by the acronym CEITs. These countries are in the agreement referring to Croatia, Czeck Republic, Monaco, Slovakia, Slovenia, See also, Annex I.

[1886] Annex I Parties of the FCCC include Australia, Austria, Belgium, Bulgaria, Canada, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, The Netherlands, New Zealand, Norway, Poland, Portugal, Romania, the Russian Federation, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine, the United Kingdom and the United States.

[1887] Annex II State Parties comprise of OECD members not including countries in transition.

[1888] This category primarily serves as the reference list for financial obligations under the FCCC.

[1889] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(9).

[1890] Ibid, Article 12(5).

[1891] Oberthiir & Hermann, "The Kyoto Protocol International Climate Policy for the 21st Century," 33ff.

In this regard, industrialized parties in Annex I are under the soft obligation to adopt national strategies and to take corresponding measures on the mitigation of climate change, "... by limiting anthropogenic emissions of greenhouse gases and protecting and enhancing...greenhouse gas sinks and reservoirs".[1892] Moreover, the Framework Agreement requires industrialized Annex I States to provide "...detailed information on the policies and measures, as well as on its resulting projected anthropogenic emissions with the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases...".[1893]

Furthermore, Annex I State Parties are put under more stringent obligations in the Framework Agreement. In this light, aside from the general commitment to adopt national policies and measures to limit GHG emissions and to protect and enhance sinks and reservoirs[1894], they are subject to more strict reporting requirements. Hence, Annex I Parties are required to communicate initial reports within six months of the agreement's entry into force, whereas other parties have been given three years to complete their reports.[1895] Moreover, the report to be communicated must give detailed information on policies and measures, as well as on the projected effects on emissions by sources and on removals by sinks.[1896] It should furthermore take into account the "best available scientific knowledge".[1897] Finally, Annex I parties are required to coordinate economic and administrative instruments by periodically reviewing their policies and practices that contribute to increased GHG.[1898]

Cognizant of the reduction in the level of CO2 emissions as well as economic decline, the Framework Agreement gives some flexibility for those countries that are undergoing the process of transition into a market economy (CEITs) especially in terms of choosing the base year different from 1990. As a result, they have been given the option to pick a year with their highest levels of emission as a reference for their obligations under the Framework Agreement.[1899] Besides this exception, however, the Framework Agreement has used 1990 to be the base period of the commitment for industrialized countries and a point of reference for following negotiations.[1900]

[1892] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(1)(a).

[1893]Ibid, Article 4(2); Sands, Phillippe, "The United Nations Framework Convention on Climate Change," Review of European Community & International Law, No. 1 (1992):273. This provision has been dubbed as the most impenetrable treaty language ever drafted.

[1894] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(2)(a). "Reservoir" is used to refer to "a component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored".

[1895] Ibid, Article 4(2)(b) & Article 12(5); Bodansky, "The United Nations Framework Convention on Climate Change,".

[1896] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(2)(b) & (c) &Article 12(5).

[1897] Ibid.

[1898] Ibid, Article 4(2)(d); Bodansky, "The United Nations Framework Convention on Climate Change,".

[1899] See, Oberthiir & Hermann, The Kyoto Protocol International Climate Policy for the 21st Century, 33ff. Bulgaria, Hungary, Poland, Romania and Slovenia have invoked this provision when they submitted their first national communication, which was accepted by the second and fourth Conferences of the Parties.

[1900] Ibid.

Moreover, OECD and EC - Annex II - State Parties have special obligations when it comes to their requirement for reporting with regard to financial obligations and technology transfer. In this regard, the Framework Agreement only creates substantive obligations[1901] for this group of States as they are under the obligation to share in the full costs of reporting[1902], the "agreed full incremental costs" of other implementing measures such as emission mitigation projects, to assist the developing countries that are vulnerable to the adverse effects of climate change in meeting the costs of adaptation measures, and to take all steps to promote, facilitate and finance, the transfer of or access to, environmentally sound technologies and know how to other Parties".[1903]

[1901] Ibid.
[1902] See, United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 12.
[1903] Ibid, Article 4(3), 4(4), 4(5).

6. The Kyoto Protocol: Prelude to Mandatory Emission Reduction Commitments

As the above discussion has denoted, the UNFCCC, perhaps because of strong opposition from the U.S[1904], did not put in place provisions with a view to establishing mandatory reduction commitments of GHG emissions. Rather, it has only put in place voluntary targets to be met by industrialized countries to return their GHG to 1990 levels by the year 2000.[1905] With due recognition to the fact that voluntary targets were insufficient to meeting the stated objective of the Framework Agreement[1906] and drawing from positive experience gained from the Montreal protocol negotiations[1907], the Committee of the Parties (hereafter, COP)[1908] met up in Berlin in 1995 where it deliberated on the adoption of an instrument with strengthened commitments that go well beyond the year 2000. In line with this aim, COP1 adopted the Berlin Mandate, which set out the principles that will guide the development of a protocol. In this vein, the principles adopted aimed at setting a legally binding target and timetables for the reduction of GHG.[1909] Building on this mandate, the Kyoto Protocol was adopted on the third COP meeting that was held in Tokyo, Japan on December 11, 1997.[1910] It was adopted to be in line with the Framework Convention on Climate Change (FCCC), which authorizes the COP to adopt, at any ordinary session, protocols to the Convention.[1911] Therefore, at the third COP meeting (COP 3), the State Parties adopted the Kyoto Protocol to the FCCC.

Unlike the UNFCCC, which mainly focused on mitigation and adaptation strategies to deal with climate change, the Kyoto protocol, which entered into force in 2005[1912] at the 7th meeting of the COP in Marrakesh, Morocco, has set mandatory emission reduction commitments on the State Parties.[1913] In this regard, the Protocol has set binding limits on

[1904] Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for the 21st Century; Knox, "The International Legal Framework for Addressing Climate Change,".

[1905] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(2).

[1906] See, Brack, et al., "International Trade and Climate Change Policies,". For instance, by 1997, CO2 emissions with the United States and Japan had grown by more than 10 per cent despite their commitments under the FCCC.

[1907] Montreal Protocol commitments provide legally binding commitments regarding ozone depleting substances. Montreal Protocol on Substances that Deplete the Ozone Layer114 has emerged as a significant mechanism for the international regulation and phase-out of certain greenhouse gases with a high global warming potential (GWP). See, Sigurd L. Pedersen, Danish Domestic CO2 Cap & 2 Trade Scheme, (2006).

[1908] The Committee of the Parties (COP) serves as the supreme decision making organ of the Framework Agreement. For detailed discussion of all COP meetings, see, UNFCCC, "A Brief Overview of Decisions", which is available at, http://unfccc.int/documentation/decisions/ items/2964.php,

[1909] See, Brack, et al., "International Trade and Climate Change Policies,"; Oberthiir & Hermann, The Kyoto Protocol International Climate Policy for the 21st Century, 47. Aside from the aim to introduce substantive and mandatory reduction commitments, COP1 hoped to ensure support for developing countries in that it affirmed that no new obligations for developing countries would be introduced in the next round of talks.

[1910] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997).

[1911] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 17(1).

[1912] The Kyoto Protocol entered into force four years after it was signed because the negotiations on the specific rules and procedures for implementing the Protocol continued after the Protocol was signed.

[1913] In 2003, after the election of President George W. Bush, the U.S. officially withdrew from the Kyoto Protocol. This was because due to domestic political reasons, the United States, was never was in a position to accept a climate agreement formally based on mandatory recognition of past emissions. Instead, the country advocated for a universal global agreement that would include binding provisions for developing countries as well, particularly China and India. Following suit, Canada, Australia, Japan, and Russia eventually stepped away from the Kyoto Protocol. In this regard, Canada and Australia withdrew from the Protocol after conservative governments were elected with the critical help of the fossil fuel industry. See, Raymond Clemencon, "The Two Sides of the Paris Climate Agreement: Dismal Failure or Historic Breakthrough?," Journal of Environment &

emissions for Annex I countries during the first commitment period, 2008–2012.[1914] The agreement specifically provides that, Annex I Parties[1915] shall individually or jointly,

> "...**ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases[1916] listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B** and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels[1917] in the commitment period 2008 to 2012" (emphasis added).[1918]

6.1. Ensuing Obligations: Stringent Rules for Emission Reduction

In a major move away from the soft obligation framework provided by the UNFCCC, the adoption of the Kyoto Protocol on Climate Change has brought with it stringent emission reduction obligations on the State Parties. In the light of this, emission limitation as well as reduction commitments during the first commitment period (2008-2012) are covered under Annex B of the Protocol and are differentiated between the State Parties.[1919] Accordingly, for Annex I State Parties and most of the GHGs[1920], the base year for the stipulated limitation and reduction commitment period is set to be 1990[1921] in the Protocol.

Annex B to the Kyoto protocol covers assigned amounts of emission which is calculated pursuant to the State Parties quantified emission limitation and reduction commitments as a percentage of the base year.[1922] Therefore, as a novel contribution of the Protocol, State Parties have different binding targets and timetables for emission reduction. Accordingly, the U.S., for instance, is required to reduce its GHG by 7% from the base year (referring to 93% of commitment assigned) while Japan has a reduction commitment of 6% (94% of commitment assigned) calculated from the base year.[1923] The European Union on its part has

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Development, Vol. 25(1), (Global Studies Department and Department of Sociology, University of California, Sage Publication 2016): 3–24.

[1914] Kyoto Protocol: Annex 2.

[1915] Annex 1 Parties refer to Annex 1 parties to the FCCC which is comprised of industrialized countries and countries in transition.

[1916] Kyoto Protocol: Annex 2; Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for the 21st Century. The basket of greenhouse gases listed in Annex A, the main GHGs; carbon dioxide, methane, nitrous oxide, and fluorinated gases, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.

[1917] "The language expressing a "view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels" has been dubbed as mostly being aspirational. This is because of studies that have estimated that if all of the Annex I parties met the commitments set out in Annex B, their total emissions would decrease by about 5.2%". See, Knox, "The International Legal Framework for Addressing Climate Change,".

[1918] For detailed look into the provisions, see, Kyoto Protocol to the Framework Convention on Climate Change, (1997): Article 3(1).

[1919] See, Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for the 21st Century.

[1920] The GHGs refer to Carbon dioxide (C02) Methane (CH4) Nitrous oxide (N20) Hydrofluorocarbons (HFCs) Perfluorocarbons (PFCs) Sulphur hexafluoride (SF6), See Kyoto Protocol: Annex A.

[1921] Kyoto Protocol: Article 3(1).

[1922] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Annex 2.

[1923] Ibid; Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for the 21st Century.

to reduce GHG by 8% (amounting to 92% commitment).[1924] The commitment assigned to each State Party was set to be met during 2008-2012. This implies that during this period, each party's level of emissions averages its commitment amount.[1925] This implies for instance that the U.S. is allowed to emit 93% of its base year GHG during this period as an average from 2008-2012.[1926]

Furthermore, the Protocol makes a basket of three gases and two groups of fluorinated GHGs as being the subject of reduction commitment by the State Parties.[1927] As such, six GHGs have been identified in total. These include carbon dioxide, nitrous oxide, methane, hydrofluorocarbons (FHCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6) including changes in emission that result from land use patterns and forests.[1928]

Moreover, the Kyoto protocol has built upon the FCCC as it granted "countries in transition" (CIT), the possibility of choosing the base year between 1988-1989 based on an assessment of the period when their emissions were higher than they were in 1990.[1929] The protocol provides, however, that for the three GHGs, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride, Annex I Parties should use 1995 as the base year as the level of emission is greater than the level during 1990.[1930]

According to the Protocol, in order to meet the commitment set out in Article 3 of the Protocol, State Parties shall elaborate and implement national strategies in accordance with their national circumstances, *inter alia*, protection, and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol.[1931]As such, the Protocol gives State Parties the discretion of choice as to the mechanism for the implementation of their commitments. The provision states specifically that Annex I Parties can implement and elaborate on policies and measures in accordance with their national preferences, however, listing potential areas of action; *inter alia*, energy efficiency, sinks, and reservoirs, agriculture.[1932] In order to strengthen the effectiveness of such national strategies, the Protocol calls for cooperation with other parties.[1933] It specifically promotes cooperation in order "to enhance the individual and combined effectiveness of their policies and measures".[1934]

[1924] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997), Annex 2.
[1925] Ibid, Annex 3(7).
[1926] For more, see, Knox, The International Legal Framework for Addressing Climate Change, 137-138; Oberthiir & Hermann, The Kyoto Protocol International Climate Policy for the 21st Century.
[1927] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Annex 2.
[1928] Ibid, Annex A.
[1929] Ibid, Article 3(5).
[1930] Ibid, Article 3(8).
[1931] Ibid, Article 2(1)(a)(ii).
[1932] Ibid, Article 2(1)(a). These policies and measures in accordance with national strategies may related to, energy efficiency, sinks and reservoirs, agriculture, new and renewable energy sources and carbon sequestration, market instruments14 and market imperfections, transport, and waste management as well as other sectors.
[1933] Ibid, Article 3. In order to reduce GHGs emanating from aviation and maritime travel, the Parties are to work through the International Civil Aviation Organization and the International Maritime Organization.
[1934] Ibid, Article2(1)(b). Moreover, Article 2(3) of the Protocol requests Parties to "strive to implement policies and measures... in such a way as to minimise adverse effects, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties".

6.2. Kyoto Mechanisms: Mitigation Targets

The section below will uncover "Kyoto Mechanisms"/flexibilities as incorporated in the agreement. The Kyoto Flexibilities (Kyoto Mechanisms) have been integrated into the Protocol in order to assist State Parties (Annex 1) to meet their emission targets. In this vein, the mechanisms have the objective of optimizing the cost-effectiveness of emissions reduction initiatives by lowering the cost of compliance with the above-discussed respective emission targets assumed under the Protocol. The mechanisms so provided are focused mainly on mitigation measures to clamp down on GHG emissions. This is in line with the UNFCCC, which authorizes Annex I parties to adopt national programs to mitigate climate change. The State Parties to the Kyoto Protocol are additionally required to provide specific information on emission levels as well as measures being used to reduce them. Upon the effective provision of such information, the protocol allows the State Parties to make use of the flexible mechanisms in order to allow them to reach their emission standards. The flexibilities as ingrained under the Protocol include the international emission trading system[1935], the joint implementation (JI) mechanism[1936] and the clean energy development mechanism (CDM)[1937]. In the light of this, the discussion below will uncover these flexibilities.

The first flexibility, the CDM ensures credit for emission reduction for those developed country members that have helped to devise schemes in developing countries with a view to help combat climate change.[1938] In this regard, the CDM structure guarantees Annex I governments, and companies as authorized by them, to purchase Certified Emission Reductions (CERs) generated from undertaking emission-reduction development projects in Non-Annex I countries.[1939] As such, a project, firstly, will only be eligible under the CDM given, in the country, it is being employed, it helps to achieve sustainable development. Secondly, such a project will be eligible given it reaches GHG emission reductions which are "additional" to a GHG reduction that would not have occurred in the absence of the proposed project.[1940] This provision was, however, a central point of debate during the negotiations. The disagreement mainly revolved around the idea that developing countries are able to receive similar levels of emission reduction commitments. The U.S. and other developed

[1935] Ibid, Article 17.
[1936] Ibid, Article 6(1).
[1937] Ibid, Article 12.
[1938] Ibid. While these flexible mechanisms have a role of stimulating mitigation measures, the Kyoto Protocol also provides an original mechanism under the CDM to gather substantial funding for adaptation measures. Contrary to the voluntary contributions to the other funds under the UNFCCC, the Adaptation Fund under the Kyoto Protocol will automatically receive a share of the proceeds from investments in CDM projects to finance adaptation plans in developing countries.
[1939] Ibid.
[1940] See, Elisabeth Caesens and Maritere Padilla Rodríguez, Climate Change and the Right to Food: A Comprehensive Study, (Heinrich Böll Foundation, Eds), Vol. 8, (Colombia University, Heinrich-Böll-Stiftung, 2009): 77; Alan S. Miller, "International Trade and Development 296," in Global Climate Change and U.S. Law, (M. Gerrard, ed,) (2007). For instance, a CDM projects in the clean energy sector, particularly fuel (clean cooking fuel) and electricity (clean water) projects, are likely to satisfy the emission-reduction and sustainable development requirements for CDM designation.

countries strongly supported the idea while the EU and developing countries were opposed to the proposal.[1941]

The Second flexibility, the JI[1942] allows Annex I Parties to fulfill their commitments as enshrined under Article 3 jointly given their total combined emissions do not exceed the amounts assigned to them under Annex B. This flexibility has been ingrained in the Protocol with due recognition that measures aimed to limit emissions should be undertaken in countries where doing so will be cheap and profitable.[1943] Thus, in the light of differences in mitigation costs in different countries, such as in the efficiency of energy use, emission reductions are considered to be cheaper in developing countries when compared to OECD countries. As such, State Parties from the OECD (or their industries) have endeavored to get credit for having undertaken climate protection projects abroad.[1944]

The third Kyoto flexibility, international emission trading system (also known as Cap-and-Trade/cap)[1945], allows State Parties to establish an international emission trading system so that they can comply with their targets in a cost-effective way.[1946] This means that the strategy gives the possibility of emission trading among those Annex I parties that have effectively undertaken commitments pursuant to Article 3.[1947] The Protocol allows such two parties to trade part of their emission commitment with each other.[1948] In this regard, any Annex I party is able to transfer to or acquire from any other Annex I party "emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases".[1949] This said, however, the emission trading is to take place between the intending parties provided that the project's benefit with respect to greenhouse gases "...is additional to any that would otherwise occur and that certain other requirements are met".[1950] Nonetheless, the flexibility has drawn several criticisms such as, for having national environmental justice consequences, *inter alia*, lack of public participation and caution over the possibility of an unjust distribution of the GHG emission

[1941] Knox, "The International Legal Framework for Addressing Climate Change," 140-142.
[1942] Ibid, Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Article 3(1). Although this provision is open to any group of countries, only the EU is expected to take advantage of it, and this is known as the "EU bubble." EU countries have agreed on a division of responsibility that includes a wide variation in countries' target emissions, from -28% for Luxembourg and -21% for Denmark and Germany, to +25% for Greece, and +27% for Portugal.
[1943] See also, Oberthur & Hermann, The Kyoto Protocol: International Climate Policy for the 21st Century.
[1944] Ibid.
[1945] This system has led to the creation of an "international carbon market" - so named because carbon dioxide represents the principal greenhouse gas. See also, Trade and Climate Change, A Report of United Nations Environmental Program and World Trade Organization, (WTO Secretariat, Switzerland, 2009).
[1946] The European Union introduced, in January 2005, the world's largest greenhouse gases emission trading scheme (the EU-ETS), which currently covers more than 10,000 installations in the energy and industrial sectors that are collectively responsible for about half of the EU's emissions of CO2., European Commission, (2008), Question 1.
[1947] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Article 17.
[1948] The provision states that "[a]ny such trading shall be supplemental to domestic actions" for the purpose of meeting Article 3 commitments, which leaves ambiguous the degree to which countries may meet their commitment through purchasing. See, Kyoto Protocol: Article 17.
[1949] Ibid.
[1950] Ibid.

reduction benefits and pollution burdens.[1951] Another short-coming that has been identified in relation to the cap posits that besides the domestic inefficiencies, it has been blamed for causing, an international and transboundary shortcoming. A major problem has to do with the fact that the cap is based on consent in that it only applied to countries that have accepted it. As such, transnational corporations may relocate to those regions, mainly developing countries, where there will be no restrictions.[1952] The above-discussed institutions of the Framework Agreement also serve a dual function as institutions of the Protocol. For instance, the COP serves as the meeting of the parties to the Kyoto Protocol (CMP)[1953] and the UNFCCC's Secretariat.[1954]

[1951] One of the criticisms, for instance, has to do with the fact that when the granting of initial credits is based on the history of emissions (as happened under the European trading system) rather than on a bidding process to acquire initial credits, actors that are heavily polluting at that time are assigned with more credits and, therefore, compensated for their negative impact on climate change.

[1952] See, Caesens and Rodríguez, Climate Change and the Right to Food: A Comprehensive Study, 77; A. Kaswan, "Environmental Justice and Cap-and-Trade," The Environmental Forum (2008). This type of action pushes developing countries to a non-climate-friendly economy, which in the long run makes it harder for those countries to commit to a GHG emissions limit.

[1953] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Article 15.

[1954] Ibid, Article 14.

7. A Farfetched Vision for Consensus: The Paris Climate Agreement

The discussion below will succinctly explore a latest climate agreement, the Paris Climate Agreement, by focusing on its main provisions. The Paris Climate Agreement[1955] has been hailed as one of the most comprehensive climate agreements that has received international consensus.[1956] This optimism has been a result of the fact that the agreement brought together major emitters of GHGs in the atmosphere, notably the U.S. and China, into cooperation. As such, the signing of the Agreement was heralded as a great leap forward[1957] in that it was able to garner broad international support from around the world.[1958]

The Paris Agreement was adopted by consensus on December 12, 2015. Subsequently, it was opened up for signature on April 22, 2016, at a ceremony of World Earth Day in New York.[1959] At the venue, the Agreement was signed by 174 States, including the EU.[1960] Since then, it has been ratified by 181 countries while 197 Countries are parties to it. The Paris Agreement entered into force on November 4, 2016.[1961]

The prelude for the negotiations began years before the agreement was concluded as already stated above. Since 2005, negotiations were already on display which deliberated on what to do after the Kyoto Protocol's first commitment period has come to a conclusion.[1962] Notwithstanding the agreement on this end, differences ensued in that while developing

[1955] Paris Agreement (Dec. 13, 2015), in UNFCCC, COP Report No. 21, U.N. Doc. FCCC/CP/2015/10/Add, 1, Jan. 29, (2016). The Paris Agreement was adopted at the 21st climate conference (COP21) in Paris on December 12, 2015. It was the culmination of a string of annual climate conferences that defined the mandate for the Paris Agreement and advanced work on a great many more technical issues underpinning the international climate process. Notably, the Durban conference in 2011 picked up the pieces from the failed Copenhagen conference and adopted a mandate "to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties"- the Durban Platform for Enhanced Action. The Lima conference in 2014 adopted the "Lima Call for Climate Action" that triggered the process for submitting and reviewing intended nationally determined contributions (INDCs) ahead of the Paris conference. See, Clemencon, "The Two Sides of the Paris Climate Agreement: Dismal Failure or Historic Breakthrough?,".

[1956] Blau, The Paris Agreement: Climate Change, Solidarity and Human Rights.

[1957] Joby Warrick & Chris Mooney, 196 Countries Approve Historic Climate Agreement, WASH. POST, (December 12/ 2015). Available at https://www.washingtonpost.com/news/energy-environment/wp/2015/12/12/proposed-historic climate-pact-nears-final-vote/; Coral Davenport, Nations Approve Landmark Climate Accord in Paris, New York Times, (December 13, 2015); Fiona Harvey, Paris Climate Change Agreement: The World's Greatest Diplomatic Success, GUARDIAN (December 14 2015), Available at http://www.theguardian.com/environment/2015/dec/13/paris-climate-deal-cop diplomacy-developing united-nations; Thomas L. Friedman, "Paris Climate Accord Is a Big, Big Deal," New York Times (December 16, 2015).

[1958] Efforts to join the agreement accelerated especially after China and the United States officially joined the Agreement on September 3, 2016. See, for example, Daniel Bodansky, "The Paris Climate Change Agreement: A New Hope?," The American Journal of International Law Vol. 110 (2016):269.

[1959] Blau, The Paris Agreement: Climate Change, Solidarity and Human Rights; Paris Agreement (Dec. 13, 2015), in UNFCCC, COP Report No. 21, Addenum, at 21, U.N. Doc. FCCC/CP/2015/10/Add, 1, Jan. 29, (2016).

[1960] Blau, The Paris Agreement: Climate Change, Solidarity and Human Rights.

[1961] The Paris Agreement entered into force, 30 days after the so-called "double threshold", i.e., ratification by 55 countries that account for at least 55% of global emissions, had been met. However, on June, 1st, 2017, President Donald Trump has announced that the U.S. would leave the agreement and in August 2017, the State Department had indicated this desire in its communication sent to the United Nations. See, Paris Agreement (Dec. 13, 2015), in UNFCCC, COP Report No. 21, Addenum, at 21, U.N. Doc. FCCC/CP/2015/10/Add, 1, Jan. 29, (2016)

[1962] Bodansky, "The Paris Climate Change Agreement: A New Hope?," 269.

countries wanted the continuation of the Kyoto system through the introduction of a new commitment period, developed countries that had mandatory emission reduction commitments as part their Kyoto obligations, showed hesitation.[1963] Instead of being bound by obligations similar to the Kyoto emission targets, which did not apply to the largest emitters of GHGs like China and the U.S., they advocated for a global approach.[1964]

The most noteworthy positive outcome of the Paris negotiations has to do with the acceptance of more ambitious goals than before regarding global temperature. In this regard, the Agreement vows to keep global temperature rise to below 2 degrees Celsius above pre-industrial levels.[1965] In an ambitious effort to this end, it additionally aims to limit global temperature rise to 1.5 degrees Celsius.[1966] Moreover, even though the Paris Agreement has not been successful in putting in place, specific reduction obligations, it has specified the long-term objective to, "achieve a balance between anthropogenic emissions by sources[1967] and removals by sinks of GHGs in the second half of this century"[1968] being the first time in which such a target has been set, albeit in a general manner.[1969]

Aside from this, similar to other climate change agreements that preceded it, UNFCCC and its Kyoto Protocol, the Paris Agreement cautions on the urgent need to combat climate change by calling upon the State Parties to adapt to its adverse effects.[1970] In this regard, the agreement

[1963] Ibid.

[1964] Ibid; European Commission, Winning the Battle Against Climate Change, COM(2005) 35 final (February 9, 2005); Cancún Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention, Dec. 1/CP.16 (December 10-11, 2010), in COP Report No. 16, Addendum, UN Doc. FCCC/CP/2010/7/Add.1 (March 15, 2011), Bali Action Plan, Decision 1/CP.13 (Dec. 14–15, 2007), in COP Report No. 13, Addendum, at 3, UNDoc. FCCC/CP/2007/6/Add.1 (reissued March 14, 2008)., Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, Decision 1/CP.17 (Dec. 11, 2011), in COP Report No. 17, Addendum, at 2, UN Doc. FCCC/CP/2011/9/Add.1 (March 15, 2012), As such, negotiations started on the two-tracks, one to consider an amendment to the Kyoto Protocol establishing a second commitment period that started in 2005, the other to promote "long-term cooperative action" under the UNFCCC in 2009. Both tracks were to conclude at the 2009 Copenhagen Conference. However, the Copenhagen Conference ended in acrimony and disappointment because the Copenhagen Accord that was adopted created more of a political than a legal commitment. This was followed by 2010 Cancun Agreements that formally incorporated the main elements of the Copenhagen Accord into the regime, including the pledges made by countries to reduce their UNFCCC emission. Nevertheless, the fact that the firstly, the Cancun Agreements were to apply only to 2020 led the question open concerning what to do after this period and the lack of decision on whether to extend the Kyoto Protocol beyond 2012, gave way for the start of the Durban Process in 2011. The Durban Platform for Enhanced Action, which launched the negotiations leading to the Paris Agreement, resolved these issues through a finely balanced compromise among the chief negotiating blocks. On one side, the European Union and other states with Kyoto targets that agreed to a second Kyoto commitment period, which they formally adopted the following year in Doha. In exchange, China, India, Brazil, and South Africa accepted a mandate to negotiate a new instrument with "legal force" to apply from 2020. Given that the mandate applied to all the Parties, both developing and developed, the U.S. was also on board. Small island and other vulnerable states succeeded in establishing a separate work stream focusing on increasing pre-2020 mitigation ambition.

[1965] Paris Climate Agreement: Article 2.

[1966] Ibid; Bodansky, "The Paris Climate Change Agreement: A New Hope?,".

[1967] According to the UNFCCC, Article 1(9), "Source" implies any process or activity that releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere.

[1968] Paris Climate Agreement: Article 4; Bodansky, "The Paris Climate Change Agreement: A New Hope?," 269.

[1969] Paris Climate Agreement: Article 4. Even though the Paris Agreement has failed in specifically alienating specific targets for emission reduction, given the global warming ceiling specified in Article 2, most scientists interpret this to mean that global net emissions need to reach zero by 2060-2080.

[1970] Kyoto Protocol: Article 14.

has put in place binding commitments on the State Parties to prepare, communicate and maintain nationally determined contributions (NDC) by granting them the leeway to undertake domestic measures to meet NDCs.[1971] In line with the afore-discussed UNFCCC, the agreement puts a burden on developed countries to take the lead by undertaking broad reduction targets overtime while developing countries are only expected to enhance their mitigation efforts.[1972] The provision specifically states, in this regard, that the Agreement seeks to address the significant, "gap between the aggregate effect of Parties' mitigation pledges in terms of global annual emissions of greenhouse gases by 2020 and aggregate **emission pathways consistent with holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels**" (emphasis added).[1973] In order to attain this goal, the agreement calls on the parties to, as soon as possible, aim so as to reach a global peaking of GHGs.[1974] Peaking of GHGs aims to achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs.[1975] For this reason, the agreement gives recognition to the possibility that developing countries will need more time for peaking. Therefore, it can be attested that even though the State Parties did not adopt more specific reduction commitments to be below 2010 levels by 2050[1976], when this provision is read in conjunction with Article 2, which has set a global warming ceiling, this provision has been interpreted to mean that by 2060-2080 net global emission needs to reach zero.[1977] In relation to financing, the agreement provides that developed country State Parties "shall provide financial resources to support developing countries.[1978] Moreover, this requirement has now been extended to apply to "other parties that are encouraged"[1979] to provide such support on a voluntary basis.

Notwithstanding the inclusion of new target when it comes to limits on global temperature, the Paris Agreement has gone a step back especially in view of putting in place mandatory emission reduction commitments based on fair and equitable burden sharing. As a result of this, the agreement has abandoned historic country considerations as a baseline for binding reduction commitments.[1980] In a similar vein, the agreement has been considered "weaker on

[1971] Paris Climate Agreement: Article 4. In this regard, it prescribes that Parties shall communicate their NDCs every 5 years and provide information necessary for clarity and transparency. To set a firm foundation for higher ambition, each successive NDC will represent a progression beyond the previous one and reflect the highest possible ambition.
[1972] Ibid, Article 4(4). The provision reads, developing countries should continue enhancing their mitigation efforts, and are encouraged to "move over time toward economy-wide emission reduction or limitation targets in light of different national circumstances".
[1973] Ibid, Article 2.
[1974] Ibid, Article 4.
[1975] Ibid.
[1976] Clemencon¸ "The Two Sides of the Paris Climate Agreement: Dismal Failure or Historic Breakthrough?,".
[1977] Ibid.
[1978] Paris Climate Agreement: Article 9.
[1979] Ibid.
[1980] Clemencon¸ "The Two Sides of the Paris Climate Agreement: Dismal Failure or Historic Breakthrough?,".

the long-term global goal, adaptation policy, compensation for loss and damage, and technology transfer".[1981]

[1981] Ibid; Paris Agreement: Articles 8 -10; UNFCCC: Climate Finance, United Nations, Climate Change, Available at, https://unfccc.int/topics/climate-finance/the-big-picture/climate-finance-in-the-negotiations, Accessed on 23/11/2018. Specifically, Article 9 of the Paris Agreement, provides that developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention leaving other parties to do so on a voluntary basis. Moreover, as part of a global effort, it provides that developed country Parties should continue to take the lead in mobilizing climate finance from a wide variety of sources through a variety of actions, cognizant of the significant role of public funds, including supporting country-driven strategies, and taking into account the needs and priorities of developing country Parties. Such mobilization of climate finance should represent a progression beyond previous efforts.

8. Poker Faced: Agriculture and Climate Change

With the above discussion, which explored the international environmental legal framework, in mind, the sections below will bring the discussion into context by analyzing how the realization of the right to adequate food is being impaired by the above-discussed climate change-induced effects. In this regard, the first section assesses the GHG contribution of agriculture as well as the sources of emission. The second section will divulge on the adverse effects posed by climate change on agricultural production. Hence, this sub-section will provide the basis for the main analysis on how the right to food is restrained by climate-induced changes.

8.1. Agriculture's Contribution to Climate Change

As succinctly noted above, the period after the Second World War (WWII), has witnessed the expansion of industrial agriculture that is characterized by a form of production which is, chemically-intensive, dependent on fossil fuels and capitalizes on the utilization of large single-crop farms (as well as animal production facilities).[1982]As such, as a consequence of the form of production it utilizes, as will be explored further, industrial agriculture contributes significantly to climate change.[1983] The underlying reason for this is that industrial agriculture is an employer of a large share of fertilizers and pesticides.[1984] In terms of energy intake as well, industrial agriculture is an extensive user of energy which is ten times more than the energy required for ecological agriculture while it consumes, on average, 10 energy calories for every food calorie produced.[1985] It can be deduced that industrial agriculture contributes a marked share for GHGs which is emitted from agriculture. In line with this, unsustainable agricultural practices, *inter alia*, shifts in land-use, deforestation, as will be seen below, contribute a significant share of agricultural GHG emission.

In this regard, the causes of human-induced /anthropogenic factors of climate change such as that caused by industrial agriculture, as explored above, have led to the emission of GHG in the atmosphere.[1986] This increase in GHG, such as CO2, is not only the result of fossil fuel use which is the largest source of CO2, but also deforestation and non-sustainable agricultural practices.[1987] The upshot of this in terms of hasting climate change has been that, when these GHG gases get accumulated in the atmosphere, as noted, they alter the natural GHG effect as

[1982] See, Chelsea Smith et al., Realizing the Right to Food in an era of Climate Change, (Quaker United Nations Office, Geneva, 2015).
[1983] Ibid; J.A. Foley et al., "Solutions for a cultivated planet," Nature 478, (2011) 337-342; Carmen G. Gonzalez, "Climate Change, Food Security, and Agrobiodiversity: Toward a Just, Resilient, and Sustainable Food System," Fordgam Envtl. L. Rev. 493 (2011): 22. Industrial agriculture threatens genetic diversity because it relies on a form of production which utilizes a narrow genetic base and promotes genetic uniformity.
[1984] Gonzalez, "Climate Change, Food Security, and Agrobiodiversity,".
[1985] Herren HR, Binns P, et al., UNEP Green Economy Report: Agriculture. (UNEP, Geneva, 2011).
[1986] IPCC, "Climate Change 2007: Synthesis Report," Summary for Policymakers, an assessment of the IPCC (2007).
[1987] Ibid.

a result providing a likely scenario for global warming. Given this general overview, what are the possible sources of GHG emission emanating from agriculture?

An examination of agricultural emission of GHS would reveal that there appear noticeable differences in the light of the sources from which the emissions stem from as well as the respective percentage share of their emission. As a case in point, for instance, CO2 emission from agriculture account to about 19 percent GHG, while the utilization of fertilizers in agriculture is responsible for the emission of 46 percent of nitrous oxide (N2O).[1988] Moreover, according to the IPCC[1989], for the period 1990-2005, the GHS of agricultural emissions of methane and nitrous oxide grew by 17 percent as a result of global increases in the volume of cereal production. This said, however, the rise in global production has not been met with an equitable increase in the global production of cereals.[1990] Hence, the study estimates that as a consequence of increasing levels of production, GHS emission emanating from agriculture is expected to rise up to 35-56% by 2030 mainly as a result of population growth and changing diets towards ruminant meat and dairy products.[1991] For this rise in GHG emission in agriculture and expected peaks in the future, developing countries are going to be major contributors. For instance, as of 2005, developing countries have contributed to one-fourth of methane and nitrous oxide emissions.[1992]

With this in mind, what are the main sources of GHG emission that stem from agriculture? In terms of global GHS emission, the agricultural sector is responsible for close to 13-15 percent of GHS.[1993] Nevertheless, the percentage rises up to 30-32% if the calculation is inclusive of all manmade GHS emissions.[1994] More specifically, the largest share of GHS emission in agricultural production is mainly dominated by the emission of the anthropogenic gases, CO2,

[1988] FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security, 34-38. According to a 2016 study by FAO, even though the share of nitrous oxide in total emission is small, agriculture, fuel and other land use is small, still account for as much as 75 percent of global anthropogenic emissions of the gas.
[1989] IPCC, Climate Change 2007: Mitigation of Climate Change. Working Group III Report of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (2007): 499.
[1990] Ibid, 63. These GHG emissions are predicted to rise by 35–60 per cent by 2030 in response to population growth and changing diets in developing countries, in particular towards greater consumption of ruminant meats and dairy products, as well as the further spread of industrial and factory farming in developed and developing countries.
[1991] See, Ulrich Hoffman, Agriculture at the Crossroads: Assuring Food Security in Developing Countries under the Challenge of Global Warming, (UNCTD, Trade and Development Review, 2013): 21-25; FAO, Livestock's Long Shadow, (FAO, 2006). One of the effects of this will be that more forest will be cleared to grow feed and provide pasture – activities already thought to be responsible for around 7% of global greenhouse gas emissions. The production of meat and dairy is responsible for the majority of agricultural methane emissions. This is because, as meat consumption increases methane emissions from livestock are predicted to rise by up to 60 per cent by 2030. The animals themselves release most of the methane by enteric fermentation during digestion, and the rest comes from the manure they produce. Additionally, livestock rearing also accounts for over half of man-made nitrous oxide emissions. A common trend in livestock intensification is the use of animal feed instead of allowing animals to graze. Nitrous oxide is released by the fertilizer used to grow the feed, by the manure and urine produced by the animals, and from the storage of manure in intensive rearing systems.
[1992] Hoffman, Agriculture at the Crossroads, 21-25.
[1993] Schutter, Climate Change and the Human Right to Adequate Food: Contribution of the Special Rapporteur on the right to food.
[1994] Ibid.

methane (CH4) and nitrous oxide (N2O).[1995] What this connotes according to estimates[1996] is that, if one only considers emission at the level of production, agriculture contributes close to 13-15 percent of global GHS emissions. The percentage shows that for the agricultural sector - crops, livestock, fisheries, forestry - which occupies the 4th largest global share of Gross Domestic Product (GDP)[1997], its share of GHS emission is large. Nevertheless, this percentage is not inclusive of indirect emission emanating from the production of agricultural inputs and fixed capital equipment, processing and the trade of agricultural products as well as land conversion to agriculture.[1998] As noted above, agriculture's GHS contribution rises to approximately 30–32 percent when land-use changes, land degradation and deforestation that are upshots of agricultural production are to be included.[1999]

In this regard, agriculture contributes for the emission of the GHS, CO2,[2000] due to deforestation which is undertaken for the purpose of pasture, crop cultivation and shifts in land use, amounting in total to close to 19 percent of GHS emissions.[2001] Moreover, unsustainable agricultural practices such as deforestation and forest degradation are responsible for the emission of carbon through the decomposition of aboveground biomass, peat fires and decay of drained peat soils.[2002] In this regard, the clearing of forested area[2003] for agriculture constituted for 17.4 percent of total GHG emissions in 2000, with emissions from intensive crop and livestock production contributing another 13.5 percent.[2004] This shows that a major source of CO2 emission in the agricultural sector is land conversion of

[1995] Ulrich Hoffmann, Assuring Food Security in Developing Countries under the Challenges of Climate Change: Key Trade and Development Issues of a Fundamental Transformation of Agriculture, No. 201, (UNCTD, 2011).
[1996] Ibid.
[1997] T. Lybbert and D. Sumner, Agricultural Technologies for Climate Change Mitigation and Adaptation in Developing Countries: Policy Options for Innovation and Technology Diffusion, (ICTSD and International Food & Agricultural Trade Policy Council, Issue Brief No. 6, Geneva, 2010): VI.
[1998] Hoffmann, Assuring Food Security in Developing Countries under the Challenges of Climate Change.
[1999] R. DeFries and C. Rosenzweig, Toward a whole landscape approach for sustainable land use in the tropics. Proceedings of the National Academy of Sciences, No. 107, (USA, 2010):19627-19632.
[2000] The use of fossil fuels is responsible for a staggering 75 per cent of global GHS emission of Co2 being the largest contributor of GHS used for energy. See, FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security, (FAO, Rome: Italy 2016):34-38, & Red Sugar Green Deserts, (FIAN International, FIAN Sweden, HIC-AL, and SAL, 2009): 80
[2001] Beverly D. McIntyre, et al., International assessment of agricultural knowledge, science and technology for development (IAASTD): synthesis report with executive summary: a synthesis of the global and sub-global IAASTD reports, (IAASTD, Washington DC, 2009): 46ff; FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security, 80. CO2 emissions from agriculture equate to about 9 percent of the global total of anthropogenic emissions, with the rest contributed by methane (2.5 Gt CO2e per year) and nitrous oxide (2.7,Gt CO2e per year). Moreover, CO2, which produces between 65 and 70% of the total greenhouse effect, only half of the emission is absorbed by land and marine ecosystems, and the rest accumulates in the atmosphere, aggravating climate change.
[2002] FAO, Climate Change and Food Security: A Framework Document, (FAO, Rome, 2008): 63ff.
[2003] In this regard, a latest research that looked into how far deforestation can progress before the rainforests water cycle would seize to support ecosystems, has disclosed that “If the climate changes any further, as a consequence of deforestation or global warming, that there is a significant risk in that more than 50% of the Amazon forest becomes a degraded savannah". This connotes that it would just take an additional three percent to render the rainforest unsalvagable., Chelsea Gohd, World Economic Forum, The Amazon is Reaching a Point of No Return - but It's Not Too Late, 26 February, 2018, Accessed on 26/11/2018. Available at,https://www.weforum.org/agenda/2018/02/the-amazon-might-be-past-the-point-of-being saved/?fbclid=IwAR3X64Lhjpy8csnN0mUkP4JlEyqciq3zLvK06igvZPSVRw8M-VMpn8bwmdM
[2004] FAO, Climate Change and Food Security: A Framework Document, 63ff.

forested areas into cultivated or grazing land.[2005] As a consequence of this, to date, close to 50% of the world's surface land area has been converted for grazing and crop cultivation resulting in a loss of more than half of the world's forests.[2006]

Correspondingly, agriculture is moreover responsible for the emission of the anthropogenic gases methane and nitrous oxide. These GHS are released, respectively, from cattle and rice paddies as well as from the use of synthetic fertilizers, accounting respectively for 35 percent and 65 percent of total anthropogenic GHG emissions.[2007] With respect to the GHG methane, which has a warming potential that is 20 times more powerful than CO2[2008], it is released, firstly, from the digestive processes and wastes from ruminant livestock that eat a great deal of fibrous material which is an important source of methane. These ruminant animals, such as cattle, sheep, and goats, through the process of enteric fermentation, as such, release unused carbon in the form of methane during the digestion process of fibrous materials in the diet.[2009]

Secondly, methane is released from animal manure. These sources of emission account together for 60 percent of agricultural emissions of methane and about 30 percent of total anthropogenic methane emissions.[2010] A considerable amount of methane is also released from rice production which accounts for almost 40 percent of agricultural methane emissions and 20 percent of all human-caused methane emissions.[2011]

Parallel to this, the emission of nitrous oxide in the agricultural sector is a result of, on the first hand, an increase in the employment of synthetic nitrate-based fertilizers that are used with the aim of boosting crop yields, and on the second hand, from more intensive farming practices.[2012] Consequently, when the application of a large amount of these synthetic fertilizers is combined with irrigation practices that drench soils, the lack of oxygen in the soil will create the condition favorable for the anaerobic conversion of solid nitrates and nitrites into nitrogen-containing gases (denitrification).[2013] Hence, this will lead to the release of nitrous oxide into the atmosphere. Moreover, Nitrous oxide is released from agricultural soil produced from an extensive and poorly controlled use of animal waste as fertilizer. This is due to the fact that the ammonia in urea-based fertilizers and manures is vaporized when exposed to the air.[2014] In this regard, N2O is also linked to the release of nitric oxide and

[2005] Ibid.
[2006] Ibid
[2007] Hoffmann, Assuring Food Security in Developing Countries under the Challenges of Climate Change; Hugh Turral, et al., Climate Change Water and Food Security, FAO Water reports, No. 46, (FAO, Rome Italy).
[2008] Jelle Bruinsma, World Agriculture Towards 2015/2030: A FAO Perspective, (FAO, Rome, Italy, 2003): 348.
[2009] FAO, Climate Change and Food Security: A Framework Document, 63ff.
[2010] Ibid; J. Webb, Sven G. Sommer, et al., Emissions of Ammonia, Nitrous Oxide and Methane During the Management of Solid Manures, in Agroecology and Strategies for Climate Change, Sustainable Agriculture Reviews, (E. Lichtfouse ed.), (Springer Science+Business Media B.V., 2012): 67ff.
[2011] FAO, Climate Change and Food Security: A Framework Document, 63ff.
[2012] Ibid. Webb & Sommer, et al., Emissions of Ammonia, Nitrous Oxide and Methane During the Management of Solid Manures, 67ff.
[2013] Ibid.
[2014] Ibid.

ammonia, which contribute to acid rain and the acidification of soils and drainage systems.[2015] According to a projection by the FAO, as a result of increased nitrogen fertilizer use and increased animal manure production, N2O emissions from agriculture are projected to increase by 35-60% up to 2030.[2016]

A recent study[2017] released by the FAO corroborated this by highlighting that, in 2014, emission related to methane (CH4) accounted for 45 percent as well as emissions from agriculture, forest and other land use (AFOLU) stood at 10.6 gigatonnes (Gt) of carbon dioxide equivalent. From this percentage, the anthropogenic gases CO2 and methane respectively accounted for 49 and 30 percent of emissions generated by agriculture along with forestry and land use. This shows that the sector, in general, is responsible for 14 percent of total anthropogenic emissions of carbon dioxide and 42 percent of all methane emissions.[2018]

As such, agricultural production is not only a victim of climate-induced changes, as will be discussed below, but also contributes a fare-share of GHS emissions especially in terms of CO2, nitrous oxide and methane.

8.2. Agriculture Stricken by Climate Change

The discussion below will explore how agriculture, on the flip-side, is negatively affected by climate-induced changes. It can be attested that even though climate change has adverse effects that have far-reaching effects, which extend throughout the world, it is, however, conceivable that not all regions of the world experience its adverse effects in a similar way. This is because the likely effects are for the most part to be widespread on vulnerable ecosystems, populations, and regions. With regard to most vulnerable regions, the effect of climate change will be much severe in tropical regions while temperate regions are likely to experience positive effects[2019] mainly as a result of the CO2[2020] fertilization effect of

[2015] Bruinsma, World Agriculture Towards 2015/2030: A FAO Perspective, 348ff; A. Mosier, & C. Kroeze, "A new approach to estimate emissions of nitrous oxide from agriculture and its implications for the global change N2O budget," IGBP Global Change Newsletter, 34 (1998): 8-13.

[2016] FAO, World Agriculture: Towards 2015/2030. An FAO Perspective, (FAO, Rome, 2003); Smith, et al., Agriculture in Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. And considering that demands for food increase, and diets shift as projected, then annual emissions of GHGs from agriculture may escalate even further.

[2017] FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security, 34-38.

[2018] Ibid. According to this study, Enteric fermentation is the largest source of emissions from agriculture in all regions except Oceania and Eastern and Southeast Asia, with the share of total emissions ranging from 58 percent in Latin America and the Caribbean to 37 percent in countries in developed regions. The second main source is manure left on pastures in sub-Saharan Africa, Northern Africa and Western Asia, and Latin America and the Caribbean; rice cultivation in Southern Asia; and synthetic fertilizers in countries in developed regions.

[2019] See, William R. Cline, Global Warming and Agriculture: Impact Assessment by Country, Center for Global Development, Peterson Institute for International Economics, (Washington, DC 2007). Higher temperature (between 1-3 degree Celsius) is expected to boost crop productivity in some regions due to lengthened growing seasons, reduced frost damage, and enlarged root surface areas under warmer soil temperatures that may facilitate increased nutrient uptake.

increased GHG concentrations in the atmosphere.[2021] These regions are constituted by those countries in sub-Saharan Africa and Asia (Western and South East Asia) which are the most food insecure.

Likewise, the adverse effects will be more visible on regions of the world which are most dependent on the export of agricultural commodities.[2022] Therefore, regions, where the export of agricultural commodities constitutes a major share of the national GDP and the sector is an important source of revenue will be highly vulnerable.[2023] In this regard, according to estimates[2024], as a result of climate change, countries most dependent on agriculture face an estimated loss of more than fifty percent of their total agricultural output by 2080. This expected fall in production is likely to take place even when including carbon fertilization effects - where an increased concentration of carbon dioxide in the atmosphere acts as a stimulus to crop productivity.[2025] With regard to terrestrial ecosystems that are most susceptible to the adverse effects of climate change include for instance boreal forests, the Amazon rainforest, and Arctic tundra.[2026]

Likewise, not all sectors will be affected alike. This is because, climate change will affect those sectors, agriculture, livestock, fisheries, whose production process relies on climatic conditions.[2027] Taking the agricultural sector, as a case in point, it is evident that climate change will lead to a decline in the supply of food both domestically and globally. As will be elaborated more subsequently, even though in the short-run, higher yields in temperate regions (notably North America, Russia, and China) are expected to offset declines in tropical regions through trade, the ramification will be more pronounced on low-income countries that have high reliance on domestic food production and have low capacity to trade.[2028] This is, however, notwithstanding the expected decline in the production of major cereals, wheat, maize, rice, which is likely to take place in a number of developing countries as a consequence resulting in the loss of close to 16 percent of national GDP.[2029] A study conducted by FAO[2030], in this regard, has noted that climate change is already undermining the production of major crops, wheat, rice, and maize, both in tropical and temperate regions.

[2020] Carbon dioxide is an input in photosynthesis, which uses solar energy to combine water and carbon dioxide to produce carbohydrates, with oxygen as a waste product. See, Cline, Global Warming and Agriculture. Carbon dioxide is an input in photosynthesis, which uses solar energy to combine water and carbon dioxide to produce carbohydrates, with oxygen as a waste product.

[2021] FAO, Climate Change and Food Security: A Framework Document, 25. This is due to the consideration that higher atmospheric concentrations of carbon dioxide reduces plants' stomatal (pore) openings and the loss of water to respiration. In this regard, so-called C3 crops, which include rice, wheat, soybeans, fine grains, legumes, and most trees, are likely to benefit substantially from additional atmospheric of carbon dioxide.

[2022] Swanson, Eric. "World development indicators 2007", (Washington, DC: World Bank. 2007).

[2023] Ibid.

[2024] Ibid.

[2025] Ibid.

[2026] Lenton et al., Tipping elements in the Earth's climate system. Proceedings of the National Academy of Sciences of the United States, 1786-1793.

[2027] FAO, Climate Change and Food Security: A Framework Document, 25ff.

[2028] Ibid.

[2029] See, FAO Committee on Food Security, Report of 31st Session 2005, CFS:2005/2.

[2030] The study has cautioned however that without adaptation, the current reduction in productivity is expected to worsen as temperatures increase and become more extreme. See, FAO, IFAD, UNICEF, WFP and WHO, The

Additionally, populations most affected by climate change, include those people who live in the above-discussed areas that are most vulnerable to climate change. Accordingly, smallholder farmers, pastoralists, traditional societies, indigenous people and coastal populations are most vulnerable.[2031] Their vulnerability emanates from their low income and lack of capacity for undertaking adaptation. They are often politically marginalized, risk-averse, and may have little or no access to social protection programs or healthcare.[2032]

Consequently, the abovementioned effects of climate change in relation food production, will at the same time lead to the inaccessibility of food especially for producers that are less able to deal with climate change, such as the rural poor in developing countries who risk having their safety and welfare compromised.[2033] The section below will start off with a general discussion of how climate change is likely to affect the agricultural sector. This will be followed by an analysis of how the realization of the right to adequate food will be restrained by climate change. In this regard, the section will assess how food availability, as well as accessibility, are adversely compromised as a result.

8.2.1. Climate Variability

One of the most observable direct effects of climate change on agriculture is related to the occurrence of higher rates of climate variability[2034] which can be defined as "...seasonal, annual, interannual or several years- long variations in temperature and precipitation around an average condition defined over several decades".[2035] The underlying reason for this has to do with the fact that climate change causes instability in seasonal weather patterns. Consequently, such a disturbance in weather patterns may, for instance, alter the start and end of crop growing seasons. The effect of climate variability as such will directly lead to, *inter alia*, "...to an earlier timing of spring events, including earlier leaf unfolding..."[2036] The resulting impact caused by the variability of climate will nevertheless depend on geographic

State of Food Security and Nutrition in the World 2018: Building climate resilience for food security and nutrition, (FAO Rome, Italy 2018): 36ff; Intergovernmental Panel on Climate Change (IPCC), Climate Change 2014: Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (R.K. Pachauri and L.A. Meyer, eds], (Geneva, Switzerland, 2014).

[2031] W. E. Easterling et al., Climate change 2007: Impacts, adaptation, and vulnerability (Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change), (Cambridge University Press, Cambridge, UK: 2007): 273 -314.

[2032] Ibid.

[2033] FAO, Climate Change and Food Security: A Framework Document, 25ff.

[2034] Christoph Bals et al., Climate Change, Food Security and the Right to Adequate Food, (Stuttgart, Germany, 2008):72-73.

[2035] IPCC, Climate change 2007: Working Group II: Impacts, adaptation and vulnerability, (Washington DC, United Nations Intergovernmental Panel on Climate Change 2007); R. T. Wetherald, and S. Manabe, Simulation of hydrologic changes associated with Global Warming, Journal of Geophysical Research- Atmospheres, (2002): 107; Molly E. Brown, Food Security, Food Prices and Climate Variability, (Earth Scan, Routledge, New York and London 2014).

[2036] See, Rosenzweig et al., Assessment of observed changes and responses in natural and managed systems, 79-131.

location. This is because, as noted above, temperate regions notably, North America, Russia, and China, will encounter positive results emanating from longer growing seasons, while tropical regions where the start of the growing season for crops is directly related with rainfall, will be most affected.[2037] According to the IPCC[2038], the amount of precipitation will also vary. For instance, it will likely be higher in high latitudes, while in most subtropical land regions the level of precipitation is predicted to decline owing to a general intensification of the global hydrological cycle. This can directly be translated to mean that levels of annual precipitation in those countries, to be found in Europe and Africa, which are geographically closer to the Mediterranean, will decrease. [2039]

As a result of this, it will become much more difficult to grow crops that demand sufficient rainfall. This is especially problematic due to the fact that most land used for agriculture is still rain-fed leaving aside a small percentage, 16%, of the land that has been irrigated.[2040] This means that 40 percent of global agricultural harvest takes place on this irrigated land.[2041] Climate variability will hence pose a negative threat on precipitation mainly for all non-irrigated land. This is due to the fact that higher temperatures that have resulted from climate change will directly alter rainfall patterns leading to higher levels of evaporation.[2042] As such, as most water will be in the atmosphere due to higher evaporation, the level of precipitation will be higher as a result of climate change.[2043] Therefore, due to higher level precipitation leading to unpredictability in rainfall patterns, farmers will have a hard time to produce the crops they are used to as will be assessed subsequently.[2044] Nonetheless, sub-Saharan Africa will experience a decline in precipitation which is estimated at 20%.[2045] As a consequence of this decline in precipitation and increasing temperature, the sub-region will experience the loss of arable land.[2046] Nevertheless, even though practices such as shifting production will have produced a solution, the fact that there is an absence of information on the expected changes, as well as the lack of necessary resources to support shifts in production, will highly expose these farmers to the negative effects of climate variability.[2047] As will be examined in more detail afterward, the effect of this will be manifested, in terms of decreasing levels of

[2037] Bals et al., Climate Change, Food Security and the Right to Adequate Food.
[2038] See, Solomon, S., Qin, D., et al.,. Technical summary. In Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.(Solomon, S., Qin, D, et al, (eds), (Cambridge University Press, Cambridge and New York, 2007).
[2039] This said however, extremes of daily precipitation are considered very likely to increase in Northern Europe, Southern and Eastern Asia, Australia, and New Zealand, as well as in many other regions. See, Solomon, S. et al., "Technical summary". in, Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (Solomon, S., et al, eds). (Cambridge University Press, Cambridge and New York, 2007).
[2040] FAO, Food Outlook, (FAO, Rome, Italy 2007a); FAO, Climate change and Food Security: A framework document.
[2041] Ibid. For example, in Africa, only 7 percent of agricultural land is irrigated.
[2042] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 72-73.
[2043] Cline, Global Warming and Agriculture: Impact Assessment by Country.
[2044] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 72-73.
[2045] M.L. Parrya et al., Effects of climate change on global food production under SRES emissions and socio-economic scenarios, Clobal Environmental Change 14, (2004): 53-67.
[2046] Oyiga Benedict et al., Implications of Climate Change on Food Yields and Food Security in Sub-Saharan Africa, (University of Bonn, Center for Development Research, 2011); Bals, et al., Climate Change, Food Security and the Right to Adequate Food", 72-73.
[2047] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 72-73.

yield especially for Sub-Saharan Africa, for instance, where increasing levels of evapotranspiration[2048] will make some agricultural lands unsuitable for cropping as well as that available for pasture.[2049]

The effect of climate change on agriculture additionally affects water availability. This is due to the fact that higher humidity will affect annual river runoff as such affecting water availability.[2050] Specifically, more than 90% of the water required by terrestrial plants, is lost through transpiration than being used for metabolism due to climate variability.[2051] Thus, as a consequence of water shortages, crop productivity and food supply will be restricted to be below the maximum potential in the condition that water supply is less than the demand for water as set by atmospheric conditions.[2052]

8.2.2. Extreme Weather Events

Agricultural production is moreover affected by climate change as a result of extreme weather events. This is due to the recurrence of extreme weather events such as drought, floods[2053], cyclones, storms[2054] which are induced by climate variability.[2055] However, it is important to take into account that not all types of climate, as well as temperature extremes, are easily referable to climate change. This is because, their occurrence can also be linked to periodic or intermittent changes related to different natural phenomena, *inter alia*, El Niño, La Niña, volcanic eruptions[2056], or other changes in the Earth system.[2057] According to the 4th Assessment Report by the IPCC[2058], extreme weather events, such as droughts[2059], floods, and

[2048] Evapotranspiration (the combined loss of moisture from soil through evaporation and plants through stomatal transpiration) increases with temperature. The need for irrigation rises as conditions become drier. It rises as a function of the difference between evapotranspiration and precipitation. Because global warming will increase both temperature and precipitation, the implications for soil moisture and the need for irrigation depend on the outcome of the race between rising temperature and rising precipitation.

[2049] Bals et al. Climate Change, Food Security and the Right to Adequate Food, 72-73; Benedict et al., Implications of Climate Change on Food Yields and Food Security in Sub-Saharan Africa.

[2050] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 72-73.

[2051] Reaping the benefits Science and the Sustainable Intensification of Global Agriculture, (Royal Society, London, 2009): 11ff.

[2052] FAO, 2008B, Intro, Soaring Food Prices: Facts, Perspectives, Impacts and Actions Required, Background Paper Prepared for the High-Level Conference on World Food Security: The Challenge of Climate Change and Bioenergy, (Rome, Italy, 2008).

[2053] In many countries floods are the type of extreme weather events that cause the highest number of deaths. According to the World Development Report, in 2003 and 2004, there were about 140 million affected persons per year. See, The World Bank, World Development Report: Development and Climate Change.

[2054] J.R. Beddington et al. "What next for Agriculture after Durban?," Science 335, (2012): 289–290.

[2055] FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building climate Resilience for Food Security and Nutrition.

[2056] These natural phenomena such as El Niño, La Niña, volcanic eruptions are shorter-term climate variations associated with periodic or intermittent changes.

[2057] FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building climate Resilience for Food Security and Nutrition.

[2058] M.L. Parry, et al, (eds), "Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change", (Cambridge University Press, Cambridge, 2oo7).

storms will become more recurrent, intense and unpredictable, in the years ahead. The report has furthermore, revealed that in regions such as sub-Saharan Africa, South, and Eastern Asia, warming will be higher when compared to other regions.[2060] A recent study by FAO has shown that climate-related extreme weather events have grown substantially in that they now account for more than 80 percent of all internationally reported disasters.[2061] Consequentially, the occurrence of extreme weather events threaten to destroy the land upon which farmers live and harvest on.[2062] For instance, as an illustrative example, climate variability especially the occurrence of extreme flooding and drought have been linked to the decline of economic activity in sub-Saharan Africa.[2063]

Moreover, as a result of these extreme events, people will be forced to relocate from their communities while additionally being pushed to abandon their common agricultural practices as well as sources of food.[2064] In the scenario where local communities leave, as well as, return back to their land where natural resources have been depleted, they will be required to adopt new and unfamiliar means in order to provide for themselves as well as their families.[2065] Therefore, climate change- induced factors such as climate variability and extreme weather events exert a direct effect on the agricultural sector that is heavily reliant on climate conditions.

[2059] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 72-73. The term drought when applied to agriculture refers to Agricultural drought means lower soil moisture. However, it also refers to different factors. For instance, a meteorological drought refers to reduced precipitation, a hydrological drought to reduced river flows and reduced water levels in rivers, lakes and groundwater.

[2060] M.L. Parry, et al, (eds), "Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change", (Cambridge University Press, Cambridge, 2007).

[2061] See, FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition; Centre for Research on the Epidemiology of Disasters (CRED), The Human Cost of Natural Disaster 2015: A Global Perspective, (Brussels 2015).

[2062] Elisabeth Caesens et al., Climate Change and the Right to Food: A Comprehensive Study, vol. 8, (Heinrich-Böll-Stiftung, Colombia Law School: 2009):30-32.

[2063] M. E. Brown, Markets, Climate Change and Food Security in West Africa, Environmental Science and Technology, 43, (2009): 8016-8020; Benedict, et al., Implications of Climate Change on Food Yields and Food Security in Sub-Saharan Africa.

[2064] Caesens et al., Climate Change and the Right to Food: A Comprehensive Study, 30-32.

[2065] Ibid.

9. Repercussions of Climate Change on the Right to Food

A recent study[2066] conducted by FAO has revealed that world hunger is on the rise. Going a step further, the estimate's of the study highlight that the share of undernourished people in the world has been on a constant rise for the past three years reaching 10.9 percent in 2017.[2067] As such, the study has disclosed that an estimated 821 million people – approximately one out of every nine people in the world – living in regions of Africa (mostly in sub-Saharan Africa), South America and Asia (mainly Western and South East Asia), are undernourished.[2068] For this rise in global undernourishment, climate change is predicted to have contributed a large share. Supporting this, a study by the IPCC[2069] has anticipated that considering the climate change scenario and socio-economic development path chosen, climate change is predicted to affect between 34 million to 600 million people that could suffer from hunger by 2080. What these studies highlight is that global hunger - undernourishment - is on a rise and that climate change is going to contribute a significant share for this increase.

As already noted, even though the adverse consequences of climate change are global - in that to different degrees, the phenomenon affects all countries - an assessment of the effect will, however, vary by region, sector, and ecosystem considered.[2070] Similarly, climate change will pose a negative effect on populations differently depending on the level of vulnerability. In this respect, coming specifically to agriculture, climate change will highly impair the predictability of weather conditions that are of crucial importance for the agricultural sector.[2071] The underlying reason behind this is that agricultural production heavily relies on the predictability of local temperatures as well as patterns of precipitation. Acting as an exacerbating factor, all these climate-induced changes are bound to take place at a period when the global demand for food is going to see a rise.[2072] Even though the constraints exerted by climate change on food as well as agricultural production is additionally affected by a range of other drivers of change, including growth in population and income, climate

[2066] FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building climate resilience for food security and nutrition.
[2067] The absolute number of undernourished people in the world is now estimated to have increased from around 804 million in 2016 to almost 821 million in 2017.
[2068] When it comes to the impact this has had on people's livelihood, in 2017, almost 124 million people across 51 countries and territories faced "crisis" levels of acute food insecurity that required immediate emergency action to safeguard their lives and preserve their livelihoods. Compared to the level in 2015-2016, this represents an increase when 80 and 108 million people, respectively, were reported as facing crisis levels. See, FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building climate resilience for food security and nutrition.
[2069] G.W. Yohe et al., Perspectives on climate change and sustainability, in Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (M.L. Parry, O.F. Canziani, et al., eds.) (Cambridge University Press, Cambridge, UK: 2007): 811–841.
[2070] See, FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security, 22ff; IPCC, Methodological and Technological Issues in Technology Transfer, Special Report of Working Group III of the Intergovernmental Panel on Climate Change. Among the developing regions, Southern Asia and Africa would be the most exposed to an increased risk of hunger as a result of climate change.
[2071] See, FAO, Climate Change and Food Security: A Framework Document, 25ff.
[2072] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 52-55.

change is expected to aggravate the impact on food security.[2073] A study by FAO[2074], anticipated, in this regard, that the future global demand for food will increase by some 70% by 2050, while the level is expected to double for developing countries. Accordingly, the main reason behind this predicted rise has to do with population growth in developing countries.[2075] Likewise, a collaborative study conducted by FAO and the OECD corroborates this finding in the prediction of agricultural outlook which covers the period 2011-2020, in that it has conveyed that the rise in demand underlines high and more volatile agricultural commodity prices.[2076] This global rise in demand is caused also by economic growth in developing and emerging economies like India and China. As an upshot of increasing wealth in these developing countries, food preferences and diet will be altered towards more animal products - meat.[2077] In this regard, according to FAO,[2078] the consumption of staple carbohydrates is going to see a decline giving way for an increase in demand for luxury goods, *inter alia*, milk, meat[2079], fruits and vegetables whose production is heavily reliant on irrigation in many parts of the world. As a result of this, more animal products[2080] will be consumed.[2081]

Therefore, taking into account the aforenoted exacerbating factors, to the extent that climate change introduces changes to climate patterns and /or changes the biophysical conditions to which crops are adapted, agricultural production and consequently food security may be impacted.[2082] Given this starting point, the discussion below will attempt to put the discussion

[2073] G.C. Nelson et al., Climate change: Impact on Agriculture and Cost of Adaptation, (Washington, DC, IFPR, 2009).
[2074] See, Hugh Turral et al., Climate Change Water and Food Security, FAO Water Report 36, (FAO, Rome 2011):18; OECD/FAO, OECD-FAO Agricultural Outlook 2011-2020, (OECD Publishing and FAO, 2011). Available at, http://dx.doi.org/10.1787/agr_outlook-2011-en, Accessed on 29/04/2019
[2075] The OECD/FAO outlook predicted the global population to reach for more than nine billion people by 2050 under medium growth projections. See, OECD/FAO, OECD-FAO Agricultural Outlook 2011-2020; FAO, Forestry and Energy: Key Issues, (FAO, Rome, Italy 2008d).
[2076] Ibid.
[2077] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 52-55.
[2078] See, Turral et al., Climate Change Water and Food Security, FAO Water Report 36, 18; OECD/FAO, OECD-FAO Agricultural Outlook 2011-2020.
[2079] Meat production is responsible for the emission of large GHG. In terms of animal feed for example, it takes, on average, 3 kg of grain to produce 1 kg of meat. Additionally, about 16,000 litres of water is needed to produce 1 kg of meat. See, FAO, World Agriculture, Towards 2030/2050, (FAO, Rome 2006).
[2080] FAO, Energy and Gender in Rural Sustainable Development, (FAO, Rome, Italy 2006b). Meat production has many detrimental effects on the environment, apart from being energy inefficient when animals are fed with food-crops. This is so because, the area required for production of animal feed is approximately one-third of all arable land. Dietary shifts towards more meat will require a much larger share of cropland for grazing and feed production for the meat industry. Expansion of land for livestock grazing is a key factor in deforestation, especially in Latin America: some 70% of previously forested land in the Amazon is used as pasture, with feed crops covering a large part of the remainder.
[2081] See, OECD/FAO, OECD-FAO Agricultural Outlook 2011-2020. The study has moreover revealed that, on the demand side, growing populations and rising incomes in the large emerging economies such as China and India will sustain strong demand for commodities. Rising incomes will also drive a shift in diets from staple foods to more value-added and higher protein products, especially for consumers in emerging economies who will increasingly demand meat and dairy products in their consumption choices.
[2082] David E. Sahn, The Fight against Hunger and Malnutrition: The Role of Food, Agriculture, and Targeted Policies, (Oxford University press, Oxford, UK: 2015); FAO, The State Of Food and Agriculture: Climate Change, Agriculture and Food Security, 22ff. According to FAO, future food security concerns are moreover to be also determined by ensuing socio-economic conditions.

into perspective by examining the effect the above-discussed changes have on the realization of the right to food.

9.1. Constraints on Food Availability

The section below will assess the constraints that have been posed by climate change on food availability. The section will attest that the above-explored consequences of climate change, will impinge upon, the realization of the right to adequate to the public.

Drawing on the discussions explored in preceding sections, it is evident that climate change adversely affects the natural resource base, *inter alia*, soil, water, rainfall, on which agriculture depends. In a similar vein, agricultural production on its part contributes negatively to climate change due to its large GHG emissions as explored above. Hence, agricultural production has more than a simple casual relationship with climate change in that to varying degrees agricultural production is a cause and victim of climate change.[2083]

This said any analysis of the impact of climate change on the agricultural sector and on the availability of adequate food must take into consideration a number of inter-related issues. As such, for the agricultural sector specifically in relation to crop production, the state of the environment directly exerts pressure on the availability of, soil nutrient, as well as water (ground and surface water) needed for irrigation.[2084] Moreover, the state of the environment also determines climate and weather conditions, i.e. rainfall and growing season.[2085] In a similar vein, the state of the environment also dictates the abundance of and effects of certain pests, such as pathogens, insects, and weeds that influence global food production and are imperative for pollination.[2086] As such, the state of the environment is notably imperative for agriculture. How are the above-discussed ingredients needed for crop production, restrained by climate change as a consequence reneging on the right to food?

[2083] For more, see, FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building climate resilience for food security and nutrition.
[2084] Pedro A. Sanchez, Soil Fertility and Hunger in Africa, Science 205 (5562):2019-2020; C. Nellemann et al., The environmental food crisis -The environment's role in averting future food crises: A UNEP rapid response assessment, (United Nations Environment Programme, GRID-Arendal 2009): 32ff.
[2085] Ibid.
[2086] Ibid.

9.1.2 Reductions in Yield Constrain Food Availability

The constraints posed by climate change on food availability, are especially to be observable in relation to extreme and variable weather conditions. In this regard, the most direct effect of climate change on food availability is to be seen with regard to reductions in production and yield[2087].[2088] In this light, the effect of climate change is expected to be much severe for countries that have higher initial temperatures, greater climate change exposure, and lower levels of development. In this regard, estimates[2089] have shown that by 2080, in those regions, sub-Saharan Africa and South Asia, that are more exposed to climate change, the effect of climate change will lead to a 15-30% decline in agricultural productivity. In these regions, even a moderate change in climate of 1-2 Degree Celsius will have a negative effect on the yield of major cereals.[2090] In this respect, a 2014 synthesis report carried out by the IPCC, has revealed with "high confidence", based on IT Assessment of many studies covering a wide range of regions and crops, the negative impacts of climate change on the reduction of crop yields.[2091]

This said, however, in some geographic locations, yields may actually increase due to carbon fertilization effect resulting from higher temperature.[2092] This is true especially, in mid to high latitude regions, where local temperature increases between 1-3°C, in tandem with higher CO2 concentration and rainfall changes, can have a small positive impact on major rain-fed crops such as maize, wheat, and rice.[2093] More elaborately, according to models[2094] that predict the effect of higher temperatures on crop yield, the carbon fertilization effect, will take place as a result of higher temperature as a result leading to a rise in total global production given a local temperature rise of 1-3ºC. When the temperature rises above this level by 2050, however, production increases are predicted to drop. A 2014 synthesis report by the IPCC, has highlighted, in this regard, that for crops such as wheat, rice and maize, that are grown in tropical and temperate regions, climate change without adaptation is expected to negatively

[2087] Crop yield in this regard is used to refer to the amount of agricultural production harvested per unit of land area. For more, see, FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building climate resilience for food security and nutrition.

[2088] Brian Thompson & Marc J. Cohen, The Impact of Climate Change and Bioenergy on Nutrition, (FAO, Springer, 2012).

[2089] Cline, Global Warming and Agriculture: Impact Estimates by Country; Yohe et al., Perspectives on Climate Change and Sustainability. For some of the countries in these regions, as a consequence of climate change, agricultural productivity may decline by up to 50%.

[2090] Easterling et al., Food, Fibre and Forest Products; Bals et al., Climate Change, Food Security and the Right to Adequate Food.

[2091] IPCC, Climate Change 2014: Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (R.K. Pachauri and L.A. Meyer eds.), IPCC, Geneva, Switzerland, (2014): 25ff.

[2092] FAO, The State of World Forests, (FAO, Rome, Italy, 2011). There is also strong evidence that climate variability driven by major ENSO events associated with El Niño plays a key role in decreasing crop yields. For more, see, J. Hansen, S. Mason, et al., Review of seasonal climate forecasting for agriculture in sub-Saharan Africa. Experimental Agriculture, 47(2) (2011): 205-240; T. Iizumi, J. Luo, et al., Impacts of El Nino Southern Oscilation on the global yields of major crops, Nature Communications, 5, (2014).

[2093] FAO, The State of World Forests.

[2094] IPCC, Climate Change 2007: Impacts, Adaptation and Vulnerability; Meehl et al. "Global Climate Projections". in Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. (Solomon. S., D. eds.). (Cambridge University Press, Cambridge, United Kingdom and New York, N.Y: 2007).

affect food production given a temperature increases of 2°C or more above pre-industrial times, although some locations may benefit.[2095] However, the report has cautioned that temperature increases of 4°C or more above pre-industrial times, when combined with increasing food demand, would result in higher food security risks globally.[2096]

What this connotes is that increased atmospheric concentrations of CO2 will have an additional fertilization effect that will lead to, for example, an increase in rain-fed wheat yields in Northern Europe which is expected to rise by as much as 30 percent as a result.[2097] Even though an elevated level of CO2 is predicted to have a small benefit in boosting the yield of some crops, however, given the occurrence will take place alongside climate change induced factors, such as changing temperatures, ozone, water, and nutrient constraints, these expected changes may nevertheless thwart increases in yield.[2098] Therefore, when climate change instigated changes in temperature[2099] exceed a crop's optimal level needed for growth, combined with the absence of water and nutrients, the potential yield increases may dwindle or get reversed especially in tropical and sub-tropical regions that are already the most vulnerable and food insecure.[2100] For instance, in sub-Saharan Africa, a sub-region that has faced the highest level of reductions in yield, higher rates of temperature have caused yield declines for maize, sorghum, and groundnuts.[2101] This underlines that the availability of adequate food that entails the possibilities for feeding oneself from land or other natural resources[2102] is constrained as a result of higher temperature.

Moreover, besides the impact on yield, elevated levels of CO2, have caused reductions in protein and nitrogen content in alfalfa and soybean plants resulting in a loss of crop quality in the U.S.[2103] As such, in addition to its impact on yield, higher temperature also threatens to reduce the quality of grains.[2104]

[2095] IPCC, Climate Change 2014: Synthesis Report, 13ff.
[2096] Ibid.
[2097] J. Keane et al., Climate Change and Developing Country Agriculture: An Overview of Expected Impacts, Adaptation and Mitigation Challenges, and Funding Requirements, ICTSDeIPC Platform on Climate Change, Agriculture and Trade, Issue Brief No. 2. (2009).
[2098] G. Takle et al., Agriculture, Climate Change Impacts in the United States: The Third National Climate Assessment, U.S. Global Change Research Program, (J. M. Melillo et al., eds.) (2014):150-174.
[2099] When temperatures rise, the warmer air holds more moisture and can make precipitation more intense. Extreme precipitation events, which are becoming more common, can directly damage crops, resulting in decreased yields. Renee Cho, Agriculture Climate: How Climate Change will Alter Our Food, State of the Planet, (July 15, 2018). available at, blogs.ei.columbia.edu/2018/07/25/climate-change-food-agriculture/, Accessed on 16/11/2018.
[2100] G. Takle et al., Agriculture, Climate Change Impacts in the United States: The Third National Climate Assessment; Parry M. et al, Climate Change, Global Food Supply and Risk of Hunger, Philosophical Transactions of the Royal Society B, 360, (2005): 2125-2138.
[2101] See, A.L. Hoffman et al., Analysis of climate signals in the crop yield record of sub-Saharan Africa, Global Change Biology, 24(1), (2017): 143–157.
[2102] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph: 12.
[2103] G. Takle et al., Agriculture, Climate Change Impacts in the United States: The Third National Climate Assessment; 150-174. A recent study by the U.S. National Climate Assessment, which has examined the effects of climate change on the U.S., has disclosed that given significant actions are not undertaken, climate change will have far-reching consequences on the economy, health and environment, inter alia, the occurrence of wildfires in California, crop failures in the Midwest and crumbling infrastructure in the South. The study furthermore warned that as a consequence of this, American exports and supply chains could be impacted,

Climate change causes a reduction in crop yield because warming rates of temperature, for instance, will affect the rate of plant development by reducing critical periods for crop growth. Even though crop phenology[2105] is more likely to respond in a linear way to changes in temperature[2106], going beyond a certain temperature limit could result in a more abrupt and non-linear shortening of crop developmental stages.[2107] As a consequence, due to the acceleration in crop ripening and the resulting shortening period for crop filling, higher temperature will lead to a reduction in crop yields.[2108] As a case in point, between 2010 and 2012, "high nighttime temperatures affected corn yields across the U.S. Corn Belt, have led to premature budding due to a warm winter that caused $220 million in losses of Michigan cherries in 2012".[2109] Parallel to this, the resulting reduction in grain filling capacity and weakened soil nutrient acquisition, as noted, may additionally exert a direct negative consequence on the nutritional quality of food crops while they may indirectly affect diet quality at a macro scale by reinforcing the production of staple crops.[2110] This is because, instead of pulse crops such as fruits, and vegetables, higher investment is been devoted to the production of cereal grains and oilseeds.[2111]

Moreover in this vein, aside from its direct impact on yields and quality, the state of the climate will also affect decision making by farmers with regards to what crops to grow.[2112] As such, by so doing it may potentially adjust planting decisions in ways that alter micronutrient

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agricultural yields may drop to 1980s levels by midcentury and fire season could spread to the Southeast. See, Coral Davenport and Kendra Pierre-Louis, U.S. Climate Report Warns of Damaged Environment and Shrinking Economy, The New York Times, (November 23/2018), Accessed on 26/11/2018, Available at, https://www.nytimes.com/2018/11/23/climate/us-climate-report.html?fbclid=IwAR1-Wh7C3r4bRrVaF5AHpNOdAVpzmmf5Az_couGRfBgV0JcgEMX-j7wPxHo

[2104] G. Takle et al., Agriculture, Climate Change Impacts in the United States: The Third National Climate Assessment; Colombia University, State of the Planet, (July 15, 2018). available at, blogs.ei.columbia.edu/2018/07/25/climate-change-food-agriculture/. Accessed on 16/11/2018. Researchers found that plants' protein content will likely decrease significantly if carbon dioxide levels reach 540 to 960 parts per million, which are projected to reach by 2100. Studies show that barley, wheat, potatoes and rice have 6 to 15 percent lower concentrations of protein when grown at those levels of CO2. The protein content of corn and sorghum, however, did not decline significantly.

[2105] Phenology is the study of periodic plant and animal life cycle events and how these are influenced by seasonal and interannual variations in climate, as well as habitat factors

[2106] See, P. Gate and N. Brisson, "Advancement of Phenological Stages and Shortening of Phases," In Climate Change, Agriculture and Forests in France: Simulations of the Impacts on the Main Species, (N. Brisson, and F. Levrault eds.) (Angers, France: ADEME 2010): 65-78.

[2107] C. Schär et al., "The Role of Increasing Temperature Variability in European Summer Heatwaves," Nature 427 (2004);332-336.

[2108] P. Craufurd et al. "Climate Change and the Flowering Time of Annual Crops," Journal of Experimental Botany 60 (9), (2009): 2529–2539. Increasing rates of climate variability leads inter alia to an "earlier timing of spring events, including earlier leaf unfolding, bird migration and egg-laying". See also, Rosenzweig, Assessment of observed changes and responses in natural and managed systems, 79-131.

[2109] See, K. J. Boote, et al., "Climate impacts on agriculture: Implications for crop production," Agronomy Journal, 103, (2011): 351-370.

[2110] Much less investment has been targeted at improving production of pulse crops, fruits, and vegetables, all of which provide incredibly important complementary nutrients and phytochemicals to diets. As a result, for the past five decades, cereal grain and oilseed production has far outpaced global production of pulses, fruits, and vegetables.

[2111] FAO, 2013b: FAOSTAT, (FAO, Rome, Italy, 2013).

[2112] M.R. Rosenzweig et al., Wealth, Weather Risk and the Composition and Profitability of Agricultural Investments., Econ J. 103, (1993):56-78.

availability.[2113] For instance, in response to the poor soils and highly variable climates in most of Central and Western Africa, starchy tubers like cassava and yam often dominate cropping systems.[2114] This is with due consideration to their ability to achieve some yield even during worst weather years. This said, however, these crops are very poor sources of both proteins as well as micronutrients.[2115] This reneges on the right to adequate food because the availability of food underlines the "...availability of food in a quantity and quality sufficient to satisfy the dietary needs of individuals...".[2116] Nevertheless, by pressuring farmers to grow crops that have low quantities micronutrient and protein, the dietary needs of farmers that require the diet to contain a mix of nutrients for physical and mental growth, is compromised. Climate change induced higher temperatures and the resulting changes in crop phenology associated may moreover make crops susceptible to increased pest damage during the early stages of crop development.[2117] As a case in point for instance, as a result of warming trends, U.S. and Canada have experienced "...earlier spring activities of insects and to the proliferation of some species, such as the mountain beetle".[2118]

In this regard, the effect of changing rates of temperature will especially have a daunting effect on those tropical and sub-tropical developing countries, where even slight changes in temperature, amounting to 1-2°C, will have a major impact on the level of production both at the local[2119] and global level.[2120] As such, in tropical and sub-tropical geographic location, a rise in temperatures, when combined with decreasing rainfall, water shortages, and drought, threatens to reduce yield as well as livestock health.[2121] This is especially true for sub-Saharan Africa[2122] that is heavily reliant on rain-fed agriculture and has poor water control systems.[2123] In this vein, a recent study[2124] has highlighted that as an upshot of rising rates of temperature,

[2113] Ibid.
[2114] David Lobell & Marshall Burke, Climate Change and Food Security: Adapting Agriculture to a Warmer World, Advances in Global Research 37, (Springer, US: 2010): 27-34.
[2115] Ibid.
[2116] See, The United Nations Committee on Economic, Social and Cultural Rights, General Comment 12 (1999): Paragraphs 8 &9.
[2117] E. Chivian et al., "Climate Change and Extreme Weather Events: Implications for Food Production, Plant Diseases, and Pests," Global Change and Human Health 2 (2), (2001): 90-104.
[2118] L. Crozier and G Dwyer, "Combining population-dynamic and ecophysiological models to predict climate induced insect range shifts," The American Naturalist, 167, (2006): 853-866.
[2119] Climate variability and extremes may not always affect aggregate national food production but can significantly affect sub-national areas with often devastating impacts on food security. A good example will be Ethiopia that has experienced large increases in national cereal production in recent decades albeit regular reports of acute and localized food insecurity and malnutrition crises, often associated with droughts. See, K. Lewis, "Understanding climate as a driver of food insecurity in Ethiopia," Climatic Change, 144(2), (2017): 317–328.
[2120] FAO, The State of World Forests.
[2121] Human Impact Report: Climate Change: The Anatomy of a Silent Crisis, Global Humanitarian Forum, (Geneva, 2009): 23-25; Easterling, "Food, fibre and forest products." Climate Change 2007, 273-313.
[2122] African cereal yields have grown at less than the half of the Asian rate. Notwithstanding an 80% increase in the amount of cropped area on the continent, however, total cereal production has not kept pace with population growth. As a result, the African continent remains to be the only region where per capita production of cereals has declined over the last half century. For more, see, Burke and Lobell, Climate Effects on Food Security: An Overview.
[2123] FAO, The State of World Forests.
[2124] Rebecca Carter et al., World Economic Forum, It's not Enough to Just Limit Global Warming, We Also Need to Adapt, (June 21, 2018) Accessed from, https://www.weforum.org/agenda/2018/06/climate-change-could-force-100-million-people-into-poverty-by-2030-4-ways-we-can-step-up

close to 120 million people worldwide that depend on the production of coffee for their economic survival, will be highly impacted. This is because, a rise in temperature would restrain coffee - which is a heat sensitive plant - to produce fewer beans whereas more pests - such as coffee rust - that are capable of wiping out entire farms, are likely to thrive.[2125]

In this regard, the projected effect of increases in temperature and the resulting constraints are nevertheless expected to affect Africa in general, where even with a slight increase of temperature, is going to impact food production. Consequently, reductions in yields have taken place especially for rice, maize, and wheat, which constitute staple diets in many African diets and the export market.[2126] In this regard, for instance, a 2011 study[2127] conducted in Tanzania, has estimated that by 2050, a projected seasonal temperature increases by 2°C will reduce average yields of maize, sorghum, and rice by 13%, 8.8%, and 7.6%, respectively. Moreover, the study has disclosed that a 20% increase in intraseasonal precipitation variability reduces agricultural yields of maize, sorghum, and rice by 4.2%, 7.2%, and 7.6% respectively.[2128] A similar study that assessed the impact of climate change on crop productivity in South Asia[2129] has revealed that among the staple crops produced in the region, the output for the production of wheat is expected to decline markedly.[2130] The study has stressed that even though the region is highly susceptible overall, the magnitude of this effect, however, will be considerably higher in Pakistan than other countries in the region.[2131]

As a consequence of these constraints in agricultural yield especially felt in vulnerable regions of sub-Saharan Africa and Asia, climate change has directly impinged upon the export sector in these countries. This is because climate change-induced reduction in food production will have a subsequent effect on national GDP, considering the extent of the rise in temperature in these countries, even though it is estimated to range between 1.7% to 10%.[2132] In the light of this, a recent study[2133] conducted has revealed that considering the contribution of agriculture

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adaptation/?fbclid=IwAR1ndeVxibMzUMwHebR0c0Tkmtg7XKddo7XK34-7BhDPnFFBPMknANnxn7I Accessed on 27/11/2018.

[2125] Ibid.

[2126] Maria C. Tirado and Janice Meerman, Climate Change and Food and Nutrition Security, in The Impact of Climate Change and Bioenergy on Nutrition, (Brian Thompson & Marc J. Cohen eds.), (FAO and Springer Heidelberg, London, New York: 2012): 49 ff.

[2127] See, R. Pedram et al., "Climate variability and crop production in Tanzania," Agricult. Forest Meteorol. 151, (2011) 449–60.

[2128] Ibid.

[2129] See, Jayatilleke S. Bandara & Yiyong Cai, "The impact of climate change on food crop productivity, food prices and food security in South Asia," Economic Analysis and Policy 44, (2014): 451-465.

[2130] The countries that were the subject of the study are, Bangladesh, India, Nepal, Pakistan and Sri Lanka, See, Bandara & Cai, "The impact of climate change on food crop productivity, food prices and food security in South Asia, Economic Analysis and Policy," 451-465. This has moreover found out that, given the negative output effect on countries in the region, domestic food prices in all of these countries are projected to rise with the exception of rice in Pakistan and Sri Lanka. This predicted rise is mainly due to the relatively less elastic demand for food. The effect on prices will be more pronounced particularly in Bangladesh, India and Nepal.

[2131] Ibid.

[2132] R. Clements, The economic cost of climate change in Africa, (Practical Action Consulting Warwickshire: 2009); Tirado and Meerman, Climate Change and Food and Nutrition Security, 49ff.

[2133] According to the study, the magnitude of the impact on GDP will be different in the region in that in countries such as Nepal and Bangladesh has a higher impact than other countries in the region due mainly to the

to the national GDP in the region, which is at 18%, the impact of climate change has more serious implications in South Asia relative to the rest of the world. Therefore, the study has disclosed that the projected impact of climate change in terms of the expected wane in agricultural productivity affects real GDP markedly in the region.[2134]

Consequently, at the national level, reduction in yield is going to induce the dependency of developing countries on food imports. On the contrary, however, temperate zone food exports destined from tropical zone countries are going to see a rise.[2135] Building on this, similar studies have shown[2136] that even considering the above discussed carbon fertilization effects of CO2, under which an increased concentration of CO2 in the atmosphere acts as a stimulus for the productivity of crops[2137], economies which are dependent on agriculture will face an estimated loss of more than 50 percent of their total agricultural output by 2080.[2138]

The above-presented effects that ensue from climate-induced increases in temperature will especially renege on small-scale farmers[2139] living in developing countries. The upshot of this will restrain their ability to ensure the provision of adequate food for themselves as well as to the market. This is because small-scale farmers face the brunt of the effect in that they will be hit twice by unfavorable climatic conditions. This is because, firstly, the impact of such climate turbulences on the right to food is witnessed when small-scale farmers[2140] are unable to get enough yield from their harvest.[2141] This restricts local food producers from food provision to their families. The realization of the right to adequate food is restricted, in this regard, because these farmers will not have enough yield so as to ensure adequate food provision[2142] for "...feeding oneself directly from productive land or other natural

larger role that agriculture plays in these small countries. See, Bandara & Cai, The impact of climate change on food crop productivity, food prices and food security in South Asia, 451-465.

[2134] Ibid.

[2135] Easterling et al., "Food, fibre and forest products." Climate Change 2007," 273-313.

[2136] International Center for Trade and Sustainable Development (ICTSD), Climate Change, Agriculture and Aid for Trade, (ICTSD-IPC Platform on Climate Change, Agriculture and Trade: 2009).

[2137] In mid to high latitude regions, moderate and medium local increases in temperature (1 to 3°C) 12, along with associated carbon dioxide increases and rainfall changes, can have certain beneficial impacts on crop yields.

[2138] Widely cited estimates show that over the period 1980 to 2008, there is clear evidence for the 5.5 percent decline in the yields of wheat and a 3.8 percent drop in maize yields globally. See, FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security, (FAO, Rome 2016): 22; D.B. Lobell et al., "Climate trends and global crop production since 1980," Science 333 (2011): 616-620.

[2139] In 2010, some 900 million of the estimated 1.2 billion extremely poor lived in rural areas. About 750 million of them worked in agriculture, usually as smallholder family farmers. See, P. Olinto et al., The State of the Poor: Where are the poor, Where is Extreme Poverty Harder to End, and What is the Current Profile of the World's Poor?, Economic Premise No. 125, (World Bank, Washington DC.: 2013).

[2140] Half of the world's hungry people are constituted by smallholder farmers who live off a limited area of land and are for the most part without adequate access to productive resources. Moreover, close to two thirds of these people live on marginal lands in environmentally difficult conditions. See, Bals et al., Climate Change, Food Security and the Right to Adequate Food, 52-55.

[2141] Human Impact Report: Climate Change: The Anatomy of a Silent Crisis, Global Humanitarian Forum, (Geneva, 2009): 23-25.

[2142] Likewise, weather variability impacts the provision of wild food varieties (landraces) by different ecosystems. Especially vulnerable in this regard will be local communities that rely on such wild varieties for food and medicine as examined under chapter four of this research. In this regard, a study conducted in sub-Saharan Africa, has revealed that from 5000 plant species that were studied, as a result of climate change, 81 - 97 percent of the suitable habitats are expected to decrease in size or to shift their habitat. For more, see, K. Levin, & J. Pershing, Climate science: Major New Discoveries, WRI Issue Brief, (WRI, Washington, DC.: 2005).

resources".[2143] Secondly, due to a shortage of food production, these farmers will be required to purchase food.[2144] Nonetheless, this will happen, as noted, at a time when food prices have gone up due to a global shortage in crop yield and population number has grown.[2145] Accordingly, when prices are high or change rapidly, the poor suffer the most since they spend most of their income on food and have no safety-nets against rising prices.[2146] Nevertheless, the effect will also be felt by the urban poor who buy all of their food from the market. As such, a climate-induced rise in temperature reneges on the right to adequate food by firstly causing reductions in yield, nutritional value, export capacity and as a consequence, the GDP, of the regions that are the most vulnerable.

9.1.2. Extreme Weather Events Encroach on Food Availability

As already noted, climate change affects the availability of food as a result of climate variability and fluctuations. Given the occurrence of such climate variability becomes widespread, the likelihood for the incidence of drought and floods will be heightened. This is because, as noted, such extreme weather events serve as major causes of short-term fluctuations in food production especially in sub-arid and sub-humid locations to be found in sub-Saharan Africa and Southern Asia.[2147] This implies that the adverse effects on the level of food production will be more pronounced in these regions that are already the most food insecure.[2148] The IPCC, in its fifth assessment report,[2149] has also confirmed, in this regard, that the adverse effects of climate change on crop yields are going to impinge on those countries that are already the most food insecure. For example, extreme weather events, specifically in relation to the occurrence of floods and drought, threaten crops as a result

[2143] U.N. Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999).: Paragraph 12.
[2144] Human Impact Report: Climate Change: The Anatomy of a Silent Crisis, Global Humanitarian Forum, (Geneva, 2009): 23-25.
[2145] Ibid.
[2146] This is because reduced income in the agricultural sector is behind the largest share of increased poverty as a result of climate change. This is because the most severe reductions in food production and increases in food prices occur in Africa and India, which account for a large share of the world's poor. The second most important factor leading to increased poverty is health impacts, followed by the impacts of higher temperatures on labour productivity. See, S. Hallegatte, et al., Shock Waves: Managing the Impacts of Climate Change on Poverty, Climate Change and Development Series, (Washington, DC, World Bank 2015).
[2147] Josef Schmidhuber and Francesco N. Tubiello, "Global Food Security Under Climate Change", Article in Proceedings of the National Academy of Sciences, (Food and Agriculture Organization, Center for Climate Systems Research, Columbia University: New York and Land Use Change Program, International Institute for Applied Systems Analysis: Laxenburg, Austria)
[2148] Ibid.
[2149] The studies moreover show that, "in the medium term, that is, until about 2030, the positive and negative effects on yields could offset each other at the global level, the balance after this date would be increasingly negative as climate change accelerates. The data also show that projected impacts of climate change on yields of maize, wheat and rice in the second half of the 21st century are more often negative for tropical regions than for temperate regions. For more, see, J.R. Porter et al., Food security and food production systems, in Climate Change 2014: Impacts, adaptation, and Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (C.B. Field, V.R. Barros, et al., eds.) (Cambridge University Press, Cambridge, UK and New York, NY, USA: 2014): 485–533; A.J. Challinor et al., A meta-analysis of crop yield under climate change and adaptation, Nature Climate Change, 4 (2014): 287-291.

leading to a reduction in yield.[2150] Especially in communities that depend on rain-fed agriculture, the reoccurrence of drought has been blamed for causing the loss of productive assets as well as the sustainability of the livelihood systems in such communities.[2151] This is because desertification snatches away the amount of arable land which is needed for agriculture.[2152] In this vein, such incidences will threaten to reduce the quality of the soil further reneging on food availability.[2153] Especially exposed, in this regard, will be areas where rising summer temperatures cause soils to become drier.[2154] Even if, as a response mechanism enhancing irrigation, in some places, might be viable, in locations/areas where water availability may be reduced, such as countries in sub-Saharan Africa, they will not be able to make use of irrigation due to shortages in water.[2155] In this regard, when combined with unsustainable production and irrigation practices, climate change will lead to increased salinization of soil, along with nutrient depletion and erosion.[2156]

As a consequence of this decline in agricultural productivity, in those regions that are highly exposed to climate change, as examined under chapter three of the research, the pattern of agricultural trade will be affected. This is notwithstanding the fact that international trade in agriculture is expected to remedy local food shortages that have resulted from the loss of crops as a consequence of, for instance, drought.[2157] The underlying reason for this is that even though agricultural production in temperate zones regions of North America, and Europe, is expected to increase[2158] due to higher mean temperatures and longer growing seasons, agricultural productivity in the other regions, where most of the developing countries are, is expected to decline.[2159] Hence, for those developing countries where agricultural exports constitute a large proportion of the total agricultural output[2160], food security at the national level is to be fulfilled through dependency on food imports, which is projected to also grow for most developing countries.[2161] As a result of this, temperate zone regions will export more food commodities to tropical regions, whereas non-temperate-zone regions will be

[2150] G. Takle, et al., Agriculture, Climate Change Impacts in the United States: The Third National Climate Assessment, 150-174.
[2151] See, W.F. Laurence & G.B., Williamson, Positive Feedbacks Among Forest Fragmentation, Drought and Climate Change in the Amazon, Conservation Biology, 28(6): (2001): 1529-1535.
[2152] L. Erda et al., "Climate change and food security in China," The Chinese Academy of Agricultural Science and Greenpeace China; Fischer, G., et al.: "Socio-economic and climate change impacts on agriculture: an integrated assessment, 1990-2080." Philosophical Transactions of the Royal Society, (2005).
[2153] Ibid; Easterling et al., "Food, fibre and forest products," Climate Change 2007, 273-313.
[2154] G. Takle, et al., Agriculture, Climate Change Impacts in the United States: The Third National Climate Assessment, 150-174.
[2155] Ibid.
[2156] Globally, some 20% of irrigated km2 of land (450,000 is salt-affected, with 2,500–5,000 of lost production every year as a result of salinity. UNEP 2009 Annual Report, (Nairobi, Kenya, February 2010) .
[2157] See, FAO, Climate Change and Food Security: A Framework Document, (FAO, Rome, 2008): 25ff.
[2158] In this context, agricultural production and trade in temperate regions is especially going to increase for cereal crops, livestock and forestry, while the reverse may by true with regard to forestry in the short-term. See, Easterling et al., "Food, fibre and forest products." Climate Change 2007, 273-313.
[2159] See, Hoffmann, Assuring Food Security in Developing Countries under the Challenges of Climate Change.
[2160] Easterling et al., "Food, fibre and forest products." Climate Change 2007, 273-313
[2161] Ibid; Thompson & Cohen, The Impact of Climate Change and Bioenergy on Nutrition.

required to import so as to fulfill their food demands.[2162] Therefore, akin to the constraints posed by reductions in yield, extreme events additionally renege on the right to food.

9.2. Limitations on the Accessibility of Adequate Food

Building on the above analysis into how climate change restrains the availability of food, the section below examines how climate change impinges on the accessibility of adequate food to the public. [2163]

Before advancing to analyzing the issue at hand, it is pertinent to note that, an assessment of the effects of climate change on the accessibility of adequate food depends on a number of inter-related factors such as income, how much households spend on food purchases and is a net-consumer of food and how well integrated the local market is, into the global market.[2164] By taking this into consideration, the section will specifically divulge on the constraints on farmers' incomes and food prices.

9.2.1. Farmers Incomes Get Slashed

The discussion below will explore how the economic accessibility of adequate food is hampered as a result of climate change, notably extreme weather events and climate variability.

Putting the above-discussed indicators into context, at the outset, the effect of climate change, mainly in relation to extreme events and climate variability, will be felt more on households that mainly rely on agriculture as the main source of income.[2165] In this vein, according to studies conducted[2166], mostly rural populations are expected to experience a high level of dependency on agriculture as the main means of livelihood. In the light of this, the level of

[2162] See, Hoffmann, Assuring Food Security in Developing Countries under the Challenges of Climate Change. In these non-temperate regions, total net cereal import volume of developing countries, for instance, could increase by some 45–50 per cent in 2050 relative to the year 2000.

[2163] According to the Committee on Economic, Social and Cultural Rights (CESCR), accessibility to adequate food incorporates both economic and physical accessibility. While Economic accessibility implies that personal or household financial costs associated with the acquisition of food for an adequate diet should be at a level such that the attainment and satisfaction of other basic needs are not threatened or compromised, Physical accessibility implies that adequate food must be accessible to everyone. See, UN Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999).

[2164] See, Brown, Food Security, Food Prices and Climate Variability, 5ff.

[2165] The majority of people most vulnerable to climate shocks and natural hazards are the world's 2.5 billion small-scale farmers, herders, fishers and forest-dependent communities, who derive their food and income from renewable natural resources. See, FAO, The State of Food and Agriculture 2016: climate change, agriculture and food security, (FAO, Rome, Italy 2016); Lobell & Burke, Climate Change and Food Security Adapting Agriculture to a Warmer World, Advances in Global Research, 27-32.

[2166] B. Davis et al., "Rural income generating activities: A Cross Country Comparison," ESA Working Paper, (FAO Rome, 2007); Lobell & Burke, Climate Change and Food Security Adapting Agriculture to a Warmer World, Advances in Global Research, 27-32.

dependency is bound to rise especially for the poorest households that rely on two-thirds of the income which is earned from the provision in the market of crops, cattle, as well as the value of these goods for domestic consumption.[2167] This connotes, as such, that due to the high dependence of poor households, like small-scale farmers[2168], living in developing countries on agriculture, they are highly likely to experience the negative effect of a lowering of income as a consequence.[2169] As such, as a corollary of lower incomes earned by poor farmers, the economic accessibility of adequate food will be impaired.[2170] This is because these farmers will be restrained in their efforts to afford the provision of food supply for themselves/ their families.[2171] For instance, in this vein, variability in temperature and rainfall in Ethiopia and Niger has been linked with reductions in household income and consumption costs.[2172] Moreover, due to reductions in yield and food availability, as explored in the above sub-section, farmers will not be in a position to afford the purchase of food from the market.[2173]

In addition to this, climate change exacerbates an existing problem present in these farming communities when it comes to incomes earned. This is so because most of the income earned by farmers in developing countries is made up of assets and entitlements that cannot be monetized.[2174] For instance, incomes earned by households may include, "...loans and gifts of food from relatives and friends, productive resources such as land, farm implements and seed stock, livestock, and natural resources in the public domain".[2175] As such, these farming households that have experienced yield declines due to climate change, for instance, would be required to convert their assets into cash so as to be able to purchase needed food commodities from the market.[2176]

Notwithstanding this possibility, however, in the likely circumstance that many farmers in affected regions will also require cash because their crops have failed as a consequence of climate change, the value of assets that can possibly be sold so as to purchase food will be

[2167] Ibid.
[2168] As a case in point for instance, Small-scale farmers produce respectively 63 and 69 percent of the food in Kenya and the Tanzania. See, G. Rapsomanikis, the economic lives of smallholder farmers: An analysis based on household data on nine countries, (FAO Rome, Italy, 2015).
[2169] Lobell & Burke, Climate Change and Food Security Adapting Agriculture to a Warmer World, Advances in Global Research, 27-32.
[2170] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12(1999): Paragraph 13.
[2171] Ibid. The provision reads, "Availability refers to the possibilities either for feeding oneself directly from productive land or other natural resources, or for well-functioning distribution, processing and market systems that can move food from the site of production to where it is needed in accordance with demand."
[2172] For more, see, S. Asfaw and G. Maggio, Gender, Weather Shocks and Welfare: Evidence from Malawi, Journal of Development Studies 54(2), (2018): 271–291; M. Wondaferash, et al., Prevalence of Undernutrition and Associated Factors Among Children Aged Between Six to Fifty-Nine Months in Bule Hora district, South Ethiopia, BMC Public Health, 15(41), (2015).
[2173] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.
[2174] Brown, Food Security, Food Prices and Climate Variability, 5ff.
[2175] Ibid.
[2176] Ibid.

negatively affected as a result of lack of demand.[2177] This connotes that these poor farmers that have experienced a lowering of income due to yield shortages, will be restricted in their attempt to ensure food provision from the market by selling their assets due to lack of demand. This will additionally constrain the economic accessibility of adequate food because economic accessibility underlines that personal and household financial costs associated with food acquisition, "... should be at a level such that the attainment and satisfaction of other basic needs are not threatened or compromised".[2178] As such, as a consequence of climate-induced changes leading to a reduction in yield, the accessibility of adequate food will be restrained because firstly, incomes earned by poor farmers - small-scale farmers will diminish. Secondly, these farming households will be hit again as they are unable to sell their assets on the market, which will incapacitate them from earning needed cash by selling their assets, so as to ensure food acquisition from the market.

[2177] See, A. K Sen, Poverty and Famines: An essay on Entitlements and Deprivation, (Oxford, UK, Clarendon Press, 1981).
[2178] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.

9.2.2. Extremes Heighten Food Prices

Akin to the afore analysis on climate-induced factors that constrain food availability to the public, the negative effects of climate change on access to adequate food can also be seen most vividly through the occurrence of frequent and more intense extreme weather events, *inter alia*, floods and drought.[2179] In this regard, notwithstanding the fact that prices are affected by various factors, there is evidence to suggest that higher average temperature has been at the core of higher maize prices, for instance, in countries such as Bangladesh, Benin, Eritrea and Ethiopia.[2180] This is because as an upshot of such incidents, food prices could increase due to the ensuing scarcities of water, land, and fuel[2181] and the introduction of payments for environmental services to mitigate climate change.[2182]

Moreover, as disclosed in the previous chapter of this research, the international market for agricultural commodities is highly volatile owing to the fluctuation of food prices, most notably, in the oilseed and cereals sectors.[2183] This is because climate change induced adverse weather conditions and extreme events are considered to be the primary factors behind the volatility in agricultural markets.[2184] As a result, this has caused food prices to be volatile in the international market as such restraining the stability and affordability of food supply.[2185] As already noted, such unpredictability in the international market for food exerts a negative effect on food availability especially on those food importing regions that will not be in a position to afford their food import bills.[2186] In this regard, the FAO explicitly mentions "weather-related production shortfalls "...as one of the factors that have contributed to the recent increase in food prices".[2187] Thus, as a corollary of extreme weather events and ensuing speculation in the international markets, prices are expected to become more volatile in the coming period, akin to that experienced during 2007-2008.[2188]

This said, how has the occurrence of extreme weather events impinged on the accessibility of adequate food to the public? The incidence of climate change induced extreme weather events

[2179] Changes in mean temperature and rainfall will have less direct effect affecting primarily land suitability for different types of crops and pasture, the incidence of and vectors of different types of pests and diseases and biodiversity of natural habitats. Bals et al., Climate Change, Food Security and the Right to Adequate Food, 52-55.
[2180] See, FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition.
[2181] The 'green revolution' of the 1960s and 1970s addressed food shortages, not only through improved plant breeding, but also by tripling the application of inorganic fertilizers, expanding the land area under irrigation and increasing the use of fossil fuels for farm mechanization, food processing and transport. FAO, The State of the World's Land and Water Resources for Food and Agriculture Managing Systems at Risk, (FAO, Rome, Italy & Earthscan, 2011).
[2182] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 52-55.
[2183] See, FAO, Climate Change and Food Security: A Framework Document, 25ff
[2184] OECD/FAO, OECD-FAO Agricultural Outlook 2011-2020.
[2185] Nellemann et al., The environmental food crisis: The environment's Role in Averting Future Food Crises. A UNEP Rapid Response Assessment, 83-85.
[2186] See, FAO, Climate Change and Food Security: A Framework Document, 25ff
[2187] The State of Food and Agriculture: Biofuels, Prospects, Risks and Opportunities, (FAO, Rome, Italy, 2008a).
[2188] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 56.

impinge on food accessibility firstly due to rising food prices.[2189] As noted, climate-induced shortfalls in production as a result of changing climatic conditions at the national level, especially in the major global producers, can trigger an increase especially in the price of food, as well as animal feed globally.[2190] This will exert a negative influence on the affordability of adequate food to the public - especially on poor households that devote a large part of their income for purchasing food - further reckoning their economic status to access adequate food.[2191]

Moreover, due to high levels of uncertainty that characterize the commodity market, high fluctuations in price would induce poor investment strategies, productivity as well as income of farmers.[2192] This is because, as a result of the adverse effects of climate change, farmers will be forced to change and modify their production practices. As a consequence of the decreased investment made by farmers, they will be incapable to meet changing consumer demands.[2193] This may negatively influence their income generating capacity because of which they will be unable to afford to buy adequate food.[2194] Furthermore, as a consequence of annual variability of weather conditions, these households, who are no longer able to earn enough income, will be forced to diversify their options by seeking employment in other non-farm sectors.[2195] Therefore, by snatching away the independence of farmers in determining their investment strategies, the consequence of this will impinge on the economic accessibility of adequate food that gives due regard to any acquisition pattern through which people procure their food.[2196]

According to the CESCR[2197], accessibility of adequate food to the public is determined both by its economic as well as physical accessibility. Due to its impact on the main income earning sector in developing countries, agriculture which constitutes a major share of national GDP as well as employment directly impinges upon economic accessibility of small-scale

[2189] Cline, Global warming and agriculture: Impact estimates by country; Braun J. Von, The World Food Situation: New Driving Forces and Required Actions, Food policy Report, (Washington, DC, 2007a). Available at, IFPRI. http://www.ifpri.org/pubs/fpr/pr18.pdf

[2190] The State of Food and Agriculture: Climate Change, Agriculture and Food Security, 22ff; FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition.

[2191] The State of Food and Agriculture: Climate Change, Agriculture and Food Security, 22ff; General Comment 12 (1999): Paragraph 13; Nellemann et al., The environmental food crisis: The environment's Role in Averting Future Food Crises. A UNEP Rapid Response Assessment, 83-85. It is important to note in this regard that climate change is only one of the variables affecting food price volatility, even though it appears to be a salient one. Rising food prices will also significantly affect consumers and the urban poor, especially in developing countries as they devote large sums of their income (75%) on food.

[2192] The State of Food and Agriculture: Climate Change, Agriculture and Food Security.

[2193] Nellemann et al., The environmental food crisis: The environment's Role in Averting Future Food Crises. A UNEP Rapid Response Assessment, 83-85.

[2194] Climate Change and Food Security: A Framework Document, 23-24.

[2195] Lobell & Burke, Climate Change and Food Security Adapting Agriculture to a Warmer World, 27-32.

[2196] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 13.

[2197] Ibid, Paragraph 12 and 13. According to the Committee on ESCR, "Economic accessibility implies that personal or household financial costs associated with the acquisition of food for an adequate diet should be at a level such that the attainment and satisfaction of other basic needs are not threatened or compromised. Physical accessibility implies that adequate food must be accessible to everyone, including physically vulnerable".

farmers to afford adequate food.[2198] This connotes that such households that depend on agricultural production for themselves as well as for local food provision, as indicated above, are impacted severely as they will not be in a position to afford food. Thus, because of its large contribution to the incomes of farming households, climate variability in tandem with extreme weather events may scale down on what is produced annually.[2199]

As a case in point, for example, a study[2200] conducted in sub-Saharan Africa has indicated that as a result of the occurrence of extreme weather events[2201], between 2006-2010, the price of food has increased and especially between 2010-2011, it has risen almost by 50%. This study has further confirmed that sub-Saharan African countries are especially affected by price volatility because they are net-food importers and highly vulnerable to climate change.[2202] This means that the effect will be more pronounced on small-scale farmers whose incomes depend on the provision of their crops as well as animals in the local market.[2203] Consequently, as opposed to commercial farmers who are usually protected by insurance, small-scale farmers will face the brunt of the burden as a result of a sharp reduction in their incomes.[2204] The effect will be exacerbated on farmers due to the fact that government support to farmers in developing countries is negligible - when compared with that offered in developed countries - which incapacitates these farmers from having the financial capability to provide food for their family.[2205]

In line with this, the occurrence of extreme weather events may restrain the availability of certain food products, as noted, as a result influencing their price.[2206] As a consequence of hikes in the price of food, certain crops will become unaffordable negatively restraining the economic accessibility of food. This said, however, higher crop prices will mainly affect, as indicated above, low-income households because they tend to devote a large amount of their income on food when compared with high-income households.[2207] Therefore, climate change induced incidents also impinge on food accessibility by influencing how much a household's earnings are spent on buying food.[2208] In this regard as well, unlike wealthy countries that do not spend all of their earnings on food purchases, poor households in developing countries

[2198] FAO, Climate Change and Food Security: A Framework Document, 23-24.
[2199] Ibid.
[2200] Christine et al., Implications of Climate Change on Crop Yield and Food Accessibility in Sub Saharan Africa.
[2201] According to a recent study undertaken by FAO, climate variability and extreme weather evens have increased in intensity and occurrence throughout the world. As such, the result of the study have disclosed that these incidents are behind the recent rise in global hunger and the leading causes of severe food crisis. The study has moreover indicated that the effect of such incidents is more pronounced on regions and countries that are already the most vulnerable to climate change and food security. See, FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building climate resilience for food security and nutrition.
[2202] Christine et al. Implications of Climate Change on Crop Yield and Food Accessibility in Sub Saharan Africa.
[2203] FAO, Climate Change and Food Security: A Framework Document, 23-24.
[2204] Ibid.
[2205] Islam and Wong, Climate Change and Food In/Security: A Critical Nexus Division of Sociology.
[2206] FAO, Climate Change and Food Security: A Framework Document, 23-24.
[2207] A. Thomsen & M. Metz, Implications of economic policy for food security: A training manual, (FAO, Rome: 1998); the German Agency for Technical Cooperation (GTZ), Climate Change and Food Security: A Framework Document, (FAO, Rome 2008): 23-24.
[2208] Lobell & Burke, Climate Change and Food Security: Adapting Agriculture to a Warmer World, 27-32.

devote close to half of their income on food as such implying that they will be highly susceptible in the face of food price changes.[2209]

As a case in point, as an adverse byproduct of climate change, extreme weather events such as floods and drought will pose a direct effect on the stable accessibility of adequate food to the public. In this respect, according to a latest study by FAO[2210], the occurrence of climate-related extreme weather events, floods, droughts, and tropical storms, has increased such that they constitute 80% of all internationally reported disasters. The IPCC[2211] has likewise concluded, "with high confidence", that the frequency and severity of extreme weather events will exert a direct influence on food security and forestry production. This is mainly due to the fact that unpredictable weather events threaten the livelihood of small-scale farmers living in vulnerable regions. As a consequence, such unexpected changes, negatively affect the purchasing power of smallholders whose main way of life is dependent on agriculture.[2212] Moreover, in this vein, the expected decline in food availability as a result of the above-discussed reductions in crop yield, alongside lower forest productivity, changes in aquatic populations, and the high costs demanded for adaptation, together encroach on the financial capability of small-scale farmers to access adequate food.[2213]

Another factor worth looking into with regard to access to food has to do with the degree to which a given household is a net consumer or producer. This implies that when food prices change as a result of climate change, those households that are net consumers of food will directly be impacted.[2214] As such, besides how much a household earns from selling their produce, the net-consumption position in the household will also determine food accessibility. As such, urban consumers that are mostly net-consumers of food will be negatively impacted when food prices go up.[2215] A similar trend is observable even in those poor households that have experienced, for example, bad harvest. Poor households will become net-food consumers by resorting to the purchase of their food demands from the market, even by making use of their non-farm income.[2216] This restrains the accessibility to adequate food of poor households by snatching away the possibilities for feeding themselves directly from productive land or natural resources.

[2209] Ibid.
[2210] For more, see, Centre for Research on the Epidemiology of Disasters (CRED), The Human Cost of Natural Disaster: A Global Perspective, (Brussels, 2015); FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition.
[2211] Easterling et al., Food, fibre and forest products. In Climate Change 2007, 273-313.
[2212] Ibid.
[2213] FAO, Expert meeting on climate-related transboundary pests and diseases including relevant aquatic species: options for decision makers (FAO, Rome, 2008c).
[2214] Lobell & Burke, Climate Change and Food Security: Adapting Agriculture to a Warmer World, 27-32.
[2215] Ibid.
[2216] Ibid.

9.2.3. Price Surges Prompt Import Dependency

According to a study by the IPCC[2217], a temperature increase of more than 3°C could increase prices by up to 40%. This rise in the price of agricultural commodities is expected to benefit net-food producers (countries that export more crop than they import for example). This said, however, net-food consumers, developing countries, are not going to receive these benefits, because as noted, they are for the most part highly vulnerable to the effects of climate change.[2218] Specifically, in this regard, most African countries are net food importers, as discussed in more detail under chapter three of this research, with over 50% of North Africa's food requirement and between 25% and 50% in sub-Saharan Africa having been imported.[2219] In this regard, for example, the import bill of sub-Saharan Africa for cereal was estimated to be about 9.8 billion in 2008 showing a 35% increase from its level in 2007.[2220] It can be stressed here that notwithstanding the fact that trade has an important role to play with regard to the provision of adjustments to climate change-induced shifts in production[2221], according to a recent study, climate change could cause a marked reduction - 12% - in the food self-sufficiency of developing countries by 2050.[2222] This highlights that, at the national level, economic accessibility to afford adequate food is restrained by changes in climate, because the aforenoted vulnerable regions will be incapable to ensure food self-sufficiency.

Parallel to this, access to food is also determined by whether a local market is well integrated into the global market such that local prices track global or regional price movements or local prices only reflect the local shifts in production.[2223] In this vein, the more integrated a local market is with the global market, even after enduring huge productivity loses - yield reductions - as a result of climate change, such regions will be less affected to changes in food prices given they are able to import the food they have lost. Contrary to this, however, developing country regions that are well integrated into the global market, could nevertheless feel a rise in food prices even if they are less affected by local changes in climate.[2224] Notwithstanding this possibility to make up for yield losses through trade, as disclosed further under chapter three of the research, local markets in these developing countries are not well integrated into the global market.[2225] This implies that the above-discussed vulnerable regions such as sub-Saharan Africa that has incurred productivity losses as a result of climate change,

[2217] Easterling et al., Food, fibre and forest products, 273–314.
[2218] FAO, Report of the twenty-fourth FAO regional conference for Africa, (FAO, Bamako 2006b).
[2219] Ibid.
[2220] A. B. Kamara, et al., Soaring food prices and Africa's vulnerability and responses: An update, Working Papers Series No. 97, (Tunis: African Development Bank, 2009).
[2221] G.C Nelson et al., Food security, Farming, and Climate Change to 2050: Scenarios, Results, Policy Options. (Washington, DC, IFPRI 2010); V. Chomo & C. De Young, Towards Sustainable Fish Food and Trade in the Face of Climate Change., BIORES, 9(2) (2015).
[2222] E. Valenzuela & K. Anderson, Climate change and food security to 2050: A Global Economy-wide Perspective, Paper Presented at the 55th Annual Conference of the Australian Agricultural and Resource Economics Society, (9–11 February 2011).
[2223] Lobell & Burke, Climate Change and Food Security Adapting Agriculture to a Warmer World, 27-32.
[2224] Ibid.
[2225] See, Chapter Two of this research.

will experience price increases due to the fact that these markets are not well integrated into the global economy.[2226]

As can be grasped from the above discussion, climate change, especially in relation to increases in the occurrence of extreme weather events, temperature, and climate variability affect both the availability and accessibility of adequate food to the public even though the different regions of the world may experience the ramifications differently.

[2226] Lobell & Burke, Climate Change and Food Security Adapting Agriculture to a Warmer World, 27-32.

10. Response Mechanisms to Tackle Climate Change

The Framework Agreement, with due consideration to adverse effects of climate change, such as the above-explored factors in relation to the right to adequate food, gives a wide space for response mechanisms that are meant to address the effects of climate change. In this respect, it gives a special resonance to mitigation and adaptation measures which the State Parties should take into consideration in order to meet the objectives therein.[2227] As an important mitigation strategy, for instance, the agreement draws to attention the need to reduce GHG emission and the enhancement of "sinks".[2228] Moreover, it brings to attention the need to adapt to the negative effects of climate change by strengthening adaptation capability.[2229] As can be recalled from the above discussions, it is evident that building upon the UNFCCC, the Kyoto Protocol has introduced, for the first time, mandatory GHG emission reduction targets of five percent - when compared to the level it was at in 1990 - to be met between 2008-2012 (first commitment period).[2230] The continuation in the occurrence of climate instability/ variability which is being experienced worldwide has revealed that no mitigation effort along will be able to stop climate change. As such, at a time when the adverse effects of climate change are unfolding frequently with far-reaching implications, effective adaptation strategies are also of vital importance. Once again, relying solely on adaptation measures would not be able to address climate change in its entirety without due regard to the importance of mitigating efforts. For this reason, adaptation, as well as mitigation measures, are necessary if climate change is to be addressed effectively.[2231] In the light of this, the Bali roadmap[2232] has been adopted, which has ascertained that in the coming decades, actions that are aimed at safeguarding food security and ensuring rural livelihoods under climate change should give due respect to the synergies between both adaptation and mitigation strategies in the agricultural and forestry sectors.[2233] The discussion below will examine in detail these response mechanisms drawing on some policy options available for States to take into consideration.

[2227] See, United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(1) (b).

[2228] Ibid, Article 1(8). According to UNFCCC," Sink" refers to "any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere".

[2229] Ibid, Article 4(1) (b), 4(1)(e), 4(1)(f), 4(4), 4(8) and 4(9).

[2230] See, Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Annex 2.

[2231] See also, Burton, I. and M. van Aalst, look before You Leap: A Risk Management Approach for Incorporating Climate Change Adaptation in World Bank Operations, (World Bank, Washington, DC, USA: 2004). In spite of the fact that the Framework Agreement refers to both mitigation and adaptation, until recently national and international climate policy focused mainly on mitigation. On the one hand this reflected the concern of some that a stronger focus on adaptation would weaken society's willingness to mitigate climate change. On the other hand, it signified the belief of others that the "invisible hand" of natural selection and market forces would bring about adaptation without the need for policy intervention.

[2232] The Bali Roadmap presents the strategies for climate change adaptation and mitigation under the UNFCCC and the financial mechanisms that have been established within it as a unique opportunity for developing countries.

[2233] FAO, Climate Change: Challenges and Opportunities in the Food Sector.

10.1. Mitigation

Notwithstanding the fact that industrial agriculture is a large emitter of GHGs - amounting to around 32% of emission in the atmosphere as already discussed afore - the agricultural sector also has large mitigation and adaptation potential.[2234] A good example, in this regard, is sustainable small-scale agriculture which has a large contribution to both climate change mitigation and adaptation options while it does so whilst conserving agrobiodiversity and ensuring food security.[2235]

Before proceeding to a detailed discussion, this sub-section starts off from an assessment of what is meant by mitigation measures and constituting factors. Accordingly, mitigation measures refer to actions taken by States in order to lessen and lower the rate at which climate change is occurring. The IPCC defines mitigation measures as an "anthropogenic intervention to reduce the anthropogenic forcing of the climate system; it **includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks**" (emphasis added).[2236] The main aim of mitigation measures is therefore to reduce the level of emission or to increase "sinks" (sequestration[2237]).[2238] For the IPCC, mitigation institutes "technological change and substitution that reduce resource inputs and emissions per unit of output".[2239] This is because such measures have the potential to delay and to reverse, in the long-run, the rise of temperature.[2240]

Therefore, mitigation measures are vital because they aim to guard against temperature rise which is above the threshold level of 2 degree Celsius above pre-industrial times after which point climate change will be irreversible. The mitigation potential of agriculture is enormous. In this regard, for instance, sustainable agricultural practices can sequester close to 40% of

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[2234] IPCC, Climate Change: Mitigation, Contribution of Working of Group III Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (2007): 499-515. FAO, "Climate Change: Korovian Join Work on Agriculture", Available at http://www.fao.org/climate-change/our-work/what-we-do/koronivia/koroniviafaqs/en/, Accessed on 07/01/2020.; FAO. 2018. "Koronivia Joint Work on Agriculture: Analysis of Submissions". *Environment and Natural Resources Management Series*, Working Paper 71, (Rome, Italy: 2018). In relation to this, at the 23rd Conference of the Parties (COP) in November 2017, theKoronovian Joint Work on Agriculture (KJWA) was adopted (Decision 4/CP.23) to the UNFCCC. The decision has made the agreement the first such substantive decision made by the COP on agriculture. The decision specifically recognizes the role of agriculture in tackling climate change by requests the two Subsidiary Bodies under the Convention, namely the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI), to jointly address issues related to agriculture,while taking into account the vulnerabilities of agriculture to climate change and approaches to addressing food security. In this regard, the KJWA represents a pertinent step forward in the negotiations on agriculture with the UNFCCC as it recognizes the importance of agriculture and food security in the climate change agenda.

[2235] See, Working Group On Climate Change and Development, Other Worlds are Possible: Human Progress in An Age of Climate Change, (November 2009): 40-42; FAO, Climate change and food security: A Framework Document. Summary.

[2236] Climate Change 2007: Mitigation of Climate Change Contribution of Working Group III to the Fourth Assessment Report.

[2237] UNFCC, Article 1(8). According to UNFCC, "Sink" refers to "any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere".

[2238] Bockel, & Smit, "Climate Change and Agriculture Policies How to mainstream climate change adaptation and mitigation into agriculture policies?," Advanced Draft of Policy Guidelines Version, (FAO, 2009): 20-21.

[2239] B, Metcz et al., IPCC, Climate Change: Mitigation, Working Group III contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2007B).

[2240] Elisabeth et al., Climate Change and the Right to Food: A Comprehensive Study.

CO2 emissions annually.[2241] The IPCC has also confirmed the agricultural sector's mitigation role by stressing that, soil carbon sequestration alone is responsible for 89% of agriculture's mitigation potential.[2242] In this respect, according to the FAO, 65% of agricultural mitigation potential lies in developing countries and that 50% of this potential is mainly to be obtained from limiting deforestation.[2243]

Accordingly, mitigation technologies in the agricultural sectors can include, for instance, increased carbon sinks that have the aim of removing CO2 from the atmosphere.[2244] This can be done, among other things, by doing away with deforestation and increasing forest coverage. The supply of biomass - organic matter - as a reliable source of energy and emission reductions of GHS, as noted, such as methane and nitrous oxide from agricultural activities by means of improved sustainable management practices also serve important mitigation results.[2245] Moreover, in this vein, besides the employment of actual/hard technologies, much potential is also to be found through the improvement of agricultural techniques and practices. As such, there is recognizable potential to be garnered from GHG reduction in agriculture through efforts to restore degraded lands, boost soil carbon sequestration and storage, energy efficiency, and combustion of agricultural residues.[2246] Aside from this, sustainable agriculture can additionally reduce emissions of non-CO2 gases, such as methane and nitrous oxide through the use of effective manure management technologies and fertilizer applications.[2247] However, the concern of technology development and most importantly its dissemination and transfer, as will be further examined below, are important prerequisites for it to meet the needed mitigation goals.[2248] Especially for developing countries, this has important implications due to challenges they may face related

[2241] Tim J. Lasalle & Paul Hepperly, Regenerative Organic Farming: A Solution to Global Warming (2008).
[2242] IPCC, Climate Change 2007: Mitigation, Contribution of Working of Group III Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (2007): 499-515. The majority of this carbon sequestration potential (about 70%) is concentrated in developing countries.
[2243] FAO, Climate change and food security: A Framework Document. Summary, (FAO Rome, 2007). The FAO has predicted an increase in GHG gases in South and East Asia, South America, as well as sub-Saharan Africa.
[2244] There is a very large, and currently untapped, potential for mitigation in the land sector, related to project activities that are not currently allowed under the Clean Development Mechanism (CDM), such as avoided deforestation, enhanced forest management and agroforestry. To a much lesser extent, it could also include soil sequestration in agricultural soils, which is extremely relevant to improving rural livelihoods and food security prospects: directly, through project activities that strengthen soil and water quality in areas already vulnerable today or indirectly, through increased diversification and income possibilities that are still land based, but away from high-risk subsistence food production. See, FAO, Climate Change Mitigation and Adaptation: Challenges and Opportunities in the Food Sector, (FAO, Natural Resources Management and Environment Department Rome, Italy, 2012); Ludivine Tamiotti et al., Trade and Climate Change: A report by the United Nations Environment Programme and the World Trade Organization, (WTO secretatiat, Geneva, 2009): 25ff.
[2245] Tamiotti et al., Trade and Climate Change: A report by the United Nations Environment Programme and the World Trade Organization, 25ff.
[2246] Ibid.
[2247] Agriculture also has a potential for mitigation of emissions of non-CO2 gases, such as methane and nitrous oxide through the use of manure management technologies and fertilizer applications.
[2248] Estimates of the aggregate economic costs of mitigation vary widely depending on methodologies and assumptions, but increase with the stringency of mitigation. Scenarios in which all countries of the world begin mitigation immediately, in which there is a single global carbon price, and in which all key technologies are available have been used as a cost-effective benchmark for estimating macro-economic mitigation costs, For more. see, IPCC, Climate Change: Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 20ff.

to cost, lack of knowledge and incentives for the farmers that work to prevent the transfer of these technologies.[2249]

As briefly noted above, the international environmental legal framework gives States the utmost flexibility to determine the manner for undertaking mitigation efforts to reduce their GHG emissions. For instance, the UNFCCC requires developed countries to adopt national policies in order to mitigate climate change.[2250]As can be recalled, the Framework Agreement puts mitigation obligations on developed countries to adopt national policies to mitigate climate change by limiting their anthropogenic GHG emissions.[2251] Similarly, in the Kyoto Protocol, the discretion is given to the State Parties in developing national measures as well as policies so as to meet their binding emission limits.[2252] Nonetheless, in the national objectives and policies they adopt, State Parties should ensure that the ultimate objective of the Framework Agreement[2253], to avoid dangerous interference with the climate system that would have adverse consequences, are complied with. In view of this objective, the agreement requires the Parties to undertake an impact assessment of the mitigation policies and measures proposed so as to ensure that there are no adverse effects on the economy, public health, and the environment.[2254]

In spite of their legal commitment under the UNFCCC, however, State Parties have not met their obligation. According to a study undertaken by the South Center, as of 2006[2255], most developed countries listed in Annex I of the UNFCCC, not including CEITs, have failed to comply with their commitments under Article 4.2(b) to return their anthropogenic greenhouse gas emissions, "individually or jointly to their 1990 levels".[2256] These countries have also not met their Kyoto Protocol[2257] targets for quantified emission reduction commitments.[2258] By and large, however, the target has been met largely by the EIT Annex I Parties that were able to do so due to economic difficulties they experienced in the 1990s that led to the collapse of industrial activities. As a result of this, Annex I non-EIT Parties, except for a few[2259], have not

[2249] J.U. Smith et al., "Projected changes in mineral soil carbon of European croplands and grasslands, 1990-2080", Global Change Biology 11, (2005): 2141-2152.
[2250] See, United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(1)(b).
[2251] Ibid.
[2252] See, Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Annex B.
[2253] See, United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 2. The provision reads, "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner".
[2254] Ibid, Article 4(f).
[2255] Margreet Wewerinke & Vicente P. Yu III, Addressing Climate Change Through Sustainable Development and the Promotion Human Rights, Research Papers 34, (South Center, 2010): 22 ff.
[2256] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(2)(b).
[2257] See, Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Annex B.
[2258] Wewerinke & Yu III, Addressing Climate Change Through Sustainable Development and the Promotion Human Rights, 22ff
[2259] The non-EIT Annex I Parties that have managed to return to or go below their 1990 levels as of 2006 are: Netherlands, EU, France, Belgium, Sweden, Monaco, United Kingdom, and Germany, if LULUCF is excluded; or Denmark, Netherlands, EU, Belgium, France, Finland, Monaco, United Kingdom, Germany, and Norway.

managed to return to their GHG to 1990 levels.[2260] In connection to this and in recognition of the delay in meeting the target set under the UNFCCC, for example, a landmark decision has recently been passed by the Dutch Appeals Court.[2261] This is because the Appeals Court has reached a decision under which it has ordered the Dutch government to accelerate carbon emission cuts. In this regard, the court has ruled that the serious nature of the climate crisis demanded GHG reductions of at least 25% by 2020 – when measured against 1990 levels – which is higher than the 17% drop that was planned by the administration.[2262] Following this landmark decision, the Supreme Court has passed yet another groundbreaking judgement by upholding the decision by ruling that the Dutch government is duty bound to "protect its citizens' human rights in the face of climate change and to this end, must reduce emissions by at least 25% compared with 1990 levels by the end of 2020".[2263] As such, this further confirms that the State Parties have not been able to meet their targets under the UNFCCC.

In this context, although, mitigation measures which aim to reduce GHGs are necessary avenues to remedy the adverse effects of climate change, as already explored above with regard to biofuel production, they also have resulted in some drawbacks further restraining the realization of the right to food.[2264] Therefore, a sole focus on mitigation effort in the agricultural sector may threaten to affect agricultural productivity and as a result food security.

Furthermore, an important concern often raised with regard to the development and adoption of response mechanisms to address climate change has to do with the issue of financing. In this vein, even though there is no precise predictions on the exact amount of funds required for global climate change mitigation efforts, estimates indicate that for the period between 2010-2025, developing countries mitigation costs could incur between $140 to $175 billion annually over the next 20 years.[2265] During the same period, adaptation costs are expected to average $30 to $100 billion a year.[2266] Contrary to the glaring need for financial support needed to support mitigation and adaptation measures, inadequacies have been observed to raise the needed funds which are worth to cover only 5% of the needed funding.[2267] The financial instruments that have been put in place are for the most part limited and inefficient. For instance, the main source of funding for financing mitigation to developing countries, the Clean Development Mechanism (CDM), has encountered design shortcomings and

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See, UNFCCC, "National greenhouse gas inventory data for the period 1990 to 2006", FCCC/SBI/2008/12, (17 November 2008).

[2260] Wewerinke & Yu III, Addressing Climate Change Through Sustainable Development and the Promotion Human Rights, Research Papers 34, 22ff.

[2261] See, Arthur Nelson, Dutch Appeals Court Upholds Landmark Climate Change Ruling, (October 9, 2018). Accessed from, https://www.theguardian.com/environment/2018/oct/09/dutch-appeals-court-upholds-landmark-climate-change-ruling?fbclid=IwAR3q1a4Udl4wxCU-1iwozEg8uOAgj46RU0csQg6ZWDEnScCa-ajgA5j9rck Accessed on 20/10/2018.

[2262] Ibid.

[2263] Isabella Kaminiski, Isabella Kaminiski, Dutch supreme court upholds landmark ruling demanding climate Action, (December 20, 2019), https://www.theguardian.com/world/2019/dec/20/dutch-supreme-court-upholds-landmark-ruling-demanding-climate-action, Accessed on 10/01/2020.

[2264] Caesens et al., Climate Change and the Right to Food: A Comprehensive Study.

[2265] World Bank, World Development Report, 2010, Development and Climate Change, 257ff.

[2266] Ibid. These figures can be compared with current development assistance of roughly $100 billion a year.

[2267] Ibid.

operational and administrative limits.[2268] Parallel to this, the extent of raising funds by the CDM is at the same time also limited. These inadequacies reveal that there needs to be a new source of income and finance to support these measures. The final section will further explore these concerns.

10.2. Adaptation

The section below will explore adaptation measures which have the aim of devising steps in order to adjust to the changing environment.

The IPCC defines adaptation to climate change as, "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities...".[2269] Adaptation to climate change as such involves learning to manage new risks emanating from climate change while at the same time strengthening resilience when confronted with such change.[2270] According to the IPCC, there are various adaptation measures that can be utilized by countries in response to climate change. For instance, such adaptation measures to be adopted can be ex-ante/anticipatory or ex-post/reactive[2271], private and public and autonomous and planned.[2272] Moreover, the adaptation is to be highly determined by adaptive capacity which refers to the ability or potential of a system to effectively respond to climate variability and change.[2273] As such, adaptation measures involve the taking of adjustments with a view to reduce or moderate the effects of climate change.[2274] These measures, although initially controversial[2275], have been

[2268] The principal instrument for catalyzing mitigation in developing countries is the CDM. It has grown beyond initial expectations, demonstrating the ability of markets to stimulate emission reductions, provide essential learning, raise awareness, and build capacity. But the CDM contains some inherent inefficiencies, raising questions about the overall process and its efficiency as a financing instrument.

[2269] See, Intergovernmental Panel on Climate Change, Climate change 2001 synthesis report: a summary for policymakers. (Intergovernmental Panel on Climate Change, Wembley, UK: 2001).

[2270] FAO, Climate Change and Food Security: A Framework Document, 45ff.

[2271] Lobell & Burke, Climate Change and Food Security: Adapting Agriculture to a Warmer World, 133-155; Pandey& Bhandari et al., Economic Costs of Drought and Rice Farmers' Coping Mechanisms: A Cross-Country Comparative Analysis. Ex ante measures, refer to those actions taken in anticipation of a given climate realization while ex post responses, are those actions undertaken after the event is realized. For instance, ex ante adaptations measure to variability center around strategies of diversification, in an attempt to offset the different effects that a given climate event might have on different crops and activities in a given year. Moreover, farmers growing rain-fed crops in a drought-prone environment might seek to diversify the location of their farm plots to take advantage of the high spatial variability of rainfall, grow a range of crops or crop varieties with different sensitivities to climate, or to diversify income sources into non-farm enterprises that are less sensitive to climate. Among the different ex post strategies farmers have taken some include, actions aimed at decreasing crop or welfare losses once climate events have been realized. Such strategies include drawing down cash reserves or stores of grain, borrowing from formal or informal credit markets or family, selling assets such as livestock, or migrating elsewhere in search for work in non-affected regions

[2272] Intergovernmental Panel on Climate Change, Climate change 2001 synthesis report: a summary for policymakers.

[2273] W.N Adger et al. "Assessment of adaptation practices, options, constraints and capacity", in Climate Change 2007: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (M.L. Parry et al. eds.), (Cambridge University Press, Cambridge: 2007): 717-743.

[2274] Bockel, & Smit, Climate Change and Agriculture Policies How to mainstream climate change adaptation and mitigation into agriculture policies?, 20-21.

devised with due consideration to the fact that even though all harmful emissions were altered, climate change is expected to increase due to past emissions.[2276] However, with due consideration to the cost of delay, the benefits emanating from planned adaptation have come to change the caution.[2277] The fact that adaptation measures are resource and wealth dependent, in that it is only developed countries that have the technologies that are to benefit from adaptation, has been a call for caution. This is because meaningful adaptation measures require developed countries to provide support to developing countries in their adaptation efforts.

This is due to the fact that there remains a significant capability difference between developing and developed countries when it comes to the availability of resources to effectively put in place adaptation measures.[2278] When compared to developed countries, for instance, that are well equipped with the technical, scientific, administrative, and financial capability to develop effective adaptation strategies[2279], developing countries lack both the financial as well as human resources that are needed for adaptation. For example, there is a discernible gap when it comes to research and university availability needed for the projection of the possible impact of climate change scenarios and adaptation strategies. Along with this, as will be contended further below, financial resources for adaptation are tight when compared to the size of the problem caused by climate change.[2280] When especially considering smallholder agriculture in developing countries, adaptive capacity which refers to, as noted, the ability to identify and implement effective actions in response to changing climatic circumstances, is highly restrained due to barriers for the adoption of improved practices and climate-smart technologies.[2281] Some of the limitations for smallholder farmers may include, lack of access to credit for investment.[2282] According to FAO[2283], this will have an effect mainly on poor households because they are usually unable to provide collateral for loans, and female producers, do not hold formal title to assets.[2284] This implies that there is a glaring need for the provision of financial support for developing countries to be able to cover the cost of adaptation measures.

The environmental legal framework also stresses the need for the maximization of adaptation capability especially for developing countries that are most vulnerable. In this regard, the UNFCCC deals with adaptation measures by requiring Annex I States to adopt national

[2275] See, Nicholas Stern, The Economics of Climate Change (2006).
[2276] IPCC, Summary for Policymakers, In Climate Change 2007.
[2277] See, Stern, The Economics of Climate Change (2006).
[2278] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 99ff.
[2279] Ibid. Industrialized countries will have many more resources to deal adequately with the challenge of adaptation. They have research institutions that can study the expected changes on micro- and meso-levels, which is a precondition for the design of effective adaptation policies. They have well functioning administrative structures in all parts of their countries, and they have the financial resources which allow the development of complex and potentially costly adaptation policies.
[2280] Ibid. Moreover, most developing countries are confronted with non-functioning infrastructure, insufficient administrative capacities, and missing political will are factors that will influence the development of adaptation policies in many countries.
[2281] Ibid.
[2282] FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security, 48ff.
[2283] Ibid.
[2284] Ibid.

strategies with a view to ensuring adaptation to climate change.[2285] Accordingly, the agreement stresses that in the measures to be adopted, the needs and interests of developing countries should be prioritized while giving special attention to the most vulnerable among them.[2286] In order to fulfill this objective, the Framework Agreement requires the provision of financial as well as technological assistance for developing countries so as to help them fulfill their obligations as well as meet the costs of adaptation.[2287] The Kyoto Protocol also gives due recognition to the importance of adaptation measures as provided under Article 10 through the deployment of adaptation technologies.[2288]

The UNFCCC has, in this regard, provided the possibility for funding the adaption capabilities of Least Developed Countries (LDCs) that have been recognized as highly vulnerable for climate change.[2289] In this context, LDCs planning, as well as funding for adaptation, is being facilitated through the development of National Adaptation Programmes of Action (NAPAs). In completing a NAPA, an LDC country is required to identify areas that need to be targeted so as to meet national climate change adaptation priorities.[2290] For instance, in LDCs that are among the most vulnerable to the adverse effects of climate change, 60% of the population is constituted by farmers[2291] contributing to an estimated 30% to the national GDP.[2292] This implies that in order to scale down on the ensuing negative effects, the employment of effective adaptation measures will be imperative.

Developing countries may include in their adaptation strategies, the utilization of inputs like synthetic fertilizers, pesticides and increased investments in irrigation and greenhouses so as to ensure the resilience of their crops.[2293] Nonetheless, due to lack of finance and technology, farmers in developing countries, must rely on available resources to adapt to the effects of climate change.[2294] For example, organic agriculture provides an important avenue for both

[2285] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(1)(b).
[2286] Ibid, Article 4(8), & 4(9). Countries that are particularly vulnerable to climate change and should receive special attention under the framework are: (1) least developed countries, (2) small islands, (3) countries with low-lying coastal areas, (4) countries with arid and semi-arid areas, forested areas and areas liable to forest decay, (5) countries with areas prone to natural disasters, (6) countries with areas liable to drought and desertification, (7) countries with areas of high urban atmospheric pollution, (8) countries with areas with fragile ecosystems, (9) countries whose economies are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels, and (10) landlocked and transit countries. See, Articles 4.8 and 4.9 of the UNFCCC.
[2287] Ibid, Article 4(8). In order to help Least Developing Countries (LDCs)t hat lack the financial capability to develop National Adaptation Programs of Action (NAPA), the Least Developed Countries Work Program was adopted during the COP-7, acknowledging that LDCs do not have the means to deal with the problems associated with adaptation to climate change.
[2288] Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Article 10.
[2289] See, United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(9).
[2290] Adger et al., Assessment of adaptation practices, options, constraints and capacity, Climate Change 2007, 717-743.
[2291] "Two thirds of these smallholder farmers live on remote and marginal lands under environmentally difficult conditions, such as mountainous areas or areas threatened by droughts and other natural disasters". See, Ziegler, Golay, Mahon, et al., The Fight for the Right to Food: Lessons Learned, 34-35.
[2292] See, M.N. Kandlikar & J.N. Risbey, Agricultural impacts of climate change: if adaptation is the answer, what is the question?, Climatic Change 45, (2000): 529-539.
[2293] Sara Borron, Building Resilience for an Unpredictable Future: How Organic Agriculture Can Help Farmers Adapt to Climate Change, (FAO, Rome, 2006): 7-11.
[2294] Ibid.

climate change mitigation as well as adaptation as noted above. In this sense, the agricultural sector, as discussed, is a large emitter of GHGs in the atmosphere especially in relation to the emission of anthropogenic gases methane, nitrous oxide, and CO2.[2295] At the same time, organic agriculture has a huge potential to reduce climate change both through its role in climate change mitigation, and adaptation even though the former has received less recognition.[2296]

A 2014 Synthesis Report by the IPCC, has revealed with "high confidence" that investment and innovation in environmentally sound infrastructure and technologies have the potential to reduce GHG emissions by enhancing resilience to climate change.[2297] Key measures that limit CO2-equivalent concentrations to low levels[2298] which are likely to limit warming to 2°C above pre-industrial levels include, decarbonizing which aims to reduce the carbon intensity of electricity generation[2299] as well as efficiency enhancements. Moreover, the IPCC report considers, with "high agreement", that behavioral changes are needed which aim to reduce energy demand without compromising development.[2300] As such, besides the need to mitigate GHGs in the atmosphere so as to avoid dangerous anthropogenic interference, adaptation to climate change through adjustment in natural or human systems is necessary.

[2295] Ibid.
[2296] Ibid.
[2297] IPCC, Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 20ff. The report has furthermore disclosed that Vulnerability to climate change, GHG emissions and the capacity for adaptation and mitigation are strongly influenced by livelihoods, lifestyles, behaviour and culture (medium evidence, medium agreement). The report also concluded that the social acceptability and/or effectiveness of climate policies are influenced by the extent to which they incentivize or depend on regionally appropriate changes in lifestyles or behaviours.
[2298] Ibid. Such measures aim to limit CO2 concentration to about 450 ppm CO2-eq.
[2299] With reference to renewale energy, a recent study has shown that the costs of producing electricity from various sources are changing. Specifically, in this regard energy from utility-scale solar plants, referring to plants that produce electricity that feeds into the grid, has seen a big price drop of 86% since 2009. See, Jeremy Berke, World Economic Forum, Renewable Energy is Getting Cheaper and it's Going to Change Everything, Published on (May 14/ 2018). Available at, https://www.weforum.org/agenda/2018/05/one-simple-chart-shows-why-an-energy-revolution-is-coming-and-who-is-likely-to-come-out-on-top/?fbclid=IwAR1QhHlW0FuzGxwGfPMFayLqSzcL170F8sbqLzUbvtx1SrfEo4l5txtFG_0 Accessed on 29/11/2018.
[2300] IPCC, Climate Change 2014: Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 20ff.

11. Biofuels: A Sustainable Path to Rectify GHG Emission?

Building on the above discussion, this sub-section divulges into biofuel/agrofuel[2301] production the demand of which is on a global rise. By focusing on this subject, the section aims to show how the right to adequate food is restrained as a result of large-scale land conversion as well as acquisition for agricultural crop production namely for agrofuel/biofuel.[2302]

The demand for the utilization of agricultural resources for non-food purposes, such as feedstock, has been on a rise in recent times, as will be elaborated more subsequently.[2303] What have been the underlying reasons behind the boom in their demand? In this regard, this rise for biofuel production as well as consumption, has primarily to do with the due consideration given to the vital importance of agricultural products as an alternative source of energy, for instance, as agrofuels[2304] and other industrial production processes.[2305] This connotes that the preoccupation with the production of biofuels is being driven with the conviction that they can be used as a supplement and alternative to fossil fuels, such as gasoline and diesel that have large GHG emission.[2306] Therefore, it is their use for transport that has generated the pressing demand and investment for their production.[2307]

In addition to this, the peak has also been driven by recent food price crises that culminated after the 2007-2008 price crisis.[2308] According to the World Bank, the commodity price hikes experienced between 2002-2008 was caused due to biofuels production, and ensuing consequences related to low grain stocks, large land-use shifts, speculative activity, as well as

[2301] Bioenergy in all its forms is energy produced from biomass, non-fossil material of biological originIncluding forest and agricultural plants, wild or cultivated as crops. Bioenergy can be harnessed from biomass in several ways. It can be processed and used in solid, liquid or gas forms. In relation to Agrofuels/biofuels, the nomenclature is inclusive of all agrofuels produced out of agriculture and livestock products. Some have been used for millennia, such as fuelwood, charcoal and animal dung. Newer sources include ethanol, biodiesel and biogas. Solid biofuel includes fuel wood, pellets, and charcoal. Liquid biofuel mainly includes bioethanol and biodiesel. Biofuel in form of gas includes methane. See, Promotion and Protection of all Human Rights, Civil, Political, Economic, Social and Cultural Rights, Including the Right To Development, Report of the Special Rapporteur on the Right to Food, Building resilience: A Human Rights Framework for World Food and Nutrition Security, A/HRC/9/23, (Human Rights Council, United Nations, General Assembly, 2008): 15ff; Noora-Lisa Aberman and Marc J. Cohen, Nutrition and Bioenergy in The Impact of Climate Change and Bioenergy on Nutrition, (B. Thompson and M.J. Cohen eds.), (FAO, Springer Science and Business Media B.V., 2012); Asbjørn Eide, The Right to Food and the Impact of Liquid Biofuels/Agrofules, The Right to Food Studies, (FAO, Rome, Italy, 2008).

[2302] Doornbusch and Steenblik, Biofuels: Is the Cure Worse than the Disease?, Background paper for OECD meeting in Paris, SG/SD/RT (3007), (11-12 September 2007): 3.

[2303] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 52-55; Louis Bockel, & Barry Smit, Climate Change and Agriculture Policies: How to mainstream climate change adaptation and mitigation into agriculture policies?, Advanced Draft of Policy Guidelines Version, (FAO, 2009): 19-20.

[2304] See, Promotion and Protection of all Human Rights, Civil, Political, Economic, Social and Cultural Rights, Including the Right To Development, Report of the Special Rapporteur on the Right to Food, Building resilience: A Human Rights Framework for World Food and Nutrition Security, A/HRC/9/23, (Human Rights Council, United Nations, General Assembly, 2008): 15ff; Aberman and Cohen, Nutrition and Bioenergy; Eide, The Right to Food and the Impact of Liquid Biofuels/Agrofules.

[2305] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 52-55.

[2306] Eide, The Right to Food and the Impact of Liquid Biofuels/Agrofules.

[2307] Ibid.

[2308] Nellemann et al., The Environmental Food Crisis- The Environment's Role in Averting Future Food Crises. A UNEP rapid response assessment, 80.

export bans.[2309] As a consequence, cash-rich, but resource-poor countries, *inter alia*, Asian countries like China, India, Japan, Malaysia, South Korea, and Middle East countries like the United Arab Emirates, Bahrain, Jordan, Kuwait, Qatar and Saudi Arabia have engaged in the acquisition or rent of large-scale land abroad - alternatively termed as land grabs - in order to ensure their food security.[2310] This is because non-food agricultural production is also being promoted as a long-term solution to deal with the high price of agricultural commodities and the resulting increase in demand for agroforestry products such as palm oil.[2311] As a response to addressing these challenge, different countries have resorted to the purchase/lease of land abroad for the cultivation of crops so as to support domestic demand.[2312] This search for new destinations for the production of biofuels as feedstock, in countries such as Indonesia and Malaysia in relation to palm oil, for instance, has to do with the realization that the EU[2313] and U.S., that are large consumers and producers of biofuels, will not be in a position to meet their demands in the future by relying on their own targets of production.[2314] What this connotes is that, in order to meet the growing demand for biofuel production domestically, these countries have resorted to the importation of biofuels[2315] alongside the raw materials needed for their production, from the countries that are endowed with abundant land for feedstock cultivation.[2316] According to estimates, in this regard[2317], by 2008, the total area of overseas

[2309] See, Jean Ziegler, Biofuels: A Right to Food Perspective, Making it Magazine., Last Updated, (March 26, 2010). Accessed from, http://www.makingitmagazine.net/?p=40, Accessed on 21/ 11/2018.,

[2310] See for example, Vera Songwe and Klaus Deininger, Foreign Investment in Agricultural Production: Opportunities and Challenges, (World Bank, 2009); GRAIN, The 2008 Land Grab for Food and Financial Security,(2008). available at: http://www.grain.org/go/landgrab. As being nations built in the desert, the Gulf States – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates have scarce soil and water with which to grow crops or raise livestock. This has galvanized the urge for landgrabs inforeign countires so as to ensure their food security.

[2311] See, OECD/FAO, OECD-FAO Agricultural Outlook 2011-2020. Among the most active countries owning, leasing or concessioning farmland overseas are China, India, Japan, Saudi Arabia, South Korea and United Arab Emirates while a number of other countries are only starting negotiations for the coming years.

[2312] See, Aberman and Cohen, Nutrition and Bioenergy; Seized: The 2008 Landgrabs for Food and Financial Security, GRAIN, (28 October, 2008). Available at, https://www.grain.org/article/entries/93-seized-the-2008-landgrab-for-food-and-financial-security. Accessed on 09/10/2018.

[2313] For instance, Germany the leading producer of biodiesel do not have the land available to grow feedstocks in the future. See, L. Cotula et al., Fuelling Exclusion? The Biofuels Boom and Poor People's Access to Land, (IIED, London, 2008).

[2314] See, Eide, The Right to Food and the Impact of Liquid Biofuels/Agrofules. Large-scale land acquisitions and leases: A set of core principles and measures to address the human rights challenge. See, Briefing Note by the Special Rapporteur on the Right to Food, (UN Office of the High Commissioner for Human Rights, Geneva: 2009); G. Fischer, et al., Global Agro-Ecological Assessment for Agriculture in the 21st Century, (FAO, Rome, Italy); Laxenburg, International Institute for Applied Systems Analysis (IIASA), (2002). Considering that close to 95% of the cropland in Asia has already been utilized, the demand for cropland for the sake of large-scale production is growingly being geared to Latin American and African countries where most of the demand for increased arable land will concentrate. These are also the regions which according to the Global Agro-ecological Assessment have been identified as being locations where most of the world's reserve agricultural land (up to 80%)is concentrated. In Sub-Saharan Africa countries that have been destinations include, are Cameroon, Ethiopia, the Tanzania, Democratic Republic of Congo, Madagascar, Mali, Somalia, Sudan, and Zambia. In Latin America, targets include Brazil, Cambodia, Indonesia, Kazakhstan, Pakistan, Russia or Ukraine.

[2315] See, P. Thoenes, Biofuels and Commodity Markets: Palm Oil Focus, (FAO, Rome, Italy: 2006).

[2316] See, Cotula, Fuelling Exclusion?; F.O. Licht, "World Ethanol and Biofuels Report," Vol. 6, No. 9, (10 January 2008). Available on, www.agra-net.com. Ethanol imports destined to the EU as of 2007 rose by 43% in the first three quarters of 2007 up to 650 million litres, mainly from Brazil, the US and Pakistan.

[2317] See, OECD/FAO, OECD-FAO Agricultural Outlook 2011-2020.

farmland held in different countries was estimated at 5.7 million hectares (ha) or 0.4% of the global cropland area.

The demand for biofuels has been on a global rise[2318] owing to the expectation that biofuel production has low CO2 emission and can serve as a good alternative for fossil fuels. Besides their low CO2 emission potential, the growing attention being paid to biofuels, from the point of view of the developing countries that are considered destinations, has to do with the expectation that their production may help in improving food security by empowering farmers ability to buy food on the market.[2319] Governments in developing countries have played and continue to play a marked role in this process as they have been giving away land for foreign investors which they often term as having been underutilized or "idle land", for biofuel production.[2320] Moreover, biofuel production is also expected to provide better opportunities for improved terms of trade (tot) to the host countries by enabling farmers to get a better price for their agricultural commodities.[2321] For the countries that possess abundant land, however, lacking other natural endowments, biofuels have been prescribed as new development and investment opportunities.[2322] At a period when hikes in oil price are predicted, biofuel production has also been recommended to poor countries as a sustainable way to ensure energy security.[2323]

More specifically, biofuels, such as biodiesel made from palm oil and ethanol made from sugarcane, corn and soybean, accounted for about 1% of the total road transport in 2005, while this rate is expected to reach 25% by 2050, with the EU[2324] having set targets as high as 10% by 2020.[2325] For developing countries, such as Indonesia, and, Malaysia[2326], for instance,

[2318] FAO, the state of food and agriculture (FAO, Rome, Italy 2008g). Globally, bioethanol production is mostly concentrated in Brazil and the United States, which together accounted for nearly 90% of the total in 2007. Biodiesel production is geographically concentrated within the European Union, which accounted for 60% of global output in 2007. Moreover, ethanol accounts for 40% of non-diesel fuel in Brazil, which produces nearly 40% of the world's total production, which stood at 9 billion liters in 2007.

[2319] Cotula et al., Fuelling Exclusion?.

[2320] Ibid; H.E.S. Namburete, "Mozambique biofuels", Presentation at the African Green Revolution Conference, Oslo, Norway, (31 August -2 September 2006). For instance, the government of Mozambique has stated that only 9% of the county's 36 million ha of arable land are currently in use and that there is the possibility of bringing into production an additional 41.2 million ha of marginal land currently not being used.

[2321] Cotula et al., Fuelling Exclusion?.

[2322] Ibid.

[2323] Ibid.

[2324] The EU has as per the Renewable Energy Directive (2009/28/EC) has set targets that are to be met by Member States (MS). In this regard, the Directive concurs, inter alia, that MS must derive 20 per cent of overall energy consumption, across all sectors, from renewable sources by 2020; ten per cent of energy consumption within the transport sector must be derived from renewable sources by 2020; and greenhouse gas emission reductions targets are set, amounting to 50 per cent relative to fossil fuels by 2017 and 60 per cent by 2018 for fuels produced in 2017 or later.

[2325] FAO, The state of food and agriculture; World Bank, World Development Report 2007: Development and the Next Generation; FAO, Sustainable Bioenergy and Food Security, Towards an international framework, (FAO 2008). In 2007, liquid biofuel contributed only 0.36 of the total energy consumption in the world. To achieve this modest fraction of the total energy use, 23 percent of US coarse grain production was used to produce ethanol and in the EU about 47 percent of all vegetable oil production was used to produce biodiesel.

[2326] Emily B. Fitzherbert et al., How will oil palm expansion affect biodiversity? Trends in Ecology and Evolution 23 (10), (2008): 528-545; UNEP, In Dead Water. Merging of Climate Change with Pollution, Over-Harvest, and Infestations in the World's Fishing Grounds, (UNEP/GRID-Arendal, Arendal, Norway 2008).

the peak in the demand for biofuels has been conceived as a means of investment in rural areas to improve livelihoods and increase export earnings.[2327]

Notwithstanding the afore discussions on the drivers as well as anticipated benefits of biofuels/agrofuels especially in terms providing an alternative for dependence on fossil fuel, which is the largest contributor of global GHG emission in energy, as will be seen below, their production process has not actually resulted in a sustainable substitute of energy and has as a result caused environmental impacts.[2328] As a consequence of this, their production process has exhibited restrictions on the realization of the right to food.

Starting with the concern raised that biofuels as not being a sustainable source of energy, the unease raised has to do with the fact that in terms of energy efficiency, biofuels only offer a very small gain over petrol, and that at present, their production has resulted in a minimal reduction in GHG emission.[2329] In connection to this, some studies[2330] have shown that biofuels will actually have a negative effect on GHG emissions.[2331] In this regard, when GHG reduction emanating from the use of biofuel is to be compared with that of fossil fuels, which depends upon land use and the source of land for biofuels production, as a result of clearing of new land for biofuels production, large emissions of GHGs can be generated which is often referred to as "carbon debt[2332]".[2333] This elucidates that the cultivation of feedstocks such as agricultural raw materials like maize, palm oil or sugar cane, for biofuel production, demand the possession of as well as the conversion[2334] of large tracts of land into plantations[2335] as

[2327] FAO, The State of Food and Agriculture; World Bank, World Development Report 2007: Development and the Next Generation. The US is the largest producer and consumer of bioethanol, followed by Brazil. Brazil has now used 2.7 million ha of land area for this production (4.5% of the cropland area), mainly sugar cane. Production of biofuels has had inconclusive results. This is because, while biofuels are a potential low-carbon energy source, the conversion of rainforests, peatlands, savannas, or grasslands to produce biofuels in the US, Brazil and Southeast Asia may create a "biofuel carbon debt" by releasing 17 to 420 times more CO2 than the annual greenhouse gas reductions that these bio fuels would provide by displacing fossil fuels. Joseph Fargione et al., Land clearing and the biofuel carbon debt, Science 319, (2008):1235-1238; S. Seitzinger and R. Lee, Land-based sources of nutrients to Large Marine Ecosystems, (2008): 81- 97; UNEP Large Marine Ecosystem Report: A perspective on changing conditions in LMEs of the world's Regional Seas. UNEP Regional Seas Report and Studies No. 182, (United Nations Environment Programme, Nairobi, Kenya).

[2328] This is because the process of production of biofuels will create up to 420 times more CO2 than the annual greenhouse gas reductions that these biofuels would provide by replacing fossil fuels. See, Ziegler, Biofuels: A Right o Food Perspective.

[2329] See, Von, When food makes fuel: The promises and challenges of Biofuels.

[2330] T. Searchinger, et al., Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change, Science, 319 (5867), (2008):1238-1240.

[2331] Ziegler, Biofuels: A Right to Food Perspective.

[2332] Ibid. "Biofuel carbon debt" is used to imply that the process of production of biofuels will create up to 420 times more CO2 than the annual greenhouse gas reductions that these biofuels would provide by replacing fossil fuels.

[2333] Aberman and Cohen, Nutrition and Bioenergy; Jean Ziegler, Burning food crops to produce biofuels is a crime against humanity; EU leaders must vote against a biofuels policy that is increasing world hunger and causing environmental devastation, The Guardina, Last Updated, (26 November, 2013). Accessed from, https://www.theguardian.com/global-development/poverty-matters/2013/nov/26/burning-food-crops-biofuels-crime-humanity. , Accessed on 21,11, 2018,. According to the former special Rapporteur on the right to food, Jean Ziegler, "The demand for additional land to accommodate EU biofuels plans means expanding cropland, which will result in felled forests, plundered peatlands and ploughed prairies. The evidence is increasingly clear that the climate change benefits of most biofuels are negligible or nil".

[2334] For instance, according to former special Rapporteur on the right to food, Jean Ziegler converting rainforests, peatland, savannas, or grasslands into fields to produce food crop–based biofuels in Brazil, Malaysia, Indonesia,

result contributing to high rates of GHS. Consequently, this peak in demand has galvanized the increasing incentive for land leases and/or acquisition in the countries, *inter alia*, Sub-Saharan Africa[2336], where land ownership rights are insufficiently protected.[2337] In this regard, studies[2338] conducted by FAO and the World Bank (WB), have concurred that massive amount of land has already been acquired for the purpose of biofuel production in developing countries.

In the light of this, how have these developments, impinged on the realization of the right to food?

Firstly, the pace with which agrofuel production has increased led to hikes in the price of some crops in the international market.[2339] This is due to the fact that the food crops being utilized as energy crops, such as ethanol, also represent a major part for the diets of poor people. Energy crops that are on high demand in the international market for biofuel production include, for example, maize, sugar cane, soy, cassava, palm oil and sorghum which constitute close to 30% of mean calorie consumption of people living in chronic hunger.[2340] As such, as a consequence of peaks in biofuel production, the process of land conversion from food to the production of energy crops has resulted in the reduction of food supply and as a result, has caused hikes in food prices as a consequence restraining the affordability of food supply.[2341] For instance, according to an internal World Bank memorandum, change in land use for the production of biofuels has been responsible for 75% of the hikes in food prices.[2342] A similar study by FAO/OECD in 2007[2343] has revealed that,

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and the United States, creates a "biofuel carbon debt". Hence, biofuel production, in such conditions, has the function of an environmental Trojan horse. See, Ziegler, Biofuels: A Right to Food Perspective.

[2335] For instance, ethanol produced from sugar cane and corn. has been behind deforestation in Brazil as well as a weak energetic balance in the U.S. In a similar vein, the production of biodiesel produced from palm oil has been blamed for causing deforestation in Indonesia. See, Elisabeth et al., Climate Change and the Right to Food: A Comprehensive Study, 31-33.

[2336] Sub-Saharan Africa has become a hotspot for land investment due to the consideration that, land is perceived to be cheap and abundant, the enforcement of regulatory frameworks is often weak; and most African countries enjoy trade preferences with the EU. See, Note on The Impacts of The EU Biofuels Policy on The Right to Food, Mandate of the Special Rapporteur on the right to food, (United Nations Human Rights office of the High Commission: 23April 2013).

[2337] Ibid. According to the European Commission, an estimated 6.6 million hectares of additional arable land globally was cultivated for biofuels production between 2003 and 2008.

[2338] FAO, Land grab or development opportunity? Agricultural investment and international land deals in Africa, (2009); World Bank, Rising Global Interest in Farmland, Can it Yield Sustainable and Equitable Benefits? (2011). Similarly, a world Bank study, based on a review of 405 large-scale agricultural investment projects, showed that 21 per cent of these projects were for the production of energy crops.

[2339] Promotion and Protection of all Human Rights, Civil, Political, Economic, Social and Cultural Rights, Including the Right to Development, Report of the Special Rapporteur on the Right to Food, Building resilience: A Human Rights Framework for World Food and Nutrition Security, A/HRC/9/23, (Human Rights Council, United Nations, General Assembly, 2008): 15ff.

[2340] R. Naylor et al., 'The Ripple Effect -Biofuels, Food Security, and the Environment', Environment, Vol. 49, No. 9, (2007). This said however, according to the former Special Rapporteur on the right to food, Olivier De Schutter, such price increases are not per se problematic; under certain conditions, particularly if they benefit rural households who are net food sellers and if the net food buyers are protected by targeted measures aimed at increasing their purchasing power, such increases may in fact have benevolent effects, particularly in a dynamic perspective.

[2341] Emanuelli et al, Red Sugars, Green Deserts, 86ff.

[2342] Ibid.

[2343] OECD-FAO, Agricultural Outlook 2008-2017, (OECD, Paris. 2008).

due to the production of biofuels, 20-50% of price peak in food commodities was expected to take place in 2016.[2344] A 2011 report on food price volatility has moreover disclosed that the prices of food commodities are markedly higher than they would have been under a context of no biofuel production.[2345] As a consequence of hikes in food price, the realization of the right to adequate food is significantly strained.[2346] This is so because rising food prices will directly make food inaccessible[2347] for poor households that spend a considerable share of their income on food.[2348] Additionally, the constraint posed by rising food prices will also hinge upon poor small-scale farmers. Even though small-scale farmers may benefit by selling their produce on the market, they are for the most part net-food buyers.[2349] The underlying reason for this is that these farmers rely on a combination of sources of income in order to ensure food provision, especially during lean seasons.[2350] Moreover, even when food prices have gone up in the international market for food, due to their weak bargaining position, small-scale farmers, mainly those living in low-income countries that have minimal means to protect the public against hikes in price, are forced to sell their crops at a low price.[2351]

Secondly, in addition to rising crop prices, the rush for biofuel production impedes the realization of the right to food because the production of agrofuels, in this regard bioethanol, for instance, which currently constitutes the largest share for biofuel production, relies on land concentration and large-scale agriculture which causes a large percentage of GHG emission.[2352] This is because industrial agriculture for energy crop production relies on the extensive utilization of large amounts of "water, agrochemicals, tractors, transportation, processing, commercialization and trade", which have large amount of GHG generating fossil

[2344] Don Ethridge et al., World cotton outlook: Projections to 2015/16, Belt wide Cotton Conferences, San Antonio, Texas, (January 3-6, 2006). The demand for non-food crops like cotton is projected to increase to an additional 2% of cropland area by 2030 and 3% by 2050. The amount of designated area for biofuel and cotton alone could be in the range of 5–13% by 2050 and have the potential to negatively impact food production and biodiversity. Similarly, according to a World Bank Index for food prices from 2002-2008, the research has disclosed that biofuel production in the U.S, where 25% of the production of maize went for ethanol production, and in the EU, where 47% of vegetable oil production is used for biofuel production takes a large share for the price hikes that ensued. See, Donald Mitchell, A Note on Rising Food Prices. Draft April 8, (2008).

[2345] See, World Bank et al., Price Volatility in Food and Agricultural Markets: Policy Responses, (2011). The report which assessed price voletality in food commodities was a join research effort that was prepared by nine international organizations, including UN agencies.

[2346] For more, see, UN Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999).

[2347] According to General Comment 12, Economic accessibility implies that personal or household financial costs associated with the acquisition of food for an adequate diet should be at a level such that the attainment and satisfaction of other basic needs are not threatened or compromised. See, The UN Committee on Economic, Social and Cultural Rights, General Comment 12 (1999): Paragraph 13.

[2348] See, Note on the Impacts of the EU Biofuels Policy on The Right to Food, Mandate of the Special Rapporteur on the right to food. Poor households spend between 70-80% of their earnings on food.

[2349] See, Note on the Impacts of the EU Biofuels Policy on The Right to Food, Mandate of the Special Rapporteur on the right to food.

[2350] Ibid.

[2351] Small-scale farmers are unable to reap the benefits of higher commodity prices in the international market because of their lack of information and a lack of storage facilities, and in part because they face a limited number of dominant commodity buyers, who can dictate relatively low prices to the producers.

[2352] See, Promotion and Protection of All Human Rights, Civil, Political, Economic, Social and Cultural Rights, Including the Right to Development, Report of the Special Rapporteur on the Right to Food, Building resilience: A Human Rights Framework for World Food and Nutrition Security, A/HRC/9/23, (Human Rights Council, United Nations, General Assembly, 2008): 15ff.

fuels.[2353] As a case in point, for instance, between 2000-2006, with the view to compensate for the shortage in arable land needed for feedstock so as to produce biofuels and to substitute for rapeseed oil diverted from food to fuel uses, palm oil imports of the EU have doubled.[2354] Such land use change often termed, indirect land-use change[2355], however, rolls-back the land which is to be used in other countries. This is because a number of developing countries are setting aside land both for energy crops production as well as for the sake of meeting EU food production demands.[2356] This trend nevertheless threatens to take away the land available for domestic food production needed to feed households as well as local communities.[2357] As a consequence, the growing competition for food production inputs, *inter alia*, access to land, water, and other resources, will hinge upon the realization of the right to food in these developing countries, by snatching away needed inputs for food production. As the above examples demonstrate, the rising demand for the production of energy crops, by the EU for instance, when looked at from the angle of climate change and State responsibility, is in contravention to the State duty to respect the right to adequate food. In this vein, the CESCR[2358] has highlighted that States as part of their duty to respect the right to food, should avoid contributing to practices that harm the environment which as a consequence constrains access of the public to adequate food.[2359] The current rush for biofuel production which is considered a viable alternative to fossil fuels, by Annex I countries notably the EU, is as such in violation of the State duty to respect the right to adequate food. Biofuel production additionally threatens the deterioration and depredation of resources such as water.[2360] In line with this, this development under which developing countries mainly in Sub-Saharan Africa, Asia, and Latin America have given large tracts of land for biofuel production, shows that the States concerned have acted in contravention of their international duties. These developments have had a negative effect on the right to adequate food. This is because, by giving away the land that provides the basic means for livelihood for local communities, the State Parties to the international human rights instruments[2361] (mainly, the ICESCR) that are acting in violation of their duty to fulfill the right to adequate food[2362] which requires the State concerned to act proactively to create an enabling environment where people can become self-reliant for food production.[2363] However, in the circumstance that a State knowingly contributes to an environment that will expose the public to become more dependent, as a consequence of losses in land, for instance, the State concerned is acting in violation of its

[2353] Emanuelli et al., Red Sugars, Green Deserts, 86ff.
[2354] Thoenes, Biofuels and Commodity Markets: Palm Oil Focus.
[2355] Indirect landuse change takes place when land previously used to grow food or animal feed is turned over to grow biofuels thereby displacing the original land use into new areas. See, Note on The Impacts of The EU Biofuels Policy on The Right to Food, Mandate of the Special Rapporteur on the right to food.
[2356] Ibid.
[2357] Ibid.
[2358] UN Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999).
[2359] Elisabeth et al., Climate Change and The Right to Food: A Comprehensive Study, 42 -45.
[2360] Emanuelli et al., Red Sugars, Green Deserts, 86ff.
[2361] See, for example, Convention on the Rights of the Child, (20 November 1989), G.A. Res. 44/25, U.N. GAOR, 44th Sess.: Article 24(2)(c).
[2362] See, UN Committee on Economic, Social and Cultural Rights, General Comment 12 (1999): Paragraph 15; UN Committee on Economic, Social and Cultural Rights (CESCR), General comment No. 3 (1990).
[2363] FAO General Council, Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food (2004).

duty to fulfill. In this vein, failure by the State to help the population so affected due to the loss of resources for livelihood, in finding new food alternatives, leads to a violation of the duty to fulfill the right to adequate food.[2364]

Thirdly, in addition to price hikes, and promotion of large-scale agriculture, the form of production that underlies biofuels, threatens to seize land available for agricultural production for small-scale farmers as well as that available for indigenous populations.[2365] In this vein, national policy, as well as market incentives that promote the conversion of land to biofuel production, will automatically lead to a rise in the value of land.[2366] In this regard, according to the former Special Rapporteur on the Right to Food, Olivier de Schutter, the EU's Renewable Energy Directive[2367], besides putting in place mandatory targets and subsidizing biofuels, "... not only creates a heavily distorted biofuel market, but it also encourages an artificial land market, boosting land values and transforming it into a profitable asset for investors".[2368] Hence, due to the opportunity foreseen, poor farmers that have made their living on the land being sought will risk being displaced as a result further restraining their food security.[2369] The right to food is restrained in this context because, in order to make way for the production of biofuels, the possibilities of poor farmers to feed themselves either directly from productive land or other natural resources will be taken away.[2370] Moreover, according to the UN Committee on ESCR, this is in violation of the right to adequate food because biofuel production seizes the land available and needed "...either for feeding oneself directly from productive land or other natural resources".[2371] Likewise, as a consequence of this, the economic accessibility of adequate food will be slashed in that these farmers that no longer possess productive land, may not have the financial means so as to acquire food for an adequate diet which "...should be at a level such that the attainment and satisfaction of other basic needs are not threatened or compromised".[2372]

Moreover, small-scale farmers constitute a small share in the production of energy crops as the production process requires an integrated industrial organization of production, which comprises factory processing, transport, and distribution.[2373] This further ascertains how the production of biofuels does not create economic incentives for farmers to be able to ensure the provision of adequate food for themselves and their families.[2374] This is against the common

[2364] Ibid.
[2365] Promotion and Protection of All Human Rights, Civil, Political, Economic, Social and Cultural Rights, Including the Right to Development, Report of the Special Rapporteur on the Right to Food, Building resilience: A Human Rights Framework for World Food and Nutrition Security, A/HRC/9/23, (Human Rights Council, United Nations, General Assembly, 2008): 15ff.
[2366] Cotula et al., Fuelling Exclusion?.
[2367] See, European Union Renewable Energy Directive, 2009/28/EC.
[2368] See, Mitchell, Biofuels in Africa: Opportunities, Prospects, and Challenges.
[2369] Cotula et al., Fuelling Exclusion?., Although in some cases, this could give new opportunities to poor farmers.
[2370] The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph 12.
[2371] Ibid.
[2372] Ibid, Paragraph 13.
[2373] See, Eide, The Right to Food and the Impact of Liquid Biofuels/Agrofules.
[2374] See, The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraph, 12.

expectation that biofuels will help ensure rural development and poverty alleviation in the regions that have become common destinations.[2375] Notwithstanding this, however, as noted above, there is evidence[2376] to contend that the production process for biofuels demands a mode of farming that is capital - intensive and as a result only benefits large agricultural producers - as opposed to small-scale farmers - that have better connections to the markets.[2377] As such, this denotes that the benefits to be garnered from the production process would go towards international investors and local elites, at the expense of the community that is poverty and food insecurity stricken.[2378] Therefore, this development impinges on the right to food of local communities due to the fact that an area where small-scale farming was practiced is replaced by large-scale and heavily-mechanized monocultures. This will give way to a context where many of the former land users end up jobless and landless further restraining their economic as well as physical accessibility to ensure adequate food.[2379]

Fourthly, it is important to note that the demand for biofuels is mainly driven by developed countries, while production is concentrated in developing countries that possess the comparative advantage for biofuel production in a more efficient and cost-effective manner.[2380] As discussed further in chapter three of the research in relation to the Agreement on Agriculture, this trend promotes a form of development focused on cash crop production in developing countries so as to satisfy the needs of developed countries. Nevertheless, this may lead to distorted development benefiting the interest of a minority producing crops for exports against the interests of other agricultural producers.[2381] As high demand for biofuels is bound to lead to price increases for food, people's access to land for production will be snatched. Nevertheless, this trend will happen alongside increasing oil prices which means that the effect will automatically result in an increase of agricultural prices because of its influence on the prices for agricultural input.[2382] In relation to this, the increase in demand for agricultural products will cause a reduction in the land available for both pasture and grazing.[2383]

As such, as can be grasped from this discussion, the peak in the demand for biofuel production as an alternative for fossil fuel, for instance, besides providing a questionable

[2375] See, Note on the Impacts of the EU Biofuels Policy on The Right to Food, Mandate of the Special Rapporteur on the right to food.
[2376] United Nations High Level Panel of Experts on Food Security and Nutrition, Land tenure and International Investments in Agriculture, (FAO Committee on World Food Security, 2011); Eide, The Right to Food and the Impact of Liquid Biofuels (agrofuels), (FAO, 2008); I. Maltsoglou and Y. Khwaja, The BEFS Analysis for Tanzania, (2010).
[2377] See, Note on the Impacts of the EU Biofuels Policy on The Right to Food, Mandate of the Special Rapporteur on the right to food.
[2378] For example, in a recently leased land in Mali, which could conservatively sustain 112,537 farming families, in the hands of 22 investors who plan to employ a few thousand plantation workers. See, Note on the Impacts of the EU Biofuels Policy on The Right to Food.
[2379] Ibid; The United Nations Committee on Economic, Social and Cultural Rights, (CESCR), "General Comment No. 12 (1999): Paragraphs 12 and 13.
[2380] Promotion and Protection of All Human Rights, Civil, Political, Economic, Social and Cultural Rights, Including the Right to Development, Report of the Special Rapporteur on the Right to Food, Building resilience: A Human Rights Framework for World Food and Nutrition Security, A/HRC/9/23, (Human Rights Council, United Nations, General Assembly, 2008): 15ff.
[2381] Ibid.
[2382] Bals et al., Climate Change, Food Security and the Right to Adequate Food, 52-55.
[2383] Ibid.

alternative to reduce GHGs, has resulted in restrictions on the realization of the right to adequate food.

12. The Right to Benefit from Science: The Transfer of Environmentally Sound Technology

The UNFCCC, recognizing the pertinent importance of technology and its transfer, has dealt with the transfer of environmentally sound technologies[2384] (hereafter, EST) under several of its provisions. With a due focus on the need to direct both the direction of technology transfer as well as the funding to developing countries that lack the financial capability to develop adaptation capabilities, the Framework Agreement specifically focuses on the transfer of EST by Annex II State Parties.

Bearing this in mind, what is the nature of obligations enshrined in the Framework Agreement regarding EST? To start off this discussion, Article 4(3), for example, requires, developed country parties as included under Annex II to provide new and additional financial resources to meet the agreed full costs incurred by developing country parties in complying with their obligations.[2385] The Framework Agreement moreover posits that Annex II parties shall also provide such financial resources including that for the transfer of technology, needed by the developing country parties to meet the costs of implementing measures".[2386] In line with this, Article 4(5), captures this focus by expounding that "developed country Parties included in Annex II shall take all practicable steps **to promote, facilitate and finance, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties**, to enable them to implement the provisions of the Convention" (emphasis added).[2387] The same provision further requires Annex II parties to support the development of endogenous capability and technologies of developing countries.

Likewise, the Kyoto Protocol to the UNFCCC has also incorporated the essence of this provision, albeit with some modifications as to the meaning and implication of some of the wordings. Accordingly, under Article 11(c), it has added two main clarifications. The first of these deals with how the transfer of and access to environmentally sound technologies and know-how should include, "the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain".[2388] The second clarification has been added with due consideration to the role of the private sector in technology transfer.[2389] It has been inserted that the taking of "practical

[2384] See, Martin Khor, Climate Change, Technology and Intellectual Property Rights: Context and Recent Negotiations, Research Paper 45, (South Center, Switzerland, 2012). The central role of technology transfers to developing countries as well as the development of endogenous technology in these countries were also recognized in the 1992 Rio Summit, as well as in its related conventions such as the United Nations Framework Convention on Climate Change (UNFCCC). As such, it was recognized that technology transfer had to be undertaken beyond the commercial arena, and that a pro-active role of public policy at national and international levels is required to enable developing countries' access to technology.
[2385] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(3).
[2386] Ibid.
[2387] Ibid, Article 4(5).
[2388] See, Kyoto Protocol to the Framework Convention on Climate Change, (December 10): Article 11(c).
[2389] For more on technology transfer by the private sector, check chapter four of this research.

steps"[2390] by Annex II States to be indicative of "the creation of an enabling environment for the private sector".[2391]

Similarly, EST is covered under Article 4(8) of the UNFCCC, which asserts that parties shall give full consideration to those actions necessary under the Convention, "including **actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties** that have risen from the adverse effects of climate change and/or the impact of the implementation of response measures" (emphasis added).[2392] EST is furthermore addressed under Article 4(9) which reiterates the afore provisions by contending that "State Parties shall take into full consideration the **special needs and circumstances of LDCs in their funding and transfer of technology actions**" (emphasis added).[2393]

With the above discussion in mind, how have EST been delineated in the UNFCCC? Environmentally sound technologies have been defined as referring to hard and soft technologies,

> "... that protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes and are compatible with nationally determined socio-economic, cultural and environmental priorities...".[2394]

In this regard, a pertinent issue of importance in relation to the transfer of EST has to do with the issue of funding. Under this milieu, the UNFCCC provisions in relation to the need for the EST to developing countries are supposed to take place pursuant to Articles 4(3), 4(4), and 4(5), through the UNFCCC's financial mechanism as operated by the Global Environmental Facility (GEF).[2395] In accordance with Article 11, at COP 17 in 2011, the State Parties

[2390] See, United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): article 4(6).
[2391] See, Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Article 11(c).
[2392] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(8). Article 4 (7), also deals with common but differentiated principle of the State parties concerned by making the effective implementation by developing country State Parties of their obligations dependent on developed countries effective implementation of their commitments under the agreement especially in relation to financial resources and transfer of technology. Moreover, the provision ascertains that this assessment will also take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties. The insertion of this provision in the UNFCC can be explained by the fear of developing countries during the negotiation process that action to curb climate change could inhibit their developmental policies regarding economic and social development and poverty eradication. See also, Thomas Cottier et al., International Trade Regulations and the Mitigation of Climate Change, World Trade Forum, (Cambridge University Press, UK. 2009):283ff.
[2393] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 4(9).
[2394] IPCC, Methodological and Technological Issues in Technology Transfer, Special Report of Working Group III of the Intergovernmental Panel on Climate Change.
[2395] The GEF has been established under Article 11(1) to 11(4). Most recently, as of June 2018**,** the Green Climate Fund (GCF) and the Global Environment Facility (GEF) agreed to take joint steps to improve climate finance flows to best meet the needs of developing countries in tackling the global climate challenge. The decision has been made with consideration to how the GCF and the GEF work closely for the sake of helping countries implement the Paris Agreement as operating entities of the Financial Mechanism of the United Nations Framework Convention on Climate Change (UNFCCC). See, Green Climate Fund, GCF and GEF launch joint

reached a decision to designate the Green Climate Fund (GCF) as an operating entity of the Framework Agreement. Moreover, this technology transfer financing is to be carried out either on a grant or concessional basis.[2396] As discussed above, the GEF is subject to review by the COP every four years.[2397] Moreover, developed countries may resort to the provision of financial resources to developing countries for technology transfer through bilateral, regional, or multilateral channels.[2398] This said Annex II developed Parties are required to include in their national communications the details of measures that they take in order to comply with their Article 4 (5) obligations.[2399]

The UNFCCC devotes a large space for the need to transfer technology to developing countries so as to help them implement their commitments under the Framework Agreement. Similarly, the Kyoto Protocol has taken a prominent role in the issue of technology transfer through its Clean Development Mechanism (CDM).[2400] As already attested in preceding discussions, the CDM provided for projects in developing countries that are aimed at achieving a reduction in GHGs. Such projects are expected to generate certified emission reduction credits (CER) that can help developed countries to secure GHG reduction commitments.[2401] In this regard, depending on the importance of reduction in developed countries, the CDM can provide a considerable incentive for private investors to finance the use of climate-friendly technologies in developing countries.[2402]

In spite of this recognition for the importance of transfer of EST, however, there was witnessed a negligible amount of transfer of climate-friendly technology to developing countries under the UNFCCC in 2007.[2403] According to a report by the UNFCCC Expert Group on Technology Transfer, as of 2007, the UNFCCC's provisions on technology transfer have not yet been implemented by developed country parties.[2404] More in detail, a UNFCCC

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effort to improve flow of climate finance, Accessed from, www.climatechangenews.com/2018/06/27/gcf-gef-launch-joint-effort-improve-flow-climate finance/, Last Updated, 27/06/2018, Accessed on 13/11/2018.

[2396] United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 11(2).

[2397] See, Annex of COP decision 3/CP.4 adopted in late 1998 which contains the guidelines and objectives for the review of the financial mechanism. Additional guidelines and objectives for such review were provided by the COP in December 2007 in COP decision 6/CP.13. Three reviews of the financial mechanism have taken place since the review guidelines were adopted in late 1998. See also, UNFCCC, Article 11(1).

[2398] See, United Nations Framework Convention on Climate Change (FCCC), (May 9, 1992): Article 11(5).

[2399] Ibid, Article 12 (3). Financing obligations under Articles 4.(3), 4.(4). Such measures are taken into account in the context of the COP's review of the financial mechanism that takes place every four years.

[2400] See, Kyoto Protocol to the Framework Convention on Climate Change, (December 10, 1997): Article 12.

[2401] Ibid. This said however, notwithstanding the large, and currently untapped, potential for mitigation in the land sector related to project activities, such as avoided deforestation, enhanced forest management and agroforestry, are not currently allowed under the Clean Development Mechanism (CDM). See, FAO, Climate Change Mitigation and Adaptation: Challenges and Opportitunites in the Food Sector.

[2402] See, Grubb et al., The Kyoto Protocol, 246.

[2403] See, Khor, "Climate Change, Technology and Intellectual Property Rights,"; World Bank, World Development Report: Development and Climate Change, 257ff. With regard to the CDM which is the principal instrument for catalyzing mitigation in developing countries, even though according to a 2010 World Development Report, it has grown beyond initial expectations, as a result demonstrating the ability of markets to stimulate emission reductions, provide essential learning, raise awareness, and build capacity, it contains some inherent inefficiencies, raising questions about the overall process and its efficiency as a financing instrument.

[2404] See, UNFCCC, "Compilation and synthesis of fourth national communications: Addendum - Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the

study has identified the devotion of close to 10% of the total costs of adaptation to address climate change assuming that the top end of adaptation costs, should be destined for the agricultural sector in developing countries.[2405] However, the study has concluded that both in terms of the total proportion of climate change funds devoted for adaptation and in terms of the destination of the funds - country, sector, and project - the climate change funds have remained largely unclear.[2406] This is notwithstanding the fact that developing countries retain a 70% potential for carbon abatement[2407] as well as mitigation measures that are to be undertaken in order to avoid the irreversible rate[2408] of climate change.[2409] The figures for the period 2013-2014 have shown an improvement from the rate discussed above both interms of real increase in finance as well as increase in reporting coverage.[2410] This is considering the aggregate volume of both public and private climate finance which has been mobilised by developed countries for developing countries having reached 61.8 billion in 2014, up from USD 52.2 billion in 2013 USD, with an average for the two years of USD 57.0 billion per year in 2013-14.[2411] A recent study[2412] into climate finances, has, however, confirmed that no major improvements have ensued when it comes to the geographic destination of the climate finances. Accordingly, the study has divulged that in relation to the geographic destination of the climate finance for the period 2015-2016, close to 79% of the funds resided within the country of origin especially for middle and high-income countries rather than developing countries that need the funding the most.[2413] This said, during this period, an estimated 12% (48 billion USD/year) of total financial flows went to non-OECD compared to the level during 2013-2014.[2414] The same study[2415] has further disclosed that positive development

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Convention by Parties included in Annex I to the Convention", FCCC/SBI/2007/INF.6/Add.2, 19 November 2007.

[2405] UNFCCC, Investment and Financial Flows to Address Climate Change, (United Nations Framework Convention on Climate Change Secretariat, Bonn: (2007).

[2406] Ibid.

[2407] The study has moreover revealed that developing countries have close to 90% of carbon abatement potential. The carbon abatement strategy is inclusive of: energy efficiency, terrestrial carbon, and low carbon energy supply. Around 30 percent of the total GHG abatement opportunities identified fall within the terrestrial carbon category. This relates to both forestry and the agricultural sector and includes: halting deforestation, reforesting marginal areas of land, and sequestering more 'carbon' (or 'carbon equivalent', CO2e) in soils by changing agricultural practices. See, McKinsey and Company, Pathways to a Low-Carbon Economy, Version 2 of the Global Greenhouse Gas Abatement Cost Curve (2009a).

[2408] Irreversible rate of climate change connotes an increase in temperature of not more than 2o C compared to pre-industrial levels.

[2409] McKinsey and Company, Pathways to a Low-Carbon Economy, Version 2 of the Global Greenhouse Gas Abatement Cost Curve. Irreversible rate of climate change connotes an increase in temperature of not more than 2^0c compared to pre-industrial levels.

[2410] OECD, "Climate finance in 2013-14 and the USD 100 billion goal", *A Report by the Organisation for Economic Co-operation and Development (OECD) in collaboration with Climate Policy Initiative (CPI)*, (2015), According to the study, based on the data available, " the intellectual property regimes in Brazil and China, which some may consider to be less stringent than those of other developed countries, do not significantly deter companies in source countries from transferring their technologies". "The average estimate for 2013-14 comprises USD 40.7 billion of public finance (71% of the total), USD 1.6 billion of finance associated with export credits (3%), and an estimated USD 14.7 billion of mobilised private finance per year (26%)".

[2411] Ibid.

[2412] Barbara K. Buchner et al., Global Landscape of Climate Finance, Climate Policy Initiative, (2017).

[2413] Ibid.

[2414] Non-OECD countries are not just recipients of international financial flows. The study tracked $3 billion/year on average of climate finance flowing from non-OECD to OECD countries and $8 billion of flow between different developing countries. See, Buchner et al., Global Landscape of Climate Finance.

have been observable. Specifically, in this regard, as of 2015, climate financial flows reached a record high level of $437 billion dollars.[2416] The data for the year 2016 has nevertheless observed a 12% drop in climate finance to $383 billion - even though the rate is still higher when compared to the flows in 2012 and 2013.[2417] Hence, when compared to 2012-2013, the period saw a reduction in climate finance by Annex II countries.

Moreover, according to a report prepared by the South Center[2418], when it comes to developed countries obligation to provide "new and additional" financial resources to cover the "agreed full incremental costs" to assist the implementation by developing countries of their UNFCCC commitments pursuant to Article 4(1), there remains lack of clarity to ascertain compliance based on their national communication. The underlying factor for this uncertainty is due to the difficulty encountered to obtain comparable data from the State Parties concerned.[2419] This has further made the possibility to examine compliance more difficult.

Additionally, the financial resources as devoted to adaptation remain lower than those directed to mitigation.[2420] More specifically, according to a study by the UNFCCC[2421], for mitigation, a global investment of 200-210 billion USD is needed by the year 2030 so as to return global emissions to their current levels while in relation to adaptation, close to 30-50 billion USD is required in financial investment. However, the estimated financial capability is beyond what is currently available under the UNFCCC and its Kyoto Protocol.[2422] In this context, the above-discussed study into climate finance[2423] has disclosed that not much progress has been made for the period 2015-2016 as the finance devoted for adaptation[2424] has further declined from 18% to 16% in terms of public financial flows as a result of the

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[2415] Ibid.

[2416] Ibid. The record in 2015 was driven by a surge in private renewable investments, particularly in China, and in rooftop solar power in the U.S. and Japan.

[2417] Ibid. The decrease in 2016 was due to a combination of both falling technology costs and lower capacity additions in some countries. Technology costs decreased an average of 10% between 2015 and 2016, with particular decreases from solar.

[2418] Margreet & Yu III, Addressing Climate Change Through Sustainable Development and the Promotion Human Rights, 22ff. As an intergovernmental organization of developing countries established on July 31, 1995, the South Centre has the aim of helping developing countries to promote their common interests in the international arena.

[2419] Ibid.

[2420] Ibid. Developed countries' mitigation-related bilateral financing increased from US$13.05 billion during the period 1997-2000 to US$285.04 billion for the period 2001-2004, while their financing for adaptation fell from US$7 billion in 1997- 2000 to US$362.1 million in 2001-2004. This is due in large part to a massive increase in reported bilateral financing for mitigation by the United States from US$2.42 billion for 1997-2000 to US$276.684 billion for 2001-2004.

[2421] UNFCCC, 'Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate international response to climate change', (2007).

[2422] For more, see, Cottier et al., International trade Regulations and the Mitigation of Climate Change, 17-18.

[2423] Buchner et al., Global Landscape of Climate Finance.

[2424] The World Bank has recently unveiled that it has committed $200 billion in climate action investment for 2021-25, accounting for a twice of its current five-year funding. Moreover, the Bank has stated that even though much of the climate financing is being set aside for reducing greenhouse gas emissions, that a key priority is increasing support for climate adaptation especially considering the millions of people already battling the adverse effects of extreme weather. See, World Bank Doubles Funding to $200 Billion to Fight Climate Change, Agence France-Presse, Last Updated, (December 03/12/2018). Available at, https://www.ndtv.com/world-news/world-bank-promises-200-billion-in-climate-action-investment-for-2021-25-1956812?fbclid=IwAR0AKR-8X7cs8tbNvgUz9gN84yQaG_UdGLmbS3UfKVlyIEcbaZt3neZu9gY Accessed on, 05/12/2018.

reduction in national Development Finance Institutions (DFI) flows.[2425] The study as such divulged that financial flows to support adaptation measures are still lagging behind. This underlines that at a period when predictions about climate change scenarios are rather pessimistic, and considering historic GHG emissions, global temperature would continue to increase[2426], the reduction in adaptation finance is problematic. Notwithstanding this decline in adaptation finance, however, mitigation activities accounted for an average of 93% of climate finance for the period 2015 and 2016 where 74% of the financial investment was devoted for renewable energy generation.[2427] The UN Climate Secretariat has reiterated this development by noting the fact that notwithstanding increases in global climate finance flows[2428] - mainly directed towards efforts to curb GHG[2429] - a relatively small proportion of the finance has gone towards efforts to enable the most vulnerable to adapt. As such, until 2017, climate funding for mitigation has seen a rise when it comes to the devotion of financial flows while the situation remains discouraging for climate adaptation financial flows that have witnessed a decline.

Another complicating factor for clearly counting the contribution of developed countries for technology transfer and financial assistance has to do with the risk of double-counting.[2430] This is so because contributions by developed countries in relation to capacity building, for instance, are often counted as financial contribution as a result making the funds subject to double-counting. In line with this, the transfer of soft technologies, *inter alia*, information sharing or technical demonstrations, presents difficulty because it is hard to place a monetary value on them.[2431] Similarly, even though the 'flexibility mechanisms' under the Kyoto

[2425] Of the adaptation sectors, water and wastewater management captured 51% of public finance, on average, during 2015/2016, which was down from 57% in 2013/2014. Moreover, land use adaptation in the form of agriculture and forest management has increased from 11% in 2013/2014 to 19% of adaptation finance. See, et al., Global Landscape of Climate Finance.

[2426] See, ICTSD-IPC Platform on Climate Change, Agriculture and Trade: Considerations for Policymakers October ICTSD-IPC Platform on Climate Change, Agriculture and Trade, (ICTSD and FAO, 2009).

[2427] Buchner et al., Global Landscape of Climate Finance. Interestingly, for both 2015 and 2016, private investment in renewable electricity generation exceeded new fossil-fuel power generation investment by over 100%.

[2428] The 2018 biennial assessment and overview of climate finance flows of the Standing Committee on Finance, has indicated that on a comparable basis, the global climate finance flows increased by 17 per cent in 2015-16 from 2013-14 levels. See, Global climate finance flows increased, says United Nations Climate Change, TimesNowNews.com November 25/2018, Accessed on 29/11/2018, Available at, https://www.timesnownews.com/international/article/brexit-deal-the-end-of-a-loveless-46-year-marriage/320527

[2429] A latest report by the United Nations Environmental Program (UNEP) that analyzed the impact of countries' emissions cut targets/policies, has revealed that global greenhouse gas emissions in 2030 could be between 13 billion and 15 billion tones more than the level needed to keep global warming within 2 degrees Celsius this century. In this regard, the report has unveiled that annual greenhouse gas emissions reached a record high of 53.5 billion tonnes in 2017 after three years of decreases being more than the level needed to keep global warming within 2 degrees Celsius, Rate Felix, , Greenhouse Emission Gap Wider than ever, Reuters; U.N. Report, Published on, November 27/ 2018, Accessed on 29/11/2018, Available on, https://www.reuters.com/article/us-climate-change-emissions idUSKCN1NW1MQ?fbclid=IwAR1pmyIaRKSbajJJMDEWavZYM7zkhbU7g5VvcwOYwmUqKabb4VNHfvZKvv4

[2430] Wewerinke & Yu III, Addressing Climate Change Through Sustainable Development and the Promotion Human Rights, 22ff.; See also, OECD, "Climate finance in 2013-14 and the USD 100 billion goal", A Report by the Organisation for Economic Co-operation and Development (OECD) in collaboration with Climate Policy Initiative (CPI), *(2015).*

[2431] Ibid.

Protocol have a significant capacity to draw the involvement of the private sector in the transfer of EST, the compliance by developed countries of their obligations to 'take all practicable steps' as required by Article 4(5) of the Framework Agreement and Article 11(c) of the Kyoto Protocol, remains uncertain.[2432] As such, these factors have made it difficult for ascertaining compliance by Annex II countries of their obligation to transfer EST.[2433]

Additionally, access to EST to developing countries has been restrained due to IPRs protection, notably Patents. In this regard, similar to chapter four of this research, ESTs are reserves of developed countries as well as their companies. More specifically, Patents held by Western countries (notably, the EU, U.S.)[2434] continue to put a hurdle on developing countries from having access to EST.[2435] This connotes that making use of exclusive rights they are grant under the TRIPs Agreement[2436], these companies have put a hurdle on the right of everyone to benefit from results of scientific progress, including the accessibility to the scientific knowledge, the scientific applications, and technologies.[2437] As such, keeping in line with the trend in the seed sector, developed countries dominate the share of environment-related technologies. For example, as of 2005, the EU countries held a 36.7% of Patents linked to renewable energy, with the U.S. holding 20.2% and Japan 19.8%, while China held 2.9% and Korea 2.3%.[2438] While the top position for EST is held by developed countries (OECD, MS)[2439], leading emerging countries such as China, Brazil, and India, do not even hold a top-10 position in the development of EST although recent trends have shown some improvements.[2440] This shows that the speed, as well as diffusion of EST in the next decade,

[2432] Cottier et al., International Trade Regulations and the Mitigation of Climate Change.

[2433] Bali Action Plan, 2007, Available at, http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf, Accessed on 2/10/2018. In 2007, the Bali Action Plan was adopted which specified the nature of the technological support that should ensue from developed countries to developing countries in a measurable, reportable and verifiable manner.

[2434] Organization for Economic Co-operation and Development (OECD), Compendium of Patent Statistics (2008).

[2435] For an alternative view about the role of IPRs in EST, see, Pugatch M. Perez, The Role of Intellectual Property Rights in the Transfer of Environmentally Sound Technologies. Global Challenges Report, WIPO: Geneva (2011) . www.wipo.int/globalchallenges

[2436] See, The Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 28.

[2437] See, Report of the Special Rapporteur in the field of cultural rights on the right to enjoy the benefits of scientific progress and its applications, presented at the Twentieth Session of the Human Rights Council (14 May 2012) (A/ HRC/20/26): Paragraph 26.; Meir Perez Pugatch, Perez Pugatch, M. The Role of Intellectual Property Rights in the Transfer of Environmentally Sound Technologies. Global Challenges Report, WIPO: Geneva (2011), www.wipo.int/globalchallenges.

[2438] Organization for Economic Co-operation and Development (OECD), Compendium of Patent Statistics.

[2439] Bernice Lee et al., Who Owns Our Low Carbon Future? Intellectual Property and Energy Technologies, A Chatham House Report, (2009). This study examined patent ownership of six energy technologies (wind, solar, photovoltaic, concentrated solar power, biomass-to-electricity, cleaner coal and carbon capture) and found that the US, Japan and Germany are clear leaders in energy innovations.

[2440] According to a recent report into Energy Transition in the World's Fastest Growing Economies, fuelled by surging electricity demand and sinking technology costs, the prospects for developing nations have become optimistic as they have come to lead the global clean power transition. In this regard, according to this report by energy researcher BloombergNEF, Chile and India have scored first and second in the production of renewable energy in 2017. See, Emerging Markets Outlook, Energy Transition in the World's Fastest Growing Economies, (Climate Scope 2018), see also, Maria Thomas, World Economic Forum, India is Now a Leader in Renewable Energy, Here's How, Published on (30/11/2018). Available at, https://www.weforum.org/agenda/2018/11/india-is-now-a-world-leader-in-renewableenergy/?fbclid=IwAR3diN7NUJyV9K56YNRQCUnWMznBJj-zO0ci07QAVBGr0RU0HJGFRQsjv7U Accessed on 05/12/2018.

will to a considerable degree be determined by private companies found in developed countries.[2441]

Moreover, as noted in chapter four, the agribusiness companies that specialize in the production of environmentally sustainable fertilizers, as well as pesticides, for example, have come to dominate the agricultural sector. These companies have filed numerous Patent applications on the genes for their "climate-friendly" crops.[2442] These crops have been genetically improved to endure extreme weather conditions (environmental stress) such as drought, heat, cold and floods.[2443] However, the growth in scope, as well as a number of Patent applications, risk over empowering these agribusiness MNCs into a dominant position such that they come to monopolize over genes, crops, and seeds.[2444] The expansion of Patent claims on ESTs threatens the right to enjoy the benefits of scientific progress because it reneges on the physical availability and economic affordability of EST.[2445]

As can be inferred, the above-discussed provisions of the UNFCCC in relation to the transfer of EST requires the developed country State Parties to assist developing countries in meeting their commitments.[2446] Notwithstanding this obligation, the recent growth in the share of the private sector's hold on agricultural technology development and its dissemination (including EST), although has brought new opportunities, has at the same time opened the Pandora box by changing the terms under which these ESTs are accessed.[2447] Specifically, in the environmental technology field, Patent application for most renewable energy technologies especially techniques for controlling automobile emissions have been on a rise since the mid-1990s.[2448] Even though this increase has taken place in most countries, it has especially seen a rise in the EU and Japan.[2449] This is due to the fact that, as connoted above, rather than allowing developing countries to have access to EST, Patent protection by extending the scope of application, has allowed agribusiness MNCs to have exclusive rights over genetic

[2441] Organization for Economic Co-operation and Development (OECD), Compendium of Patent Statistics.
[2442] Just six gene-related companies and their two biotech partners control 201 or 77% of the 261 patent families referred to. See, ETC Group, Capturing Climate Genes, (2010).
[2443] See, Khor, "Climate Change, Technology and Intellectual Property Rights," 14-15.
[2444] See, ETC Group, Capturing Climate Genes. The ETC group has raised concern that this would restrict the access to germplasm and to seeds, and has called for a review of the social and environmental implications of these new varieties, and a review also of IPR laws regarding approval of "climate-related genes".
[2445] See, Report of the Special Rapporteur in the field of cultural rights on the right to enjoy the benefits of scientific progress and its applications, presented at the Twentieth Session of the Human Rights Council (14 May 2012) (A/ HRC/20/26): Paragraph 30.
[2446] See, for example, UNFCCC, Article 4(3).
[2447] FAO, The State of Food and Agriculture: Climate Change, Agriculture and Food Security; UNFCCC, "Application of Environmentally Sound Technologies for Adaptation to Climate Change," technical paper FCCC/TP/2006/2, (2006): 82-84. Even though the transfer of EST under the UNFCCC has so far been insufficient, there were attempts to rectify the implementation gap. For instance, the COP has set up the Expert Group on Technology Transfer which has a mandate to advance "the development, deployment, adoption, diffusion, and transfer of environmentally sound technologies to developing countries, taking into consideration differences in accessing and applying technologies for mitigation and adaptation". Moreover, the Bali Action Plan was adopted under which it was agreed that that developed countries would provide technology support to developing countries in a measurable, reportable and verifiable manner.
[2448] See, Compendium of Patent Statistics, (OECD, 2008).
[2449] Ibid.

resources, plant varieties, as well as living organisms to the determinant of denying access to the public (developing countries) to have access to EST.[2450]

The impediment of strict Patent protection in agricultural on the accessibility of EST has the effect of demoting the possibility of conducting new research and development by locals living in developing countries for instance.[2451] This is due to the fact that the more Patents are held by foreign MNCs, it puts restrictions on local R&D as the exclusive right granted to the Patent holder gives him/her the power to exclude third parties[2452] - developing countries in this vein - from using, the technology, in this regard EST. Moreover, as can be recalled, the exclusive right[2453] bestowed upon a Patent holder makes it more difficult for researchers in developing countries neither to develop nor make use of the patented technology in contravention of the obligation enshrined in the UNFCCC that requires Annex II parties to support the development of endogenous capability and technologies of developing countries.[2454] Additionally, in the scenario that a local firm from a developing country vows to make use of a patented EST, it will be required to pay a large sum of money as royalty fee.[2455]As a result, a local firm will be outcompeted and outstripped due to the high fee requirements which many local firms are unable to pay. This is because the TRIPS Agreement has granted the technology owner the right to charge a higher price for a technology - EST.[2456] Parallel to this, the requirement for the payment of expensive royalty by developing countries so as to access the EST can have the effect of draining national capability as well as foreign currency reserves. For countries facing balance-of-payments constraints, for instance, this may be an acute problem.[2457] For developing countries as a whole an estimation of royalty payments has increased from $6.8 billion in 1995 to $50.6 billion in 2009.[2458] A 2009 study by the South Center similarly showed the fact that since most EST are owned by foreign companies, they constrain the ability of developing countries from having affordable and meaningful access to them.[2459] As a consequence of this, the right of everyone to have access to the benefits of science is restrained especially in relation to the physical availability and economic affordability of benefits on a non-discrimination basis.[2460]

Moreover, in order to maintain their dominant position, IP holders generally and in EST specifically, resort to legal suits to preserve their market monopoly. They do so by putting

[2450] See, Shulman S., "Patent Absurdities," The Sciences, (1999); Francesco Francioni, Environment, Human Rights, and International Trade, (Hart Publishing Oxford and Portland, Oregon, 2009): 160ff.
[2451] See, Khor, "Climate Change, Technology and Intellectual Property Rights," 14-15.
[2452] See, Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 28.
[2453] Ibid.
[2454] See, UNFCCC, Article 4(5).
[2455] See, Agreement on Trade-Related Aspects of Intellectual Property Rights, (15 April 1994): Article 31(h).
[2456] Ibid; Khor, "Climate Change, Technology and Intellectual Property Rights," 14-15.
[2457] Khor, "Climate Change, Technology and Intellectual Property Rights," 14-15.
[2458] For instance, according to the International Monetary Fund (IMF), balance-of-payments data for India, net royalties and license fees paid in 2010 totaled $2,309 million compared to $325 million in 2002 and $997 million in 2007.
[2459] The South Centre, Accelerating climate-relevant technology innovation and transfer to developing countries: Using TRIPS flexibilities under the UNFCCC, Analytical Note, (2009).
[2460] See, Report of the Special Rapporteur in the field of cultural rights on the right to enjoy the benefits of scientific progress and its applications, presented at the Twentieth Session of the Human Rights Council (14 May 2012) (A/ HRC/20/26).

themselves in such a position that will enable them to extract significant royalties from the party that intends to use or has used a technology.[2461] Therefore, the resort to such "opportunistic & anti-competitive lawsuits" risk hampering access to climate technologies to developing countries in contravention to the right of everyone to enjoy the benefits of scientific progress.[2462] The effect of this trend of litigation on developing countries in the future is that Patent litigation or even the threat of litigation may constrain developing country firms from investing in mitigation and adaptation technologies, albeit the potential vested in the agricultural sector of developing countries.[2463] Such lawsuits additionally slow down on the timely diffusion of such technologies.[2464] It can, therefore, be deduced that due to the above-discussed developments, the right of everyone, developing countries in this vein, to enjoy benefit from results of scientific innovations, such as EST, as provided under Article 15(1) (b) of the ICESCR[2465], is being hindered.

[2461] Sangeeta Shashikant, IPRs and technology transfer Issues in the Context of Climate Change, (2010): Paragraph 30.
[2462] See, UN Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999).
[2463] See, FAO, Climate change and food security: A Framework Document. Summary, (FAO Rome, 2007).
[2464] Martin Khor, Climate Change, Technology and Intellectual Property Rights: Context and Recent Negotiations, Research Paper 45, (South Center, Switzerland, 2012).
[2465] See, U.N. Committee on Economic, Social and Cultural Rights, General Comment No. 12 (1999), The right to adequate food (art. 11), U.N. doc. E/C.12/1999/5: Article 15(1) (b).

CHAPTER 6: Conclusions and Recommendation

This research has attempted to scrutinize the underlying factors that have derailed the full enjoyment of the right to food. Cognizant of the fact that global hunger and food insecurity are currently on the rise emanating from natural as well as man-made calamities such as climate change, it has attempted to uncover the exacerbating factors that lie beneath. In this regard, even though the full realization of the right to food, as explored under chapter two of the research, is to be achieved progressively, the minimum core for the realization of the same, i.e., the freedom from hunger, is to be attained immediately as it requires the taking of more immediate and urgent steps by the State Parties. In this regard, the State Parties to the ICESCR have assumed obligations to respect, protect and fulfill the right to food so as to ensure its gradual realization. In spite of this due recognition the State Parties have given to the right to adequate food via incorporation into domestic laws, for instance, a close inspection would reveal that the progress towards its realization is lagging behind.

With this due recognition in mind, the research has investigated the underlying reasons behind. Accordingly, as discussed under chapters three, four and five, the findings have concurred that among other factors that can be cited, the manner in which international agricultural trade is being conducted, the expansion in scope and number of IPRs protection in plant-related innovations as well as human-induced causes of climate change, such as that caused by industrial agriculture, have impaired the capacity of State Parties to effectively execute their duties to respect, protect and fulfill the right to adequate food towards the public.

In addition to this, as explored further under chapter two, the research has attested that the above-noted lag as regards the realization of the right to food has additionally been hastened due to the manner in which the results of scientific innovations/advancements are conceived. This relates to the second salient theme of the research, the right to science, which is incorporated in international human right instruments. This is because while being enshrined in international human rights instruments, notably the UDHR and ICESCR, up until now, the right to science has not received clarification as regards its core contents, and ensuing duties it imposes on the State Parties to ICESCR. In spite of the prevailing lack of clarity, however, there can be witnessed a tendency to consider scientific innovations in and of themselves as a panacea to ensure the realization of human rights in general and the right to adequate food more specifically. Building on scholarly contributions that have attempted to clarify the constituent elements of the right to science and in an attempt to gear the engine towards its clarity, the research has attested that at the outset, the right to science besides its value for realization of other human rights, needs to be conceived as a right in and of itself.

Thus, by focusing on the right to adequate food as a case in point to demonstrate this one-sided assumption, the research has tried to show how the lack of proper understanding regarding the nature of the relationship that should exist between the right to science and the right to food has resulted is reneging the realization of the latter. In this regard, the results have confirmed that there is a tendency to approach the right to food and that of scientific

advancements as mutually supportive in that to the extent that there is scientific progress, to see this as a ready-made solution for averting the problem of food insecurity.

Notwithstanding this long-held assumption, the research has confirmed that even though scientific progress has contributed and still continues to support food production, the manner in which the relationship has been constructed thus far may need to be modified. As illustrative cases in point to demonstrate this one-sided assumption, the research has examined three areas wherein the upshots of this conceptualization have been most vivid. As examined respectively under chapters three, four and five, this tendency - to view science as a sole remedy to addressing concerns related to food security - has led to a derailment on the realization of the right to adequate food.

With the aim to uncovering the underlying reasons behind this, the research has examined firstly (under chapter three) the restrictions that ensue from the rules which guide the conduct of international trade. In finding an answer to the research question, does international trade restrain the realization of the right to food and how has this has taken place?, the research has examined the AOA. Accordingly, the results have demonstrated that the underlying rules through which the agreement is guided by is one-sided in that the rules have been formulated to be in line with the interests of developed country Member States.

Moreover, the results have illustrated that the rules that guide international trade in agriculture, have left developing county State Parties in a disadvantageous position to equitably benefit from international trade as a consequence restraining their ability to ensure the realization of the right to food. More specifically, developed country MS have been able to use loopholes found in the AOA so as to ensure their interests. This implies that contrary to the obligations they have assumed under the AOA (tarrification with the intention to increase market access, reduction in export subsidies, and domestic support provision), they have employed their obligations strategically (for instance via the means of dirty tariffication, selective tariff reduction, tariff escalation) so as to ensure their interests. These practices have incapacitated developing country State Parties from ensuring the realization of the right to food towards the public and have made them to be dependent on food imports. This is because these developments have directly impinged on the right to food of agricultural producers in developing countries. The consequence has moreover opened developing countries to the arrival of cheap subsidized agricultural commodities against which local producers are unable to compete in order to ensure local food provision. This connotes that agricultural producers get low income for their commodities which restrains their "economic accessibility" to be able to afford the food which arrives on the market. This phenomenon furthermore violates the availability dimension of the right to food as it has restricted the ability of producers in developing countries to feed themselves while at the same time limiting their ability to make ends meet by selling their commodities locally. Furthermore, the rules have restrained States' policy space as needed to raise domestic revenue and to prop-up the agricultural sector because developing countries are unable to utilize these measures as necessary so as to equitably benefit from agricultural trade. Therefore, the AOA has institutionalized already existing inequalities.

In finding an answer to the research question posed above, the research has also investigated how the manner in which the transfer of technology is being carried out in international trade transactions - specifically related to technical and scientific innovations in the agricultural sector - has not given due recognition to the right to science. In this respect, even though trade is expected to be an avenue for the ITOT, the rules that are operational in this regard - AOA - have not given due recognition to the ITOT from developed to developing countries. This has been because firstly, the provision of financial and technical assistance - although made an integral part of the Marrakesh Decision - has not been implemented effectively. Secondly, agribusiness MNC's at different levels, have been exerting immense influence - through government lobbying for instance - so as to guarantee the rules are to their liking and their benefits are ensured in the trade transactions. Thus, rather than enhancing the participation of developing countries in world production, the manner in which the ITOT is currently being conducted has further restrained the participation of developing countries.

The research has examined secondly (under chapter four), the concerns being raised in relation to the restrictions that emanate from the growth and expansion of IPRs protection - specifically that of Patent protection in plant-related innovations. By using the TRIPS agreement and the UPOV Convention as interpretive tools, the following research question was posed, Is the realization of the right to food being hampered by the international IPRs regime and how has this transpired? By making use of the TRIPS provisions in general and those related to the protection of plant varieties (specifically Article 27(3)(b)), the research has scrutinized the tension which currently exists between IPRs protection being granted to agribusiness MNCs (mainly in the seed sector) and the right to food. The research has also inspected the UPOV Convention as an alternative way of plant variety protection. Accordingly, the research has examined how the exclusive rights protection regime under both systems of protection, has curtailed on States' ability to progressively realize the right to food and as a consequence has reneged on the accessibility of scientific results (such as Genetically improved seeds) to the public.

In this respect, the results have confirmed that the proliferation of IPRs protection in plants has put restrictions on the State's ability to realize the right to food. This is because the exclusive right regime grants exclusive rights to Patent holders (agribusiness MNC's) which specialize in plant-related innovations. As an illustrative case in point, the current strengthening of Patent claims in plants has put major restrictions on farmers' seed system - wherein seed saving, re-use and exchange are most common - through which farmers have been able to develop better seed varieties for a long time. Moreover, such traditional practices have been instrumental in cutting down the costs farmers would incur in buying new seeds varieties each season from the formal market.

The results have, however, concurred that the exclusive rights granted to Patent holders that have made improvements in plants has restrained the ability of farmers to access the protected invention because the terms of protection warrants the Patent holder (agribusiness MNC) the right to exclude third parties (in this context, farmers) from the acts of "making, using, offering for sale, selling, or importing" the product as well as the process which is so

protected. This has incapacitated farmers from being able to utilize the protected plant-related invention (such as GM seeds) so as to make improvements. The exclusive right regime has at the same time forced farmers to discontinue their traditional practices of seed saving, re-use, and exchange which are conceived to be infringements as per the terms of protection.

Thus, the infiltration of Patent holders into the traditional practices common in most farming societies has put a hurdle on the obligation of States to ensure the availability of food as acceptable within the customary practices of farmers**.** Due to this restriction imposed, the innovative capacities of farmers to breed better and locally adapted varieties has been curtailed upon. Hence, in this scenario where farmers have been forced to do away with such traditional practices, they are required to get either an authorization from the Patent holder for carrying out such activities or absent such permission they have to pay the expensive price charged so as to access the GE seeds. This reneges on the right to food - economic accessibility - of farmers that need access to seeds for their daily subsistence as well as to make improvements in plants as they would be asked to discontinue their customary practices of seed saving, reuse, and exchange. As a consequence, farmers are forced to rely on the provision of expensive commercial seeds from the private sector. This threatens farmers economic independence as they are no longer in a position neither to provide seeds locally nor to their household in contravention to "economic accessibility" to ensure the right to adequate food. Thus, the findings have confirmed that farmers right to adequate food especially as regards the availability of food as acceptable within the customary practices of farmers as well accessibility in relation to the financial costs (affordability) incurred for the acquisition of adequate food in a sustainable way, has faced limitation as a result of Patent claims by agribusiness MNC's.

The chapter has additionally examined the UPOV system of PVP protection as an alternative system for the protection of new varieties of plants. The findings have however concurred that PVP protection has not provided a good alternative to Patents. This is because of the fact that when compared to Patents, the criteria for protection are less strict because plant breeders can easily obtain PVP protection for their new plant varieties as the requirement of inventive step and industrial application, which are eligibility criteria for Patent, are non-existent under the PVP system. This means that as a result of the DUS criteria for protection which are less restrictive, it has become easier for plant breeders to secure monopoly rights over their varieties which negatively affects traditional farmers varieties (landraces) which are naturally not uniform and stable. This poses a serious impediment on a State's ability to realize the right to food because the conditions for protection under UPOV threaten genetic diversity in agriculture due to the emphasis on commercially known varieties over which knowledge has already developed. Thus, by eliminating farmers' traditional varieties (which fail to meet the DUS criteria) from the scope of protection, the agro-biotechnological sector has threatened farmers' seed system which has helped farmers throughout the years to be economically independent and maintain resilience in the face of changes to climate, soil, and diseases. This poses a challenge on the economic accessibility of the right to food because farmers have been pressured to abandon their traditional varieties in place of commercial varieties which are not suited to the local agro-ecological conditions. In this regard, even though these modern seeds, which are the result of scientific progress, could be relevant, the fact that

access to these modern seeds requires farmers to pay more (less affordable) may restrict the full enjoyment of the right to food. Aside from this, PVP protection threatens the accessibility of the right to food because it has narrowed the avenue for the public to enjoy such accessibility in ways that do not interfere with the enjoyment of other human rights. As a consequence, the prioritization of uniform varieties by the agro-biological sector has undermined agricultural biodiversity and by so doing has impeded on farmers' livelihood hence constraining their ability to realize other basic human rights.

Thirdly, the research has inspected (chapter five) the concerns that emanate from climate change (with specific reference to high temperature and most intense and severe weather conditions) on the right to food. By making reference to the UNFCCC and its Kyoto Protocol as interpretative tools in order to unpack the underlying factors behind, the following research question was posed, if and how does industrial agricultural production hasten human-induced climate change occurrences as such impeding the realization of the right to food?

In this regard, the research has inspected how the adverse effects of climate change, *inter alia*, as a result of higher temperature as well as the occurrence of most intense and severe weather events, have impaired the realization of the right to food. Moreover, the research has uncovered the fact that industrial agricultural production on its part also contributes a large share of GHGs emissions as a result adversely affecting the climate. Accordingly, the manner by which industrial food production is being carried out has exacerbated adverse anthropogenic (human-induced) causes of climate change as a consequence restraining the full enjoyment of the right to food.

In finding an answer to the research question posed above, the findings have confirmed that firstly, the provisions ingrained in the UNFCCC and its Kyoto Protocol, have not been met by the State Parties effectively such that they have not resulted in much progress in addressing the threat posed by climate change. In this vein, the findings have demonstrated that the State Parties to the UNFCCC, referring to Annex II parties that have historically contributed a large percentage of GHGs, have not met their obligations. As a consequence, the results have confirmed that the adverse effects of climate change will continue to wreak havoc especially on the regions that are already the most food insecure as a result threatening the realization of the right to food.

Secondly, the results have demonstrated that the lack of effective transfer of EST by developed countries towards those most vulnerable developing countries, has at the same time, led to a restriction on the enjoyment of the right to science in two respects. More specifically the results have concurred that, as provided above, the ineffective implementation of the obligations undertaken by developed State Parties, in consideration of their historical contribution and capability, for the transfer of EST to those developing countries which are most vulnerable, has led to a restriction on the right to science. This is due to the fact that the financial flows directed for this purpose have not been sufficient. Moreover, drawing on chapter four of the research, IPRs protection granted for companies that specialize in EST

found in Annex I countries, has further restrained the accessibility of scientific progress to developing countries.

Therefore, the research has demonstrated that the State Parties to the ICESCR have faced limitations in their efforts to progressively realize the right to adequate food (by respecting, protecting and fulfilling their obligations) because of, 1. the strategic implementation of the obligations assumed by developed countries in relation to international agricultural trade, 2. the expansion of IPRs protection in plant-related innovations (seeds), 3. the modalities of industrial food production which is a large driver of human-induced causes of climate change. Additionally, the fact that scientific advancements are considered a panacea for addressing the problems of food insecurity, without however acknowledging the kinds and form of scientific progress that should be promoted, has contributed a fair share for the slow progress witnessed thus far. Based on this conclusion, the following recommendations are provided.

- Developing country MS to the TRIPS Agreement should use effectively the TRIPS flexibility as regards plant variety protection.

- If countries consider protection through Patent to be restrictive, they should design an appropriate *sui generis* system which takes into context national priorities provided that it is "effective". Thus in adopting an effective *sui generis* system of protection, developing country MS should ensure that the plant variety protection suits their specific needs.

- The *sui generis* form of protection to be adopted should also give recognition to their international obligations such as human right instruments, and commitments undertaken in environmental treaties.

- Such an alternative system should give due recognition to farmers' rights as well as farmers' seed systems.

- Participation in BITs and MITS should not be made conditional on the adoption of the UPOV 1991 Act.

- Developed countries should effectively implement their obligations under the AOA.

- Developed countries should not discourage local food production by dumping cheap agricultural goods into the market.

- Developed countries should not implement their obligations in such a manner that developing countries are not able to enter the international market.

- In order to boost their revenues, developing countries should not be restricted from employing tarrifs, export and domestic subsidies.

- Developing countries should receive needed technical and financial assistance in order to enhance their capabilities.

- The DDR should be concluded in such a manner that pays attention to food security concerns as an integral non-trade concern,

- In view of the serious nature of the threat posed by climate change, developed countries should fulfill their obligations (UNFCCC, Kyoto Protocol and the recent Paris Climate Accord) effectively.

- With the view to help developing countries (NFIDC and LDCs) adopt effective adaptation strategies as well as to successfully implement their obligations, they should be granted needed financial means.

- Due recognition should be granted to sustainable small-scale agriculture which has a large contribution in both climate change mitigation and adaptation options while doing so whilst conserving agrobiodiversity.

- Rather than being considered as an end by itself, a human right approach to the right to science should be promoted.

- Thus any future attempt, in this respect, should approach the right to science as a human right. This implies that instead of approaching science as an end by itself, it should be approached in terms of the kinds and form of scientific progress that should be promoted.

- This inquiry should moreover encompass an assessment of access to which kinds of knowledge and technologies should be facilitated.

- Therefore, rather than the mere consideration to view scientific progress as an end in and of itself, it should be seen as an instrument.

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