

What is alternative about Alternative Agri-Food Networks? A research agenda towards an interdisciplinary assessment

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Introduction

This paper presents a research agenda about Alternative Agri-Food Networks (AFNs)¹ and an introduction to the literature from an interdisciplinary standpoint. We assume that, besides the scientific relevance of our approach, this research agenda may be effective for 'raising awareness' about AFNs among politicians, administrators and technicians and, thus, may help to better support AFNs through public policies (ROEP, WISKERKE 2012). AFNs are often viewed as desirable on social and environmental grounds. It is argued that, given the shorter distance food travels, they are more environmental friendly for society and economically cheaper for consumers. Being based on direct connections between consumers and producers, they also arguably enhance social capital by creating a local network based on trust and common definitions of quality. These arguments are attractive but they have two serious shortcomings: (i) they have an ideological flavour, as well as lack of sound theoretical framing and (ii) they are often analyzed separately. In this paper we outline a framework to directly address these shortcomings from diverse but interrelated standpoints: territorial, environmental, economic, and sociological. The territorial perspective will highlight the modalities through which agri-food networks are organised at different geographical scales and affect the territories they are linked to. The environmental analysis will urge to go beyond a simple, even if very complex to study, 'Life Cycle Assessment' to take into account the multi-functionality of farms and the territorial dimensions of the area where the supply chains is placed. The economic standpoint will outline the necessity to examine both the economic determinants of the farmers' choice to use the AFNs and the mechanisms explaining why consumers are using, from the demand side, the same chains. Finally, the sociological analysis will point to the mechanisms through which quality conventions emerge and diffuse in AFNs. Before illustrating these points, a succinct summary of AFNs will be provided.

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1. Alternative Agri-Food Networks: Re-localize Food and Enhancing quality

In the last years, AFNs have assumed an even more pivotal role in the interdisciplinary debate upon many different issues, such as rural and local development, local sustaina-

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bility, alternative economics, and so on (TREGGAR 2011; CARROL 2012). Nevertheless, a clear and thorough definition of what AFNs are and the mechanisms explaining how they work is still missing, since most of the debate has assumed a very descriptive and often ideological perspective centred on the analysis of specific local case-studies (SONNINO, MARDSEN 2006). Looking at the evolution of AFNs, the very first experiences in this field could be described in terms of radical opposition against the conventional capitalistic food industry, considered as non-sustainable from the environmental perspective, socially unequal and economically hegemonic. On the contrary, AFNs were initially conceived as niches of social innovation, based on trust, equal and fair relationships among producers and consumers and on more natural, healthy and local modes of food production. In the international debate, AFNs have been described in terms of many different properties and qualities, such as: embeddedness in regional and local food-culture, quality of food production, sustainability of the food supply chain, democracy of social and economic relations, added value for the rural territory and farmers, and so on (FEENSTRA 1997). From the empirical side, these features are recognized in a plethora of very different practices, both from the organizational dimensions, aims and intents.

Despite this diversity, AFNs may be sub-divided into three main types (MARDSEN, BANKS, BRISTOW 2000): face-to-face (consumers purchase a product direct from the producer/processor on a face to face basis); spatial proximity (products are produced and re-tailed in a specific region or place of production); spatially extended (the local value and regional identity of the product is incorporated into it and translated to consumers outside the region). Several studies (MARDSEN 2004; PARROT ET AL. 2002) have highlighted the profound differences between AFNs in the north and south of Europe. In northern European countries such as the United Kingdom, the Netherlands and Germany, the growth of AFNs "is often based on modern and more commercial quality definitions, stressing environmental sustainability or animal welfare, and on more innovative forms of marketing" (SONNINO, MARDSEN 2006, 186); in southern European countries, and in particular in Italy, food culture is based more on highly regionalised production involving many small family-run farms or agricultural holdings and a time-tested concern for quality (even if defined more in cultural than formal terms) and direct sales, either at the farm or in urban and district markets. In European countries AFNs link producers, processors and consumers through a common vision and values which go far beyond simple market production (GOSZCZYNSKI, KNIEC 2011).

2. Territory and territoriality of AFNs.

We will propose an approach based on the considerations of the territory which emerged as part of the debate in the so-called "Italian territorialist school" (MAGNAGHI 2005; DEMATTEIS, GOVERNA 2005). In these approaches, the meaning of territory is much broader and includes more than just a geographical area; territory is considered as an ensemble of complex material and immaterial relations involving the spatial dimension, the relations between actors (at all scales), and between the latter and local resources. Considered thus, the territory is in actual fact a "territorial system", a crossroads of complex social, economic, cultural and environmental relations organised in superimposed but not coincidental scales. The territory is the result of international work by the social actors who express their territoriality (RAFFESTIN 1980) - in other words the strategies used by actors to organise themselves in the territory - by

exploiting resources and entering into relations at various levels in order to achieve their strategic objectives. Raffestin's proposal involves rethinking geography solely based on the concept of territoriality, and considering it as a process sparked by several actors, from the individual to the collective, on different scales. More specifically, Raffestin defines territoriality as the ensemble of relations that humans maintain with exteriority and alterity, with the assistance of mediators, for the satisfaction of their needs, towards the end of attaining the greatest possible autonomy, that is the capacity to have aleatory relations with their physical and social environment taking into account the resources of the system (RAFFESTIN 2012, 139).

Dematteis (2007) provides a successful interpretative approach of the ensemble of relations between actors and territory that defines territoriality. These relations can be conceived on three complementary levels: (i) the spatial dimension of the relations, that is the organisation of the relations between the actors in space and the various geographical scales (from local to global); (ii) the dimension of the material and immaterial resources mobilised through the action of the actors, that is the resources present in the territory that are functional to achieving the strategic objectives of the actors; and (iii) the dimension of the social relations between the actors, that is the way in which the actors reciprocally enter into the relationship to enhance the resources of the territory and pursue their own strategic objectives. These three dimensions can be used to analyse and describe the territoriality of the different types of AFNs, considering both the functional and substantial aspects at the same time. Other researches have already begun to analyze the 'scaling up' of alternative food networks (see BECKIE, KENNEDY, WITTMAN 2012 on the cases of the western Canadian provinces of British Columbia and Alberta).

In fact, whatever the organisational form of the AFNs (VOLPENTESTA, AMMIRATO 2013), the latter necessarily have to express their own specific territoriality, which can be defined depending on the relations created with the territory as far as space, resources and relations are concerned. In this perspective, for instance, AFNs at a local scale can be easily developed by linking pen-urban farmlands and cities (PAULE, MCKENZIE, HASLAM 2013). Accordingly, the scalar organisation of AFNs need to consider both the vertical and horizontal dimension: i) how the selected AFNs are inscribed in social, economic and environmental relations at different scales (including public policies of support to AFNs); and ii) which are the nodes of the networks, where they are and the different geographical scales involved through them; which are the resources mobilised and enhanced in the selected AFNs; finally, which kind of social and economic relations the selected AFNs are built on.

3. Environmental Sustainability of AFN: Territorial Analysis, Agri-Food Chains and Multifunctionality

Over the past 10 years in all European countries a new role of agriculture and new 'social contracts' for producers, which are directed towards sustainable agricultural development, has been debated. In this context new alternative functions to the traditional agriculture production are designed for the farming: (i) an economic function, both for production of goods and services and for jobs creation in rural spaces; (ii) a social function for the management of the territory, the improvement of vitality of the rural life and the transmission of a specific cultural heritage; (iii) an ecologic function of environmental protection and landscape maintenance.

In this context the issue of evaluation of the environmental sustainability of farming systems is more relevant than ever. From the environmental viewpoint, a farming activity is sustainable if its polluting emissions and its use of natural resources can be supported in the long term by the natural environment. Diagnosis of the environmental impact of agriculture therefore is a crucial step in the overall assessment of the sustainability of agriculture. Life Cycle Assessment (LCA) is widely used in all categories and sectors to assess the environmental impact of production and supply chains (VAN DER WERF, PETIT 2002). Different softwares can be used to quantify the environmental impacts of processes using various impact categories such as CO₂ emissions, non-renewable energy, global warming potential. Using these tools does not go without problems, especially when dealing with complex and articulated value chains. Actually this kind of analysis separates the value chains from the surrounding environment, not considering the multifunctionality or the diversity of the production and consumption analyzed. To include these dimensions, we need to analyze the environmental impact not of a single commodity but of a *complex commodity chain* 'from the farm to the fork'. AFNs provide the opportunity to assess the environmental impact from this innovative perspective, especially including the consumers behaviour and its environmental impact. Consumers' behaviour is key since people have the tendency to behave differently according to the ethical sides and selfless motivations (CEMBALO, MIGLIORE, SCHIFANI 2012), as well as to pursue different styles of ecological engagement (MORRIS, KIRWAN 2011).

In this respect, some key points apply specifically for the territorial system assessment of the environmental impacts of agriculture as: (i) methods which allow the expression of impacts according to several reference units are preferable, as they allow the different functions of agriculture at the regional scale, e.g. production of commodities versus non-market functions, to be evaluated; (ii) methods of extrapolation or scaling procedures have to be defined to apply indicators developed at the farm level to the regional level in terms of classification of farms, vulnerability of the environment, or fate of pollutants, according to the available data at the regional scale.

Finally, a system approach to the environmental evaluation of a farming system should integrate into the assessment both inputs and outputs at the territorial level as well as the possible effects of interactions between farms. Consideration of these interactions is absent in many existing methods and thus constitutes a challenge for new methods of territorial evaluation.

4. Economic Analysis of AFN: Producers and Consumers Choices

Are AFNs economically sustainable? Can they survive and last in time? This is strictly linked to the profitability of this exchange systems – for producers – and to the cost borne, and to the utility gained, for consumers. While a substantial literature exists concerning the AFNs, especially in the sociological and geographical field, it is rather scarce as to the economic approach. There is some literature on farmers' choice of alternative marketing choices. Some work concerns the choice of sale mechanism, like forward contracts vs. cash sale (FLETCHER, TERZA 1986; FU ET AL. 1988; McLEAY, ZWART 1988) in developed countries. Research concerning developing countries focuses on farm households' choices to sell or to buy (GOETZ 1992; KEY, SADOULET, DE JANVRY 2000). Faf-champs and Vargas Hill (2005) examine the choice of coffee producers to sell at the farmgate or to travel to the market. Finally, Corsi *et al.* (2009) assess the determinants

of the choice of traditional vs. alternative marketing chains among organic producers. A gap to be filled therefore concerns the economic determinants of the farmers' choice to use the AFNs, and at the same time the determinants of the consumers in using, from the demand side, the same chains.

There are different types of AFNs, but they share the characteristic of using chains different from the traditional ones. The benefits from the AFN for producers are often higher received prices and/or, a higher security of sales; for consumers, they may be lower purchase prices, but also a higher utility, stemming from presumably safer and better tasting food, but also on participation in the network. Nevertheless, the often disregarded implication is that the chain costs – what is needed to transfer food from the producer to the consumer – are no more borne by the traditional operators, but directly by consumers and/or producers. The fact that a large part of these costs (namely labour costs) are implicit and are therefore not considered by the involved operators, often obscures this issue for the participants. Nevertheless, on the long term benefits greater than costs are a necessary condition for the survival of the system.

From the producers' side, both the benefits and the costs associated with using the AFNs should be measured: both price premium from AFNs and the risk associated with the AFNs relative to the traditional chain need to be assessed. The analysis of the costs should include both monetary costs (transport, selling facilities, etc.) and labour costs. Since AFNs activities are labour-intensive, a particular emphasis has to be given to considerations on the opportunity cost of family labour. It should be noted that labour devoted to direct selling might imply a positive utility, due to social interaction, and thus reduce the subjective cost of labour. Subjective motivations for this activity need to be investigated accordingly.

From the consumers' side, the costs associated with the use of the AFNs also include monetary costs and labour costs. In the case of consumers, the gains are to be assessed again in terms of monetary benefits and costs, but also in terms of higher utility attached to consumption of the AFNs food. Non-pecuniary benefits attached to some money expenditure are a familiar issue in the environmental valuation literature, and the 'purchase of moral satisfaction' or the 'warm glow effect' are well known and investigated phenomena in that field. It is quite plausible that similar effects are at work, e.g., for participants in community supported agriculture programs or similar chains. By the same token, labour provided by consumers for the functioning of the AFNs is not necessarily a cost, since a positive utility can be attached to it when provided as volunteer for such chains.

5. Sociological Analysis of AFNs: Quality, Trust and Social Networks

Current international research in the field of 'sociology and geography of food' has provided excellent analyses and critiques of systems of production and commercialization of a variety of agricultural products (e.g. bananas, papayas, tomatoes, French beans, broccoli, etc.) by adopting approaches borrowed from political economy and Actor-Network Theory. These studies, however, have tended to overlook how and why 'quality' is an important aspect of agricultural production, a key element to explain the way AFNs work.

A common point across the various definition of quality is that in the 'economy of quality' goods value cannot be acknowledged only by price and quality standards as signal are instead crucial (CALLON, MÉADEL, RABEHARISON 2002). Quality standards sig-

nal information about the attributes of a product (BARBERA, AUDIFREDI 2012). These attributes can be classified depending on the ease with which they can be measured. Search attributes are those that can be verified at the time of the transaction (e.g. the colour of a wine). Experience attributes can be assessed only after the transaction has taken place (e.g. the taste of a wine). Credence attributes cannot be objectively verified and are based on trust (e.g. whether wine is produced from organic grapes) (TIROLE 1988).

This classification is customary but has two crucial shortcomings. First of all, it assumes an 'objective' idea of quality and it fails to see the social processes (e.g. rituals, framing, social identity) through which qualities are attributed, stabilized, objectified and arranged. Secondly, quality is usually analysed in a static way, overlooking the mechanisms that support the diffusion of quality. In the light of these two weaknesses, a sociological research agenda on AFNs should look at how quality conventions emerge among consumers and diffuse in different kinds of AFNs. Conventions theory argues that price and market are the main management form of a particular commodity chain only if there is no semantic uncertainty about quality (BOLTANSKI, THÉVENOT 2006; KARPIK 2010). If this is the case, differences in price directly express known differences in quality. When price alone cannot evaluate quality, actors set up other conventions and 'forms of co-ordination': inspirational, domestic, opinion, civic, and industrial which reduce semantic uncertainty. The application of the theory of conventions in rural sociology therefore supports the idea that quality is one of the most important force leading to the raise and change of markets and, at the same time, the 'power' of quality must be found over and above information and prices in a process through which a mutual judgment about quality raises, changes and, eventually, even disappears. These quality conventions spread from consumers to producers, pointing to the relevance of an analysis that includes 'complete' commodity circuits from production to consumption and not, as it is usually done, only from production to distribution.

Conclusion

The research agenda so far outlined will improve the existing literature on AFNs with regard to several key issues. The territorial interpretation makes it possible to take a giant step forward in the comprehension of AFNs by combining their spatial organisation, their link to resources, and their social relations. As the environmental analysis is concerned, we need to consider the overall territorial system involved in the AFNs. Established LCA often considers single commodity processes and usually confines itself to the farm/production phase only. Both the complexity and territorial embeddedness of value chain and the consumers behaviour are not taken into account. With regard to the economic analysis, we urge to examine in a detailed way the economic determinants of the farmers' choice to use the AFNs, and at the same time the determinants of the consumers in using, from the demand side, the same chains.

Finally, with regard to the sociological analysis, research should address the mechanisms through which quality conventions emerge and spread from consumers to producers, as well as how quality specifications travel along the value chain and shape the organizational structure of rural producers.

All in all, the outlined framework allows first of all to empirically investigate the determinants and the modalities of creation and of territorial configuration of AFNs: in particular, the territorialisation of the AFNs and their capability to enhance local development practices. Secondly, it points to the long-term sustainability of AFNs from the environmental and economic standpoint, i.e., their capacity to survive economically as a system, and to entail a lower environmental impact than 'traditional' chains. Third, it highlights the capacity of AFNs to create different coordination mechanisms between consumers and producers not only from a logistic and organisational point of view, but also in terms of implicit agreements on quality standards, regardless of legal or official labels. These elements, considered as a whole, may help to clarify the variety, combination and dynamics of quality conventions, the forms of social and territorial networks, the role of social identity and their relationship to the environmental and economic elements of AFNs.

References

- BARBERA F., AUDIFREDI S. (2012), "In Pursuit of Quality. The Institutional Change of Wine Production Market in Piedmont", *Sociologia Ruralis*, vol. 52, n. 3, pp. 311-331
- BECKIE M.A., KENNEDY E.H., WITTMAN H. (2012), "Scaling up alternative food networks: farmers' markets and the role of clustering in western Canada", *Agriculture and Human Values*, vol. 29, n. 3, pp. 333-345.
- BOLTANSKI L., THÉVENOT L. (2006), *On Justification, Economies of Worth*, Princeton University Press, Princeton
- CALLON M., MÉADEL C., RABEHARISOA V. (2002), "The economy of qualities", *Economy and Society*, vol. 31, n. 2, pp. 194-217.
- CARROL B. (2012), "Alternative Food Networks: Knowledge, Practice, and Politics", *Environmental Values*, vol. 21, n. 4, pp. 529-531
- CEMBALO L., MIGLIORE G., SCHIFANI G. (2012), "Consumers in Postmodern Society and Alternative Food Networks: The Organic Food Fairs Case in Sicily", *New Medit*, vol. 11, n.3, pp.41-49.
- CORSI A., BORSOTTO P., BORRI I., STRØM S. (2009), "Diversification of the marketing chains among organic producers", Contributed Paper prepared for presentation at the International Association of Agricultural Economists Conference, Beijing, China, August 16-22.
- DEMATTEIS G. (2007), "Per una geografia dell'agire collettivo. Introduzione", in BORGARELLO G., DANSERO E., DEMATTEIS G., GOVERNA F., ZOBEL Z. (eds.). *Linee guida per lavorare insieme nei sistemi territoriali locali. Progetto "Promozione della sostenibilità nel Pinerolese". Un percorso di ricerca/azione territoriale*, Provincia di Torino - Regione Piemonte, Torino, pp. 41-54.
- DEMATTEIS G., GOVERNA F. (2005), *Territorialità, sviluppo locale, sostenibilità: il modello SLOT*, FrancoAngeli, Milano.
- FAFCHAMPS M., VARGAS HILL R. (2005), "Selling at the Farmgate or Travelling to market", *American Journal of Agricultural Economics*, vol. 87, pp. 717-734
- FEENSTRA G., (1997), "Local food systems and sustainable communities", *American Journal of Alternative Agriculture*, vol. 12, pp. 28-36.
- FLETCHER S.M., TERZA J.V. (1986), "Analyzing Farmers' selection of Available Marketing Alternatives Using the Multivariate probit Model", *Canadian Journal of Agricultural Economics*, vol. 34, pp. 243-252

- FU T., EPPERSON J.E., TERZA J.V., FLETCHER S.M. (1988), "Producer Attitudes Toward Peanut Market Alternatives: An Application of Multivariate Probit Joint Estimation", *American Journal of agricultural Economics*, vol. 70, pp. 910-918
- GOETZ S.J. (1992), "A Selectivity Model of Household Food Marketing Behavior in Sub-Saharan Africa", *American Journal of agricultural Economics*, vol. 74, pp. 444-452.
- GOSZCZYNSKY W., KNIEC W. (2011), "Strengthening Alternative Agro-food Networks in the Eastern European Countryside", *Eastern European Countryside*, vol. 17, pp. 5-20.
- JESSOP B., BRENNER N., JONES M. (2008), "Theorizing sociospatial relations". *Environment and Planning D: Society and Space*, vol. 26, pp. 389-401.
- KARPIK L. (2010), *Valuing the Unique: The Economics of Singularities*, Princeton University Press, Princeton.
- KEY N., SADOULET E., DE JANVRY A. (2000), "Transaction Costs and agricultural Household Supply Response", *American Journal of agricultural Economics*, vol. 82, pp. 245-259
- MAGNAGHI A., (2005), *The urban village. A charter for democracy and local self-sustainable development*. Zed Books, London.
- MARSDEN T., BANKS J., BRISTOW J. (2000), "Food supply chain approaches: exploring their role in rural development", *Sociologia Ruralis*, vol. 40, n. 4, pp. 424-428.
- MARSDEN T., (2004), "Theorising food quality: some issues in understanding its competitive production and regulation", in HARVEY M., McMEEKIN M., WARDE A. (eds), *Qualities of food*, Manchester University Press, Manchester.
- MCLEAY F., ZWART T. (1998), "Factors Affecting Choice of Cash Sales Versus Forward Marketing Contracts", *Agribusiness*, vol. 14, pp. 299-309
- MORRIS C., KIRWAN J. (2011), "Exploring the Ecological Dimensions of Producer Strategies in Alternative Food Networks in the UK", *Sociologia Ruralis*, vol. 51, n. 4, pp. 349-369.
- PAUEL V., MCKENZIE F.H., HASLAM F. (2013), "Peri-urban farmland conservation and development of alternative food networks: Insights from a case-study area in metropolitan Barcelona (Catalonia, Spain)", *Land Use Policy*, vol. 30, n. 1, pp. 94-105
- PARROT N., WILSON N., MURDOCH J., (2002), "Spatialising quality: regional protection and the alternative geography of food", *European Urban and Regional Studies*, 9 (3), pp. 241-261.
- RAFFESTIN C. (1980), *Pour une géographie du pouvoir*, Litec, Paris.
- RAFFESTIN C. (2012), "Space, territory and territoriality", *Environment and Planning D: Society and Space*, vol. 30, n. 1, pp. 121-141.
- ROEP D., WISKERKE J.S.C. (2012), "On Governance, Embedding and Marketing: Reflections on the Construction of Alternative Sustainable Food Networks", *Journal of Agricultural & Environmental Ethics*, vol. 25, n. 2, pp. 205-221
- SONNINO R., MARSDEN T. (2006), "Beyond the divide: rethinking relationships between alternative and conventional food networks in Europe", *Journal of Economic Geography*, vol. 6, pp. 181-199.
- TIROLE J. (1988), *The Theory of Industrial Organisation*, MIT Press, Cambridge.
- TREGGAR A. (2011), "Progressing knowledge in alternative and local food networks: critical reflections and a research agenda", *Journal of Rural Studies*, vol. 27, pp. 419-430.
- VAN DER WERF H.M.G., PETIT J. (2002), "Evaluation of the environmental impact of agriculture at the farm level: a comparison and analysis of 12 indicator-based methods", *Agriculture, Ecosystem and Environment*, vol. 93, pp. 131-145.
- VOLPENTESTA A.P., AMMIRATO S. (2013), "Alternative agrifood networks in a regional area: a case study", *International Journal of Computer Integrated Manufacturing*, vol. 26, n. 1, pp. 55-66.

Abstract

The paper outlines a framework of the existing literature upon Alternative Food Networks moving from four different although interrelated standpoints: territorial, environmental, economic, and sociological. The territorial perspective will highlight the modalities through which agri-food networks are organised at different geographical scales and affect the territories they are linked to. The environmental analysis will urge to go beyond a simple, even if very complex to study, "Life Cycle Assessment" to take into account the multi-functionality of farms and the territorial dimensions of the area where the supply chains is placed. The economic standpoint will outline the necessity to examine both the economic determinants of the farmers' choice to use the AFNs and the mechanisms explaining why consumers are using, from the demand side, the same chains. Finally, the sociological analysis will point to the mechanisms through which quality conventions emerge and diffuse in AFNs.

Keywords

Alternative Agri-Food Networks, Territoriality, Social Networks, Quality conventions, Life Cycle Assessment

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