

Contributions to Management Science

Paola De Bernardi  
Danny Azucar

# Innovation in Food Ecosystems

Entrepreneurship for a Sustainable  
Future

 Springer

# Contents

<b>1</b>	<b>The Food System Grand Challenge: A Climate Smart and Sustainable Food System for a Healthy Europe</b> . . . . .	<b>1</b>
1.1	Introducing Actual Food Systems: <i>From “Farm to Fork” to “Industry to Fork”</i> . . . . .	2
1.1.1	Grand Challenges Related to Actual Food Systems . . . . .	2
1.1.2	A Focus on the European Scenario . . . . .	4
1.1.3	Global Food Systems in a Networked Society . . . . .	5
1.2	Sustainable Development in Food Systems: Highlighting a Need for Transition . . . . .	6
1.3	Holistic Thinking and Sustainable Food Systems . . . . .	8
1.3.1	A Sustainable Food System Approach: The Food System Wheel . . . . .	10
1.3.2	The Food System Development Paradigm . . . . .	11
1.4	Addressing the Sustainability Paradigm in the European Union . . . . .	12
1.4.1	Safeguarding the Agricultural Sector and Food Consumers . . . . .	13
1.4.2	Managing Waste: The Waste Framework Directive and Other Network Policies . . . . .	14
1.4.3	Transitioning Toward a Circular Economy: The Circular Economy Action Plan . . . . .	15
1.5	From Food Systems to Food Ecosystems . . . . .	15
1.5.1	Innovation as a Driver in Food Ecosystems . . . . .	17
1.5.2	Sustainable Innovation in Food Ecosystems . . . . .	18
1.6	Entrepreneurship and Innovation as Key Elements for Sustainability . . . . .	19
1.7	Conclusion . . . . .	20
	References . . . . .	22

<b>2</b>	<b>The Role of Universities in Harnessing Entrepreneurial Opportunities</b> . . . . .	27
2.1	Introduction: Entrepreneurs and Entrepreneurial Opportunities in Food Systems . . . . .	27
2.2	It All Begins with an Opportunity . . . . .	30
2.3	The Focus on Entrepreneurship . . . . .	31
2.4	Entrepreneurial Opportunity . . . . .	35
2.5	Opportunity Discovery and Creation in Food Systems . . . . .	39
2.5.1	Opportunity Creation: Tangible Resources . . . . .	41
2.5.2	Opportunity Recognition: Intangible Resources . . . . .	41
2.6	Entrepreneurial Universities . . . . .	42
2.7	Entrepreneurship Education . . . . .	46
2.8	Entrepreneurship Centers . . . . .	49
2.8.1	Technology Transfer Offices/Centers . . . . .	52
2.8.2	Incubators . . . . .	53
2.8.3	Accelerators . . . . .	54
2.9	Triple-Helix Approaches . . . . .	55
2.9.1	The Knowledge Triangle . . . . .	56
2.10	Conclusion . . . . .	58
	References . . . . .	60
<b>3</b>	<b>Innovation and Entrepreneurial Ecosystems: Structure, Boundaries, and Dynamics</b> . . . . .	73
3.1	Introducing the Ecosystems Concept . . . . .	74
3.2	Innovation Ecosystems . . . . .	75
3.2.1	Differences Between Innovation Ecosystems and Other Cluster Approaches . . . . .	76
3.2.2	An Innovation Ecosystems Mapping Effort: The Ecosystem Pie Model . . . . .	76
3.3	Entrepreneurial Ecosystems . . . . .	79
3.3.1	The Emergence of Entrepreneurial Ecosystems . . . . .	81
3.3.2	Limitations and Further Developments of Current Studies . . . . .	82
3.4	Structure of Innovation and Entrepreneurial Ecosystems . . . . .	83
3.4.1	Similarities . . . . .	83
3.4.2	Differences . . . . .	85
3.4.3	Boundaries . . . . .	86
3.4.4	Personal and Systemic . . . . .	90
3.4.5	Dynamics . . . . .	90
3.4.6	Change, Growth, and Performance . . . . .	91
3.4.7	Drivers . . . . .	95
3.4.8	Challenges . . . . .	97
3.5	Food Systems . . . . .	98
3.6	Conclusion . . . . .	99
	References . . . . .	100

- 4 Innovation for Future Proofing the Food Ecosystem: Emerging Approaches** . . . . . 105
  - 4.1 Introduction . . . . . 105
  - 4.2 Innovation in Food Ecosystems . . . . . 107
  - 4.3 Open Innovation in Food Ecosystems . . . . . 108
  - 4.4 Emerging Food Approaches . . . . . 110
  - 4.5 Vertical Farms . . . . . 117
    - 4.5.1 Aeroponics . . . . . 118
    - 4.5.2 Aquaponics . . . . . 118
    - 4.5.3 Hydroponics . . . . . 119
  - 4.6 Short Food Supply Chains . . . . . 120
  - 4.7 Precision Agriculture . . . . . 123
  - 4.8 Bio-Fertilizers . . . . . 125
  - 4.9 Meat Alternatives . . . . . 126
  - 4.10 Waste Reduction . . . . . 127
  - 4.11 Health and Wellbeing . . . . . 128
  - 4.12 Conclusion . . . . . 130
  - References . . . . . 131
- 5 Entrepreneurial Food Ecosystem: Strategic Driver to Boost Resilience and Sustainability** . . . . . 135
  - 5.1 Introduction . . . . . 135
  - 5.2 Beyond Linearity in Food Supply Chains: Systems Thinking . . . . . 137
  - 5.3 Resilience and Sustainability in Food Ecosystem . . . . . 140
    - 5.3.1 Barriers to Resilience . . . . . 141
  - 5.4 Holistic Innovation and Entrepreneurship . . . . . 143
  - 5.5 Systems Thinking for Food System Transformation . . . . . 145
  - 5.6 Responsible Research and Innovation (RRI) and Food Systems . . . . . 148
  - 5.7 Multi-level Innovation and Entrepreneurship . . . . . 152
  - 5.8 Conclusions . . . . . 153
  - References . . . . . 156
- 6 Startups and Knowledge Sharing in Ecosystems: Incumbents and New Ventures** . . . . . 161
  - 6.1 Introduction . . . . . 162
  - 6.2 Knowledge into Practice . . . . . 165
  - 6.3 Startups and High Growth Firms (HGFs) . . . . . 166
  - 6.4 Aligning Solutions to Consumer Needs . . . . . 169
    - 6.4.1 Market Research . . . . . 170
    - 6.4.2 Competitive Landscape . . . . . 171
    - 6.4.3 SWOT Analysis . . . . . 171
  - 6.5 From Ideas to Business Models and Business Plans . . . . . 173
    - 6.5.1 Writing a Business Plan . . . . . 173
    - 6.5.2 Company Overview: ‘About Us’ . . . . . 174
    - 6.5.3 Product or Service Offered . . . . . 174

- 6.5.4 Target Market, Customers, and Competition . . . . . 174
- 6.5.5 Sales and Marketing Strategies . . . . . 175
- 6.5.6 Operations . . . . . 175
- 6.5.7 The Startup Team . . . . . 176
- 6.5.8 The Financial Plan . . . . . 176
- 6.6 Digitalization as a Driver for Entrepreneurial Ecosystems  
and Business Creation: Fact or Fiction . . . . . 177
- 6.7 Startups and Innovation Ecosystems: Do They Work? . . . . . 179
- 6.8 Your Startup, Your Brand . . . . . 182
  - 6.8.1 Brand Positioning . . . . . 183
  - 6.8.2 Sustainability and Brand Creation . . . . . 183
- 6.9 Conclusion . . . . . 184
- References . . . . . 185
- 7 Innovative and Sustainable Food Business Models . . . . . 189**
  - 7.1 Introduction . . . . . 190
  - 7.2 Business Model . . . . . 190
  - 7.3 Business Model Innovation . . . . . 192
  - 7.4 Business Model Innovation for Sustainability . . . . . 197
  - 7.5 Circular Business Models . . . . . 198
  - 7.6 Business Modelling: Tools for Designing New Business  
Models . . . . . 202
  - 7.7 Business Models in the Food Sector: Where Are We Going? . . . . . 207
    - 7.7.1 Food-Tech . . . . . 208
    - 7.7.2 Agri-Tech . . . . . 210
    - 7.7.3 Food Digital Platform . . . . . 211
    - 7.7.4 Urban Food . . . . . 212
    - 7.7.5 Food on Demand . . . . . 213
  - 7.8 Conclusion . . . . . 214
  - References . . . . . 215
- 8 Funding Innovation and Entrepreneurship . . . . . 223**
  - 8.1 Introduction . . . . . 223
  - 8.2 The Supply of Finance . . . . . 226
  - 8.3 Venture Capital . . . . . 230
    - 8.3.1 Structure . . . . . 233
    - 8.3.2 Investment Strategy . . . . . 234
    - 8.3.3 Corporate Governance . . . . . 236
    - 8.3.4 Alignment of Interest: Carried Interest . . . . . 239
  - 8.4 Corporate Venture Capital . . . . . 239
  - 8.5 Conclusions . . . . . 242
  - References . . . . . 243

- 9 A European Food Ecosystem: The EIT Food Case Study . . . . . 245**
  - 9.1 Introduction: The European Institute of Innovation and Technology (EIT) . . . . . 246
    - 9.1.1 Knowledge and Innovation Communities (KICs) . . . . . 249
  - 9.2 EIT Food: Pan-European Food Network . . . . . 250
    - 9.2.1 EIT Food Co-location Centers . . . . . 251
  - 9.3 EIT Food Vision, Mission, Strategy, Values and Goals . . . . . 256
  - 9.4 EIT Food Strategic Pillars and Business Areas . . . . . 261
    - 9.4.1 Innovation . . . . . 262
    - 9.4.2 EIT Food’s Innovation Programs . . . . . 263
    - 9.4.3 Education . . . . . 264
    - 9.4.4 Business Creation and Entrepreneurship . . . . . 264
    - 9.4.5 Communication and Public Engagement . . . . . 265
  - 9.5 EIT Food Growth Strategy . . . . . 267
  - 9.6 EIT Food Organizational Structure . . . . . 268
    - 9.6.1 EIT Food Organizational Governance Structure . . . . . 268
  - 9.7 Multi-Annual Business Models . . . . . 269
    - 9.7.1 Financial Sustainability . . . . . 272
  - 9.8 EIT Community . . . . . 272
    - 9.8.1 EIT Food Partnerships . . . . . 272
    - 9.8.2 Partner Categories . . . . . 273
  - 9.9 Start-Up Support . . . . . 275
    - 9.9.1 Rising Food Stars . . . . . 275
    - 9.9.2 EIT Food Sparks . . . . . 276
  - 9.10 EIT Food Impact . . . . . 276
    - 9.10.1 EIT Food Impact through Synergies . . . . . 276
    - 9.10.2 Key Performance Indicators . . . . . 277
  - 9.11 Conclusions . . . . . 278
  - References . . . . . 279

# Chapter 7

## Innovative and Sustainable Food Business Models



**Abstract** Companies are called upon to solve the great challenges of the new millennium. The food sector, from this point of view, plays a strategic role. Poverty, malnutrition, hunger, climate change, and social inequalities are just some of the trends which the agri-food sector has to cope with. The digital transformation that companies will need to embrace to survive requires new ways of creating, thinking, and working with technology-driven tools to provide value for their businesses and customers. Digitization, whether it pertains to new technologies, the analysis of big data or the development of on-line and spatial applications, can contribute to achieving systemic food production transformation in a way that aligns the sector more closely with contemporary sustainability and health challenges. Digital techniques are leading established companies to renew and innovate their business models by connecting producers to consumers, setting up innovative marketing channels, and improving logistics. Artificial intelligence for smart farming, precision and urban farming, data management for waste-less, blockchain for supply chain traceability and auditability are just some of the disruptive technologies which have been adopting by both start-ups and an increasing number of established companies, redefining their business models. This chapter aims to analyse how these new paradigms are impacting the food sector by providing examples from the real world.

**Keywords** Business model · Food industry · Business model innovation · Grand challenges · Sustainability

---

Co-authored by Canio Forliano—Department of Management, University of Turin, School of Management and Economics, Turin, Italy  
Department of Political Science and International relations, University of Palermo, Palermo, Italy, e-mail: canio.forliano@unito.it  
Co-authored by Mattia Franco—Department of Management, University of Turin, Turin, Italy, e-mail: mattia.franco@unito.it