

# Chapter 5

## Business Model Innovation and Transition to a Sustainable Food System: A Case Study in the Lisbon Metropolitan Area

Isabel Salavisa, and Maria de Fátima Ferreiro

**Abstract** The food systems' transition towards a sustainable involves structural changes, namely the emphasis on local production, short supply chains, and the preference for organic products.

The shift in the agri-food system is taking place through the creation of entirely new businesses and individual farms moving towards organic production. In both cases, the enterprises use a combination of well-established agricultural knowledge and techniques, new scientific knowledge on productive methods and new technological platforms for commercialization. These mixed sources permit the creation of innovative business models (BMs). They exemplify how traditional industries can absorb/generate innovation at technological and organizational levels, and become part of the new knowledge-based era.

The study has three objectives: to analyse the emerging agri-food businesses in the Lisbon Metropolitan Area (LMA); to characterize innovative sustainable BMs within the transition dynamics; to reflect on the challenges that the characteristics of the food system pose for the emergence of these BMs.

The study is part of an interdisciplinary project on Spatial Planning for Change (SPLACH). The analysis addresses the food system transition in a specific territory, namely the LMA. The paper presents results of the research conducted, focusing on the case of an organic food initiative, Quinta do Oeste.

**Keywords** Food System Transition • Business Models Innovation • Sustainable Business Models • Technological Innovation

---

I. Salavisa

ISCTE-Instituto Universitário de Lisboa, Lisboa, Portugal

e-mail: isabel.salavisa@iscte-iul.pt

M. F. Ferreiro

ISCTE-Instituto Universitário de Lisboa, Lisboa, Portugal

e-mail: fatima.ferreiro@iscte-iul.pt

## 5.1 Introduction

Transition to sustainability is at the top of the political and policy agenda in most countries. It requires structural transformations in several domains, involves distinct actors and organisations, and calls for new policies.

The various domains can be conceptualized as large socio-technical systems addressing major societal functions, such as the provision of energy, nutrition, housing and transportation. Transitions arise from the alignment of niche innovations, socio-technical regimes and the landscape. This is the perspective of the transitions literature, which combines innovation systems economics, contributions from the sociological literature on transitions, and science and technology studies. In this field, most studies have focused on energy or transportation systems, with only a meagre percentage (3%) addressing the food system (Markard, Raven, & Truffer, 2012).

Low-carbon transitions in agriculture and the food system pose major challenges. They involve a wide range of actors, from farmers to consumers. Niche innovations are still relatively incipient due to high costs, entrenched diet preferences, a powerful and reluctant incumbent industry and weak policies (Geels, Sovacool, Schwanen, & Sorrell, 2017). However, this is a domain where a variety of bottom-up experiments are taking place that involve consumers, producers, municipalities, associations and public entities, thus making it a very interesting case.

The reasons and motivations underlying the emergence of these experiments include the search for better quality food, ethics, and environmental concerns; indeed, they quite often come together to induce the change in social practices related to nutrition, both on the consumer and producer sides.

This study has three main objectives: to identify and analyse the emerging agri-food businesses in the Lisbon Metropolitan Area (LMA); to characterize innovative business models (BM) within the transition dynamics towards sustainability; to reflect on the challenges posed by the characteristics of the food system for the emergence of innovative sustainable BMs.

Our focus is on the production side, that is, the organic farming business. To this end, the paper is organized as follows: section 2 presents the theoretical background; section 3 describes the methodological options; section 4 presents the case study; section 5 concludes.

## 5.2 Theoretical Background

### 5.2.1 The Food System as a Multidimensional Reality

The food system is a complex and multifaceted reality, defined as a broad system made up of “the activities, infrastructure, and people involved in feeding the global population (e.g., the growing, processing, distribution, consumption, and disposal of foods). It includes the web of processes by which institutions, organizations, and

individuals transform inputs into foods and individual ingredients into the food we consume” (Popkin, 2017, p.73). As Popkin (2017) points out, this system interacts with the environment, the society, the economy and the political domain.

A food supply chain or value chain is a good example of a large system unfolding in time and space “from farm to fork” (Popkin 2017, p.73). Some authors, however, prefer to distinguish two separate but closely interlinked systems, namely food production and food consumption (Green, Harvey, & Mcmeekin, 2003).

In the paper, we will retain the notion of a value chain, with different stages and important feedback loops between the various stages. Complementary activities, such as agrochemicals, packaging and transportation, to mention just the most relevant, are not depicted in the diagram (Figure 5.1).



**Fig. 5.1** Food value chain

In most developed countries, processing and wholesale are dominated by a small number of large companies. Although large chains also dominate in retail, they coexist with small businesses (corner and convenience shops, traditional food outlets, and small groceries). However, farming and consumption involve thousands or even millions of actors.

Therefore, the transformation of this set of activities implies a multitude of actors with asymmetrical power. This is why the creation of networks, formal collaborations and associations is so important for innovative producers. Policies also play a crucial role in setting the regulatory environment, boosting the emergence and deployment of new experiments and promoting healthier diets. As Popkin (2017) stresses, a strong intake of highly processed food affects the consumers’ health, and this calls for a global shift in nutrition.

To sum up, change is motivated by the growing awareness of the environmental impact together with health concerns. Mention must also be made of ethical issues related with the extractive use of natural resources and the dominant systems of animal husbandry.

## 5.2.2 Food System Transition

In agriculture, transition means a shift from the ‘productivist regime’ aimed at production growth and high yields to a regime built around the principles of sustainability (Brunori *et al.*, 2013, p.28).

The ‘productivist’ paradigm is capital and agrichemicals-intensive, usually highly specialized or even single-product, with strong mechanization and focused on increasing efficiency and productivity but with a disregard for soil conservation and

landscape protection. Conversely, the post-productivist paradigm is multifunctional, locally embedded, more labour-intensive and aimed at balancing economic viability, high quality food, environmental concerns, and a new lifestyle (Wilson, 2008).

Due to the specificity of the food system, technological innovations may be “dismissed as a potentially productive analytical entry point for work on sustainability transitions in food and agriculture” (Hinrichs, 2014, p.147). This is due to both the intimate links of agriculture and food production with living land and bodies, and the capital-intensive trajectory of the system’s modernization over the 20th century (Hinrichs, 2014). As a result, the nutrition transition has to rely on a broader framework than that of the energy system, which has been based largely on the emergence and scaling up of new renewable energy technologies.

Transition will arise from the combination of numerous experiments (Sengers, Wieczorek, & Raven, 2016). Technological innovations play a less prominent role than in other sectors (Geels *et al.*, 2017), and new and old elements coexist, particularly in farming and retail. Major transformations must be made to the dominant approach, due to the relevance of organizational and marketing innovations.

Organizational and marketing innovations, such as alternative food networks and the extensive use of internet for commercialization, are widespread in organic farms, along with new production technologies, such as inputs arising from biotechnological advances to improve cultivation methods and obtain quality products. These farms use tests for certification and achieve high-level quality parameters of their products. Meanwhile, they also use traditional knowledge about soil conservation and farming practices. In short, they create innovative business models that depend on supportive networks of customers, retailers, local authorities and public entities. These networks are critical for the new businesses. They permit the sharing of knowledge and information and the creation of commercialization channels. In addition, they reinforce the sense of belonging to a group that has a strong identity and offers an alternative to the mainstream behaviour and value patterns (Ingram, Maye, Kirwan, Curry, & Kubinakova, 2015).

In retail, new and old forms also combine through the creation of large and varied commercial networks involving farmers’ markets, box schemes, traditional food shops, new organic product chains and incumbents’ departments devoted to organic products. The expansion of short supply circuits is a further example that minimizes the harm caused by long distance transportation of commodities, sometimes overseas.

Public entities play a relevant role, in this case through the procurement of quality food by school and hospital canteens as well as public campaigns aimed at promoting healthy diets and ultimately boosting the market for quality food – fresh, seasonal, organic – with less impact on the environment (Bui, Cardona, Lamine, & Cerf, 2016; Cohen & Ilieva, 2015).

In sum, the combination of distinctive sources of knowledge in production activities, the creation of organizational and marketing innovations and the use of supportive networks are all essential to the transformation of the food sector towards sustainability. This shift is indissociable from the creation of innovative and sustainable business models.

### 5.2.3 Innovative Business Models for Sustainable Farming

Business models (BMs) correspond to the approach taken by firms, their partners and customers to create, deliver and capture value (Kurucz, Colbert, Luedeke-Freund, Upward, & Willard, 2017, p.193). Methods used to achieve a ‘generic business model concept’ (e.g., Boons & Lüdeke-Freund, 2013, p.11) include the identification of the following elements:

- Value proposition (type of value embedded in product/service)
- Supply chain (characterization of relationships with suppliers)
- Customer interface (characterization of relationships with customers)
- Financial model (costs, benefits and their distribution across business model stakeholders)

The BM concept has been reassessed in the light of the transition pathways to sustainability. Recent research in this field highlights the different approaches to and models of BM and the innovation required to address social and environmental values, more sustainable supply chains, and customer interface. Indeed, the critical role played by BMs in the change towards sustainable societies constitutes the research topic of a number of studies (e.g., Bocken, Short, Rana, & Evans, 2014; França, Broman, Robèrt, Basile, & Trygg, 2017; Osterwalder & Pigneur, 2010; Upward & Jones, 2016). The main issues addressed by these studies are as follows: i) types of BM and their link with sustainability; ii) innovation in BMs towards a transition pathway.

The literature on BMs and their relationship with sustainability goals identifies a number of limitations of conventional BMs. In fact, the primacy or exclusivity of monetary returns to shareholders via profits and other quantitative and financial metrics has tremendous negative externalities in social and environmental terms (Upward & Jones, 2016). As pointed out by Kurucz *et al.* (2017), organizations are required to change their goals to account for these externalities. This shift, in turn, entails enhanced methods and tools that overcome this fundamental limitation of conventional approaches to business modelling. Specific adaptations and extensions must be made that align business models with sustainability objectives (Kurucz *et al.*, 2017, p.193).

The reasons for conventional BMs’ failure to integrate the sustainability dimension (Boons & Lüdeke-Freund, 2013; Upward & Jones, 2016) are related with a poor understanding of the sustainability issue, the limited time and system scope, and insufficient collective action in sustainable business (Baumgartner & Korhonen, 2010; Rohrbeck, Konnertz, & Knab, 2013; Stubbs & Cocklin, 2008). As a result, we witness a “lost opportunity for advancing and embedding sustainability throughout business-value creation processes via business models” (França, Broman, Robèrt, Basile, & Trygg, 2017, p.156).

Therefore, BM innovation for sustainability purposes constitutes a critical aspect within paradigmatic transformations envisaging more sustainable societies. In this sense, and to overcome the limitations of conventional BM in this regard, we need to adopt a specific approach that is strategically and explicitly aligned with sustainability goals (Kurucz *et al.*, 2017). According to Bocken *et al.* (2014), the BM shift involves

“innovations that create significant positive and/or significantly reduced negative impacts for the environment and/or society, through changes in the way the organization and its value-network create, deliver value and capture value (i.e. create economic value) or change their value propositions” (Bocken *et al.*, 2014, p.44).

The Framework for Strategic Sustainable Development (FSSD) is the most prominent reference in the literature focused on BM and sustainability. According to França *et al.* (2017), we are dealing with “a unifying framework for sustainability analyses, planning, cross-disciplinary and cross-sector cooperation, and cohesive use of the myriad sustainability tools, methods and concepts” (França *et al.*, 2017, p.155). In their comprehensive description of the FSSD, Broman and Robèrt (2015) consider the need to combine and adopt multiple tools, methods and concepts through the following principles:

- Necessary, but avoiding excesses (e.g. restrictions and controversial aspects)
- Sufficient (covering all the important principles)
- General (context and scale of application)
- Concrete (real life problems)
- Non-overlapping (facilitating understanding and assessment)

Bearing these principles in mind, the definition of sustainability proposed was elaborated in collaboration with natural and social scientists. According to this proposal, the essential aspects that need to be accounted for in natural and social terms include “assimilation capacity, purification capacity, (...) production capacity, climate regulation capacity, and diversity. (...) trust between people and between people and societal institutions, diversity of personalities, ages, gender, skills, etc., common meaning, capacity for learning, and capacity for self-organization” (Broman & Robèrt, 2015, p.23).

FSSD is operationalized through a four-step procedure (known as ABCD) (França *et al.*, 2017) that can be summarized as follows: A) design of a global sustainability challenge (core purpose, core values and overall long-term goals); B) assessment of the entity/organization under analysis and assets to deal with sustainability goals; C) creative thinking and co-creation in order to close the gap between A and B; D) “a stepwise approach” guaranteeing effective advancements in the transition path. According to the authors, “this logic creates the opportunity for pragmatic leadership, not only looking at the promise of an improved bottom-line in the future, but also considering short-term profits designed in a way that opens up the potential for the longer-term profits. This way, the FSSD allows for the above outlined self-benefit of sustainability proactivity to be captured by businesses” (França *et al.*, 2017, p.160).

Innovation in the design of a BM with sustainability goals corresponds to the second domain in the BM research identified above. As already mentioned, FSSD is the central framework in the research on transforming BM into a sustainability tool (França *et al.*, 2017; Karlsson, Hoveskog, Halila, and Mattsson., 2018; Kurucz *et al.*, 2017; Rosca, Arnold, and Bendul, 2017; Upward & Jones, 2016). Product-service systems (PSS), Business Model Canvas (BMC), Strongly Sustainable Business Model Canvas (SSBMC), and Future-Fit Business Benchmark (F2B2) are the most frequent approaches mentioned in the literature.

The Product-Service Systems approach reassesses the functional value to end-users of a mix of products and services, where “value creation is less about sales and ownership of individual products and more of a focus on the ongoing delivery of the service-value embedded in that product” (França *et al.*, 2017, p.156). Modern information and communication technologies and supply webs are important tools. In the case of food systems, the recovery of local and seasonal products, and short supply chains (e.g. local markets), and the direct contact between farmers and consumers, for instance, are integrated with advanced technology such as web services and other information and communication technologies, fuelling the demand for products and access to relevant information on the products consumed.

The Business Model Canvas is a tool that allows the visualization of the business model on a canvas. The components and their interactions are designed in a single page through nine blocks. They make it possible to visualize how an organization creates, delivers and captures value, covering the four main areas of the business: customers, value offer, infrastructure, and financial viability (França *et al.*, 2017, p.157) (Figure 5.2).

<b>Key partners</b>	<b>Key activities</b>	<b>Value Proposition</b>	<b>Customer Relationships</b>	<b>Customer Segments</b>
	<b>Key resources</b>		<b>Channels</b>	
<b>Cost structure</b>		<b>Revenue Streams</b>		

**Fig. 5.2** The business model canvas (adapted) (França *et al.*, 2017)

The Strongly Sustainable Business Model Canvas (SSBMC) seeks to “help organizations of all kinds to identify opportunities for developing new and transforming existing business models in ways that increase the possibility for contributions to strategic sustainability” (Kurucz *et al.*, 2017, p.193). Finally, the Future-Fit Business Benchmark (F2B2) proposes an assessment framework to overcome the perceived limitations of the methods currently used in sustainability reporting, ratings, and standards (Kurucz *et al.*, 2017, p.193). In sum, all these management tools endorse the FSSD concepts and principles in order to overcome the BM’s limitations regarding sustainability values.

Research by Kurucz *et al.* (2017) highlights the role of ‘relational leadership’ and knowledge in the implementation of strategic sustainability (FSSD), through both the SSBMC and the F2B2. In the SSBMC, collective meaning making is “enabled by a shared language based on an integrative view of the complex knowledge of environmental, social and economic value co-production for stakeholders into a limited number of questions situated in their necessary contexts”. In the F2B2, collective meaning making is “supported by translating complex knowledge from the natural and social sciences into a limited number of business principles” (Kurucz *et al.*, 2017, p.190).

Conversely, other authors stress the strategic importance of using different forms of knowledge and science. For example, Upward and Jones (2016) defend an “enterprise framework compatible with natural and social sciences”. This framework resorts to ecological economics “derived from natural, social, and system sciences” and uses suitable concepts for strongly sustainable business models, namely the “selection of stakeholders with moral justice” and “governance design” (Upward & Jones, 2016, p. 97 and p. 105).

In the case of the agri-food sector, conceptualizing BM innovation towards sustainability poses a number of challenges. In fact, it is necessary to take the sector’s specificities into account, namely the strong interdependence of human-animal-nature elements, the connection with different territories and geographic aspects, and special characteristics of the food supply chain (e.g., the very different size and sustainability focus of companies) (Cagliano, Worley, & Caniato, 2016; Ulvenbland *et al.*, 2018). Therefore, an interdisciplinary approach is needed.

In addition, the combination of old and new knowledge is particularly important in the food sector transition. In the case of organic farms, for instance, the use of ICT is often combined with traditional knowledge (e.g., soil conservation). Research on the resilience of agriculture, food systems and rural areas also draws attention to this combination of ‘old’ and ‘new’. Some authors who call for a deeper understanding of knowledge and innovation in this sector, identified four related challenges for the future: “first, to make agricultural knowledge systems more responsive to contemporary challenges; second, to perceive knowledge and innovation as drivers of development; third, to move beyond old paradigms based on linear approaches and conventional assumptions; and fourth, to integrate ecological and social concerns with economic aspects” (Rivera *et al.*, 2018, p. 204).

Despite these findings, and quite surprisingly, the case of the food sector is practically absent from the literature on BM innovation for sustainability. In fact, the sector has a strong environmental and ecological impact related with natural resources usage (e.g. water, soil, biodiversity) and the consequent negative externalities. That is why it is so important and urgent to understand and systematize the sector’s BMs, namely the innovation needed to overcome its ‘unsustainability’ expressed by increasing globalization, changes in consumption patterns (out of season products processed in global chains), and the retailers’ accrued concentration of power (Fritz & Matopoulos, 2008).

According to Tell *et al.* (2016), the exceptions to the research gap are Beuchelt and Zeller (2012), Brocken *et al.* (2014), Markowska, Saemundsson, and Wiklund (2011),

and Teece (2010). The authors conclude that it is a new but expanding subject (Tell *et al.*, 2016, p. 9). Indeed, recent systematic literature reviews, participative methods and case studies (Barth, Ulvenblad, & Ulvenblad, 2017; Ulvenblad *et al.*, 2018; Ulvenblad, Ulvenblad, & Tell, 2019; Tell *et al.*, 2016) permit the identification of some key aspects in the debate on BM innovation for sustainability in the case of the food sector. However, and according to Ulvenblad *et al.* (2018, p. 3), for instance, it is important to conduct more research on the subject.

An interesting exception is Karlsson *et al.*'s (2018) study of a Swedish biogas-producing farm cooperative (Figure 5.3) which proposes to include the environment, society and economy. These dimensions have a hierarchical relationship: the environment encompasses society, and the society encompasses economy. The systemic view is one of the interesting aspects of their model as economic life is considered in social terms and society is approached in its environmental framework. This systematization corresponds to a change in the BM concept, which aims not only to benefit shareholders through profit maximization but also to foster social and environmental values (Karlsson *et al.*, 2018).



Fig. 5.3 The business model canvas in Karlsson *et al.*, 2018, p.272

As a preliminary conclusion, the research on BM innovation allowed key elements in the transition pathways to be identified, namely in the food sector. These include:

- The need to adopt a sustainability definition (FSSD) in order to systematize the main aspects in the process of business change.
- The role of environmental (and social) outputs as central in business design, as opposed to the exclusivity of monetary and financial metrics.
- The utility of participatory and clear methods in order to identify the main components of BM. Product-Service Systems, BMC, and SSBMC are interesting tools of business design.

- The need to consider various forms of knowledge and different sciences (e.g., natural, social), in order to clearly understand what is at stake in sustainability pathways.

To sum up, the research on BM innovation for sustainability goals should cross forms of knowledge, scientific areas, tools and methods, as well as communication techniques. The complexity and problematic nature of the sustainability problem entails numerous challenges for BM innovation, notably in the food sector. Some of these challenges will be presented in section 4.

### **5.3 Methodology**

The first step of the empirical study was to gather information about the most innovative experiments in organic farming in the Lisbon Metropolitan Area (LMA), and to select individuals for face-to-face interviews.

The second step, based on the theory, was to build a semi-open questionnaire to be applied to the business representatives. The questionnaire is organized in blocks, namely on the origins and evolution of the experiment; the profile and motivations of the interviewee; the existence of public support for the initiative; the characterization of the activities and the distinct business model dimensions, notably the productive and commercialization strategies, including the relationships and networking with suppliers, customers and similar producers; and the technological options in farming and commercialization.

The third step consisted of a scheduled visit to the venue and facilities of the selected farm (cultivated plots, greenhouses, warehouses, transformation facilities, farm shop and restaurant), and applying the questionnaire in a face-to-face interview with the farm's main representative. After obtaining permission, pictures were taken and the interview audiotaped. The products were tasted at a meal in the farm restaurant. Finally, the tape was transcribed and interpreted in the light of similar experiments reported in the literature.

### **5.4 The Case Study**

Quinta do Oeste, a family organic farm business located in the Lisbon Metropolitan Area (LMA) was selected for our case study. A visit was made to the farm in October 2018, when we conducted a semi-structured interview with the farm's main representative (owner and manager) and ate an organic food meal at the restaurant in the farm complex.

When Quinta do Oeste was acquired by the present owners' family in the late 1960s, it was dedicated to fruit production. Between 2007 and 2009, the heirs began the process of converting part of the farm to an organic production system with a view to incorporating differentiated products and creating a registered trademark. It is

interesting to note that this shift was motivated by the interviewee's desire to adopt a life style driven by sustainability values in farming. This is very much in line with the shift towards post-materialist values of a significant proportion of the population observed in many affluent societies (Tibbs, 2011).

The farm currently has 14 hectares dedicated to organic farming. A further 13 hectares, essentially the old orchard which they have not been able to reconvert, is farmed using conventional methods.

They produce, transform and distribute agri-food products and provide environmental and awareness training through workshops and field trips, including schools. They hold biological certification of cultivation methods.

In addition to their own production, they also buy from intermediaries to complete their offer (e.g. fruit, potato, onion and carrot). They sell 600 hampers a week in LMA through home delivery. They also sell directly to the public in their own store and local markets (e.g. Príncipe Real, Campo Pequeno, Cascais). The farm's main activities are complemented by a restaurant on-site where they serve high quality meals made of organic products.

In 2010, they obtained financing from the PRODER programme to convert facilities (greenhouses, and plant processing/packaging). More recently, they received support from LEADER - Local Action Group to remodel the restaurant. Both programmes rely on European Union funds (Common Agricultural Policy). This means that public funding has been important to the success of this initiative.

The interviewee also noted the importance of informal collaborative networks with other organic producers not only for the exchange of knowledge and information but also for the supply of products to complete their offer. This seems to be a common trait of this emerging sector in Portugal and elsewhere (Seyfang, 2006). These networks enhance the strong sense of belonging to a new community that assumes full responsibility for environmental matters. Reference was also made during the interview to customers' growing awareness of sustainability values, which has allowed Quinta do Oeste start the process of using alternatives to plastic in hampers more quickly.

The bet on brand development and communication was essential to the business strategy. Social networks (Facebook, Instagram, etc.) were just emerging when the project began but it is now essential both to feed these channels and to get their input in the company's web site. Together, they also function as virtual stores. The marketing strategy also targets big companies by sending newsletters to firms that act as delivery points, such as Roche, Microsoft, EDP, etc., and offering their employees discounts. This illustrates how Quinta do Oeste has built a sustainable business model.

The new value proposition consists of quality organic products. It relies on both traditional knowledge – in some cases ancient practices such as crop rotation to ensure soil fertility - and new technologies, namely the technological platforms in the commercialization stage (Boons & Lüdeke-Freund, 2013). In the newly configured value chain, the producer has close control of the process along a much-shortened path to the market. The value capture is improved because the products are relatively expensive and, unlike traditional farming, they do not compete via prices, and margins are not smashed by big retailers. The customer interface is fully modified. The

producer maintains a direct relationship with buyers, who have become active supporters and are also committed to health, food security and sustainability values and practices. The aim is not to maximize profit but to obtain a reasonable return to secure the economic health of the business and provide fair revenues for the owners and workers. Land ownership is a very important asset as the business might not otherwise be viable. In addition, supportive networks of suppliers, customers, producers and local entities, based on trust and shared values and goals, are a new element of this solution.

Table 5.1 depicts the particular business model of Quinta do Oeste and shows the main elements and relationships along the value chain.

**Table 5.1** The case study value chain

<b>Value Chain</b>	<b>What</b>	<b>Where</b>	<b>How</b>
<b>Production</b>	Seasonal organic vegetables and fruit	Local farm (14 ha; owner)  Other producers located in other places of the same region or other Portuguese regions (depending on the products)	Traditional techniques  New techniques  Informal networks (trust- based)
<b>Transformation</b>	Seasonal organic vegetables and fruit	Local farm and restaurant (14 ha, owner)	Traditional techniques  New techniques
<b>Commercialization</b>	Seasonal organic vegetables and fruit	Local and regional (LMA)  Local shop (owner)	Internet consumer registration and orders  Domestic and enterprise delivery (own vehicles)
<b>Consumption</b>	Seasonal organic vegetables and fruit	Local restaurant, local and regional consumers (LMA)	

The case is characterized by options and values involved in the different steps of the value chain. In fact, the BM has been designed through the combination of entrepreneur's personal values and options (e.g., ecological and environmental values) and sound management principles and rules. The entrepreneur's education in management is an important aspect of her approach to business and explains the development of complementary activities, like the workshops and fieldtrips, the local restaurant and the shop. In fact, the business revenues are stabilized by these multiple activities.

Therefore, the key elements of the new sustainable BM of this case are as follows:

- Land ownership.
- Local production combined with production from other Portuguese regions within informal and trust-based networks. These networks allow the delivery of products that are temporarily unavailable or not produced at Quinta do Oeste. In addition, they permit to share information, knowledge and encouragement.

- Seasonal products, allowing natural cycles and the environment (land, ecosystems, water) to be respected.
- The integration of different parts of the value chain under the same enterprise: production, transformation, commercialization, and consumption.
- The centrality of the web platforms, which allows them to offer consumers and the community a range of important services: registration as a customer, weekly orders of hampers, information on seasonal products (e.g., their life cycle, nutrients and importance to health), information about other activities at the farm (restaurant, cooking workshops).
- The multi-dimensionality of this case regarding the option for a sustainable business in the food system: economic (production, transformation, commercialization and consumption), environmental (organic production), and social (field trips and knowledge dissemination within a large community).

To sum up, integration and diversity are key words in this case, namely in terms of knowledge (old and new), communication tools (informal, web), sustainability goals (economic, social and environmental) and value chain components (production, transformation, commercialization, consumption). Based on these principles, the sustainability, economic and social dimensions of this experience have proved to be successful.

## 1.5 Conclusions

The analysis has shed light on the specificity of the food system. It is a territory-based system where new experiments to transform agricultural practices have to draw on both new and old knowledge. This is clearly illustrated by the Quinta do Oeste case study. The new business model draws on the new technological platforms to advertise and commercialize the farm's products and rejects the prevalent chemicals-intensive farming practices. This shift is driven by the quest for quality food and sustainable practices, but has also proved to be very successful in economic and social terms.

Quinta do Oeste has tackled the uneven competition – their products are more expensive than those of 'industrialized' agriculture – by developing a multifaceted strategy with distinct elements:

- 1) Participation in informal networks of organic farmers, consumers, associations, etc., to share knowledge, information and encouragement and to complete their offer.
- 2) Targeting a specific market segment that is very sensitive to food quality and sustainable farming practices rather than to food price.
- 3) Capture of a higher share of the value created through a sales scheme based on short supply chains (direct delivery, own shop and participation in farmers' markets).
- 4) Complementary activities, such as a restaurant and a shop in the farm complex and the organization of field trips and cooking workshops.

An important conclusion is that support from public agencies is relatively modest in this sector, unlike others. This issue will be developed in future research. In our view, it is only possible to speed up the food system transition with much stronger public commitment and a reorientation of current policies, incentives and regulations not only in relation to sustainable agri-production and commercialization, but also all kinds of unsustainable agri-food related activities.

In addition to identifying the need for a territorial based approach and greater public intervention, the case studied allowed us to identify other key aspects of the transition to more sustainable business models in the food sector. Firstly, critical reflection must take place on the theoretical frameworks available, in order to understand the dynamics of the transition pathway. In fact, and unlike sectors such as energy, the food system involves an enormous number of very diverse actors in terms of type, size and power. The specificity of the food system also entails the need to include the consumer side and societal values such as concern for the planet, health, and quality of life. This means that the research on transition pathways in this sector should develop new theoretical and methodological frameworks that suit the specificity of this critical dimension of social life.

A final conclusion is that agri-food transition requires an integrated solution encompassing innovative business models, the creation of sustainability-oriented technological innovation in conjunction with the recovery of ancient knowledge, a new generation of policies, and stronger public commitment.

The main limitation of this analysis is that it relies upon a single case study. Future research will compare several case studies, corresponding to different business models at different stages of the value-chain, in order to draw sounder conclusions that can be generalized. In addition, we will try to provide a theoretical contribution on the relationship between the sustainable business models approaches and the transition literature, taking into account the singularity of the food sector. Finally, we will analyse the adequacy of existing policies and formulate recommendations.

## References

- Barth, H., Ulvenblad, P. O., & Ulvenblad, P. (2017). Towards a conceptual framework of sustainable business model innovation in the agri-food sector: a systematic literature review. *Sustainability*, 9(9), 1620.
- Baumgartner, R. J., & Korhonen, J. (2010). Strategic thinking for sustainable development. *Sustainable Development*, 18(2), 71-75.
- Beuchelt, T., & Zeller, M. (2012). The role of cooperative business models for the success of smallholder coffee certification in Nicaragua: A comparison of conventional, organic and organic-fairtrade certified cooperative. *Renewable Agriculture and Food Systems*, 28(3), 195-211.
- Bocken, N. M., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, 42-56.
- Boons, F., & Lüdeke-Freund, F. (2013). Business models for sustainable innovation: state-of-the-art and steps towards a research agenda. *Journal of Cleaner Production*, 45, 9-19.
- Broman, G. I., & Robèrt, K. H. (2017). A framework for strategic sustainable development. *Journal of Cleaner Production*, 140, 17-31.

- Brunori, G., Barjolle, D., Dockes, A. C., Helmle, S., Ingram, J., Klerkx, L., & Tisenkopfs, T. (2013). CAP reform and innovation: the role of learning and innovation networks. *Eurochoices*, 12(2), 27-33.
- Bui, S., Cardona, A., Lamine, C., & Cerf, M. (2016). Sustainability transitions: Insights on processes of niche-regime interaction and regime reconfiguration in agri-food systems. *Journal of Rural Studies*, 48, 92-103.
- Cagliano, R., Worley C. G., & Caniato, F. F. (2016). The challenge of sustainable innovation in agri-food supply chains. In R. Cagliano, F. F. Caniato, & V. G. Worley (Eds.), *Organizing supply chain processes for sustainable innovation in the agri-food industry*. Emerald Group Publishing Limited.
- Cohen, N. & Ilieva, R.T. (2015). Transitioning the food system: A strategic practice management approach for cities. *Environmental Innovation and Societal Transitions*, 17, 199-217.
- França, C.L., Broman, G., Robèrt, K.H., Basile, G., & Trygg, L. (2017). An approach to business model innovation and design for strategic sustainable development. *Journal of Cleaner Production*, 140, 155-166.
- Fritz, M., & Matopoulos, A. (2008). Sustainability in the agri-food industry: a literature review and overview of current trends. In *Proceedings of the 8th International Conference on Management in Agri-Food Chains and Networks*.
- Geels, F.W., Sovacool, B.K., Schwanen, T., & Sorrell, S. (2017). The socio-technical dynamics of low-carbon transitions. *Joule*, 1(3), 463-479.
- Green, K., Harvey, M., & Mcmeekin, A. (2003). Transformations in food consumption and production systems. *Journal of Environmental Policy & Planning*, 5(2), 145-163.
- Hinrichs, C. C. (2014). Transitions to sustainability: a change in thinking about food systems change? *Agriculture and Human Values*, 31(1), 143-155.
- Ingram, J., Maye, D., Kirwan, J., Curry, N. & Kubinakova, K. (2015). Interactions between niche and regime: an analysis of learning and innovation networks for sustainable agriculture across Europe. *The Journal of Agricultural Education and Extension*, 21(1), 55-71.
- Karlsson, N. P., Hoveskog, M., Halila, F. & Mattsson, M. (2018). Early phases of the business model innovation process for sustainability: Addressing the status quo of a Swedish biogas-producing farm cooperative. *Journal of Cleaner Production*, 172, 2759-2772.
- Kurucz, E.C., Colbert, B.A., Luedeke-Freund, F., Upward, A., & Willard, B. (2017). Relational leadership for strategic sustainability: practices and capabilities to advance the design and assessment of sustainable business models. *Journal of Cleaner Production*, 140, 189-204.
- Markard, J., Raven, R., & Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. *Research Policy*, 41(6), 955-967.
- Markowska, M., Saemundsson, R. J., & Wiklund (2011). Contextualizing business model developments in Nordic rural gourmet restaurants. In G. Alsos, S. Carter, & E. Ljunggren (Eds.), *Handbook of research on entrepreneurship in agriculture and rural development* (pp.162-179). Cheltenham, UK. Edward Elgar.
- Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*. John Wiley & Sons.
- Popkin, B. M. (2017). Relationship between shifts in food system dynamics and acceleration of the global nutrition transition. *Nutrition Reviews*, 75(2), 73-82.
- Rivera, M., Knickel, K., de los Rios, I., Ashkenazy, A., Pears, D. Q., Chebach, T., & Šūmane, S. (2018). Rethinking the connections between agricultural change and rural prosperity: A discussion of insights derived from case studies in seven countries. *Journal of Rural Studies*, 59, 242-251.
- Rohrbeck, R., Konnertz, L., & Knab, S. (2013). Collaborative business modelling for systemic and sustainability innovations. *International journal of technology management*, 63(1/2), 4-23.
- Rosca, E., Arnold, M., & Bendul, J.C. (2017). Business models for sustainable innovation—an empirical analysis of frugal products and services. *Journal of Cleaner Production*, 162, S133-S145.

- Sengers, F., Wiczorek, A. J., & Raven, R. (2016). Experimenting for sustainability transitions: A systematic literature review. *Technological Forecasting and Social Change*. Available online.
- Seyfang, G. (2006). Ecological citizenship and sustainable consumption: Examining local organic food networks. *Journal of Rural Studies*, 22(4), 383-395.
- Stubbs, W., & Cocklin, C. (2008). Conceptualizing a “sustainability business model”. *Organization & Environment*, 21(2), 103-127.
- Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, 43(2-3), 172-194.
- Tell, J., Hoveskog, M., Ulvenblad, P., Ulvenblad, P. O., Barth, H., & Ståhl, J. (2016). Business model innovation in the agri-food sector: A literature review. *British Food Journal*, 118(6), 1462-1476.
- Tibbs, H. (2011). Changing cultural values and the transition to sustainability. *Journal of Futures Studies*, 15(3), 13-32.
- Ulvenblad, P., Barth, H., Björklund, J. C., Hoveskog, M., Ulvenblad, P. O., & Ståhl, J. (2018). Barriers to business model innovation in the agri-food industry: A systematic literature review. *Outlook on Agriculture*, 47(4), 308-314.
- Ulvenblad, P., Hoveskog, M., Tell, J., Ulvenblad, P. O., Ståhl, J., & Barth, H. (2014). Agricultural business model innovation in Swedish food production: the influence of self-leadership and lean innovation. In *DRUID Society Conference 2014 on Entrepreneurship–Organization–Innovation*, Copenhagen Business School (CBS), Copenhagen, Denmark, June 16-18, 2014.
- Ulvenblad, P. O., Ulvenblad, P., & Tell, J. (2019). An overview of sustainable business models for innovation in Swedish agri-food production. *Journal of Integrative Environmental Sciences*, 16(1), 1-22.
- Upward, A., & Jones, P. (2016). An ontology for strongly sustainable business models: Defining an enterprise framework compatible with natural and social science. *Organization & Environment*, 29(1), 97-123.
- Wilson, G. A. (2008). From ‘weak’ to ‘strong’ multifunctionality: Conceptualising farm-level multifunctional transitional pathways, *Journal of Rural Studies*, 24, 367-383.