Innovation & Management Review
ISSN: 2515-8961
revistarai@usp.br
Universidade de São Paulo
Brasil

Prado Schiavon, Olívia; Ramos May, Márcia; Torres Barros Batinga de Mendonça, Andréa
Dynamic capabilities and business model innovation in sustainable family farming
Innovation & Management Review, vol. 19, núm. 3, 2022, Julio-Septiembre, pp. 252-265
Universidade de São Paulo
São Paulo, Brasil

Received 28 July 2021
Revised 5 October 2021
4 November 2021
Accepted 4 November 2021

Dynamic capabilities and business model innovation in sustainable family farming

Olívia Prado Schiavon, Márcia Ramos May and Andréa Torres Barros Batinga de Mendonça
Graduate Program in Administration, Federal University of Parana, Curitiba, Brazil

Abstract

Purpose – The study aims to understand how dynamic capabilities (DCs) contribute to business model innovation (BMI) in sustainable family farming. The agrifood sector has been seeking solutions for the development of agroecological markets. Thus, the authors have analyzed the challenges imposed to innovation and sustainability strategic management and the value proposition to sustain the business over the years.

Design/methodology/approach – Considering the complexity of organizations and through an exploratory multiple case study of initiatives identified in the Organic Fair of Curitiba's Passeio Público, it was possible to analyze the evolution of the business models (BMs) and the fair itself. Furthermore, it was possible to identify the DCs within the influence of agroecosystem elements on the innovation development.

Findings – Analyzing each case individually, the authors understood the different dimensions of the evolution of BMs considering the organizational complexity. The authors conclude that the balance between organizational practices and changes in the environment, engagement and learning plays a significant role in the developing competitive advantage. The same applies to the patterns that precede the development of DCs and BMs.

Originality/value – The article investigates innovation in agroecological BMs from a dynamic capability perspective. The agroecological BM is a subject that is still little discussed in the literature. In addition, the authors chose a context that includes socioenvironmental aspects and a few specificities of family farming in Brazil.

Keywords Dynamic capabilities, Business model innovation, Agroecology, Sustainable development

Paper type Case study

1. Introduction

The evolution of the concept of dynamic capabilities (DCs) brings different understandings about the fundaments of strategy related to the development of capabilities (Teece, 2019). Specific capabilities related to the dynamism and the heterogeneity of the business environment keep pace with changes, adapting and renewing themselves through the development of processes, practices, routines and abilities (Adner & Helfat, 2003; Teece, 2007, 2019).

As the research evolved, the different dynamics or market changes started encompassing the different contexts in which organizations operate (Hermann, Sangalli, & Teece, 2017; Makkonen, Pohjola, Olkkonen, & Koponen, 2014; Teece, 2016).

Funding: This research study was funded by the National Council for Scientific and Technological Development (CNPq).

Innovation & Management Review
Vol. 19 No. 3, 2022
pp. 252-265
Emerald Publishing Limited
2515-8961
DOI 10.1108/INMR-07-2021-0136

However, DC studies have contributed to analyzing the development of strategies related explicitly to technological innovations and rapidly changing environments, absorptive capacity, knowledge management and information technology (Cheah, Ho, & Li, 2018; Santoro & Usai, 2018; Schweisfurth & Raasch, 2018).

Several scholars have started developing organizational innovations and DC studies simultaneously. Being so research focused on business models (BMs) has been responsible for developing tools and models through the strategic design of creation, delivery and capture of value. Such research also analyzes the evolution of BMs (Mezger, 2014; Teece, 2018).

Additionally, recent studies have been trying to interrelate DCs with sustainable development and corporate sustainability. However, such studies are still focused on high-tech contexts (Acquier, Carbone, & Acosta, 2019; Mousavi, Bossink, & van Vliet, 2019).

Scholars have been drawing attention to changes in the dimensions of sustainable BMs in different contexts (Evans *et al.*, 2017; Muñoz, Niederle, Gennaro, & Roselli, 2021; Topleva & Prokopov, 2020). A few studies point out the importance of innovation as a motivating factor for developing and leveraging sustainable agricultural businesses (Viciunaite & Alfnes, 2020; Vitari & David, 2017). They also emphasize the need to develop capabilities to advance further management abilities and market opportunities (Côte *et al.*, 2019).

However, most innovation and strategy studies focus on agribusiness and food industries. Family farming initiatives and micro- and small business owners' actions are still little addressed, despite their essential role in the sustainable or agroecological food value chain (Loconto, Jimenez, & Vandecandelaere, 2018; Loconto & Fouilleux, 2019).

For 40 years, Brazilian family farming has developed towards organic production and agroecological aspects (Costa, Souza, Müller, Comin, & Lovato, 2017). This fact leads us to question how these different agroecological initiatives in Brazil have evolved over the years and sustained themselves in the market.

Thus, this study intends to answer the following research question: *How DCs contribute to business model innovation (BMI) in sustainable family farming?*

Due to the exploratory nature of this study and considering the development of the research protocol, we propose the following specific research questions (Creswell, 2014; Yin, 2014):

Q1. Why have agroecological BMs changed over the years? How can modifications in the components of the BM be considered innovations?

Q2. How can DCs be characterized? Furthermore, how do these capabilities contribute to innovation in agroecological BMs?

We have developed this study over the following sections to answer these research questions.

2. Literature review

2.1 Dynamic capabilities

Changes and uncertainty in business environments have been analyzed in rapidly changing environments – such as technological innovation – and political, economic and social development (Hermann *et al.*, 2017). Debates and studies on sustainable development, corporate social responsibility and paradigms of the 21st century, for example, have been changing the way organizations develop their strategies and capabilities before new dynamics (Acquier *et al.*, 2019; Teece, 2019).

To face changes and uncertainties inherent in societies and BMs, experts have developed the DC theory to reach out new forms of competitive advantage. They based such DCs on "dynamics" and "capability" linked to the leading role of strategic management (Teece, Pisano, & Shuen, 1997).

Moreover, DCs are part of specific organizations that adapt, integrate and redesign themselves. They also combine competencies and resources to identify and seize opportunities through processes and routines, meeting market dynamics (Teece *et al.*, 1997).

We have adopted the conceptual and theoretical definition developed by Teece *et al.* (1997) and the concepts of micro-foundations added in Teece (2007). Moving forward, we bring Teece's perspective (2018) that approaches how the DC development can allow a business to update its resources and guide them through development and coordination.

The micro-foundations are constituted by (1) sense, the capability to identify and configure opportunities and threats of the organizational macro- and micro-environment; (2) seize, the capability to capture or seize opportunities through the BM design and the assignment of resources; and (3) reconfigure or transform, the capability of remaining competitive by improving, combining, protecting, reconfiguring or transforming tangible and intangible assets (Fallon-byrne & Harney, 2017; Teece, 2007, 2018).

After two decades of studies, there is a need to review the fundamental contributions to DC theory, such as its implications in different organizational and management contexts (Albort-morant, Leal-rodríguez, Fernández-rodríguez, & Ariza-montes, 2018). Furthermore, it has also emerged studies in sustainability and sustainable development (Acquier *et al.*, 2019; Pieroni, Mcaloone, & Pigosso, 2019). These studies aim to understand the relationships between these concepts with innovation (Mousavi *et al.*, 2019), the different categories of capabilities, networks and supply chains (Raza *et al.*, 2021).

In short, the progress of these studies emphasizes the importance of identifying and understanding the different DC configurations and the allocations of resources in different sectors, markets and contexts. Thus, the theoretical relationships with organizational practice will be expanded (Albort-morant *et al.*, 2018; Teece, 2019).

2.2 Business model innovation

Strategy, innovation and sustainability studies have been using the BMs' tools to understand the dynamics of organizational elements. Such dynamics are necessary for changes given the society's transformations (Bashir & Farooq, 2019; Sarasini & Linder, 2018).

Scholars have been guiding the business model study in three perspectives: technology, organizational theory and strategy (Wirtz, Pistoia, Ullrich, & Göttel, 2016). Those different perspectives and definitions have drawn the attention of Wirtz *et al.* (2016) who outlined a model that includes the innovation search and the BMs' evolution over time. They managed to converge models by integrating BM's concepts, foundations and components based on a dynamic business perspective.

The integrative model proposed by the authors shows an analytical range of archetypes from different studies, perspectives and visions, going beyond the notion of business modeling tools (Wirtz *et al.*, 2016).

Thus, the conceptual definition of their study considers BM those that represent, in a simple and associated way, the relevant activities of an organization. The BMs would show these relevant activities by describing the information and informing how marketable products or services are generated (Wirtz *et al.*, 2016).

The integrative model comprises strategic, customer, market and value creation components (Wirtz *et al.*, 2016). Each component has specific areas and administrative scopes, which alludes to the strategic design of organizational processes, activities and resources (Wirtz *et al.*, 2016).

The innovation in the value components of a BM takes place to push boundaries by applying innovative ideas and technologies in already established BMs. Hence, the authors suggest that seek technological and nontechnological knowledge, enabling value capture through the development of innovation, new revenue streams and cost structures (Cheah *et al.*, 2018; Henry Chesbrough, 2010).

The conceptual framework of BMI we have chosen for this paper aligns with other studies. It comprises macro-dimensions – globalization, technology, industry and market changes – and micro-dimensions – changing customer needs, product/service innovation, competition and firm dynamics (Wirtz & Daiser, 2017). The researchers link these dimensions to innovation development, both in the BM components and its processes (Wirtz & Daiser, 2017).

We have based these choices on a holistic model that supports understanding the strategic structure and organizational value. Such a model helps visualize these different dimensions, which interact with organizations, internally and externally, expanding the view of the phenomenon and converging with this study's epistemological perspective (Tsoukas, 2017).

The broad discussion on the BM covers the organizational phenomena. These organizational phenomena deal with the complexity of economic, social and environmental elements integrated into innovation processes in their value chains and BM dimensions (Bocken, Boons, & Baldassarre, 2019; Evans *et al.*, 2017; Lewandowski, 2016).

Thus, Loconto *et al.* (2018) propose a BM as a conceptual basis to bring together agroecological and sustainable development elements. Therefore, such a BM offers the necessary support for the construction of the present study. The focus of our study relies on the development of agroecological markets. The model by Loconto *et al.* (2018) encompasses participation, transparency, communication, integrity, governance, financial autonomy and natural resources efficiency.

2.3 Family farming and agroecology

Agroecology is the field that aims at studying innovative forms and techniques of ecologically based agriculture and its importance in restructuring agricultural practices towards sustainability (Niederle, Almeida, & Vezzani, 2013). As a new paradigm, agroecology replaces or converts conventional or industrial forms of production (Gliessman, 2016). Such a paradigm help understand how the factors and dimensions of the agrifood system are relate to each another and how they seek to overcome challenges, problems and impacts caused by conventional agriculture (El Bilali, 2019; Gliessman & Rosemeyer, 2010; Nasiri, Rantala, Saunila, Ukko, & Rantanen, 2018; Plumecocq *et al.*, 2018).

The development of organic agroecological production and family farming has boosted the emergence of market channels. These new market channels have characteristics such as the diversity of players, channels and initiatives (Loconto *et al.*, 2018). The development of agroecological production has also boosted the emergence of new agricultural methods and techniques: organic agriculture, development of agricultural ecosystems designed to be sustainable and self-sufficient (permaculture), and a kind of agriculture that incorporates tree growing and conservation (agroforestry) (Gliessman & Rosemeyer, 2010; Vitari & David, 2017).

Moreover, family farming plays a relevant role in agroecological development as an essential part of the agrifood supply chain in Brazil (Niederle *et al.*, 2013). However, the country presents a few conflicts and challenges for agroecological initiatives and theoretical–empirical approaches since a few essential elements still lack development in the domestic market (Muñoz *et al.*, 2021).

Amongst the challenges, we can mention the multidimensional viability (social, economic, environmental and cultural), the coordination of different marketing strategies, the necessary organizational configuration (Muñoz *et al.*, 2021) and the challenges related to market access and competitiveness (Loconto *et al.*, 2018).

In this regard, our goal is to research the value proposition of agroecological businesses, their particularities, elements and challenges related to new models of strategic evolution in a dynamic market context.

3. Methodological procedures

We have based this study on Tsoukas (2017), who aims to study the theoretical organizational development and management considering the phenomena complexities. Our research is exploratory as the constructs are perspectives under development in the organizational field. In addition, we will provide a detailed description of the organizational phenomenon (Creswell, 2014). We based the procedures on a structured protocol according to Yin (2014) (see Figure 1).

We selected the cases based on orientations found in the literature, which points out the analytical benefits of such a methodological category, in line with this study's comprehensive approach (Eisenhardt, 1989; Yin, 2014). Thus, the choice of the cases followed the indications of Yin (2014); we delimited companies according to their lifespan, and after a discussion with peers, we established a minimum of ten years. Considering that changes in BMs evolve (Haas, 2018) and that the development of DC also changes over time (Teece, 2019), we considered it necessary to establish a minimum organizational trajectory.

We have made the first contact with one of the founding stallholders. Then we asked this first contact to indicate other pioneer stallholders; we have chosen for this study only those that fit the case selection protocol (Yin, 2014). The delimitations and indications led to two case studies, which we have chosen based on the concept of theoretical saturation (Eisenhardt, 1989):

(1) *Case A*: Recanto Nativo; city of origin: Campo Magro. It is operating for approximately 30 years, and two owners were interviewed (E1 and E2).

(2) *Case B*: Celeiro Vieira; city of origin: Almirante Tamandaré. It is operating for about 19 years considering the years before the transition from conventional to organic agriculture, and two of the owners were interviewed (E3 and E4).

We have chosen these family farming initiatives – production and trading of selected organic products in the metropolitan region of Curitiba – due to their representativeness in the sector (Paraná, 2020; Vilela, Mangabeira, Magalhães, & Tôsto, 2019). In addition, we highlight the pioneering spirit and longevity of these initiatives in the Organic Fair of Curitiba's Passeio

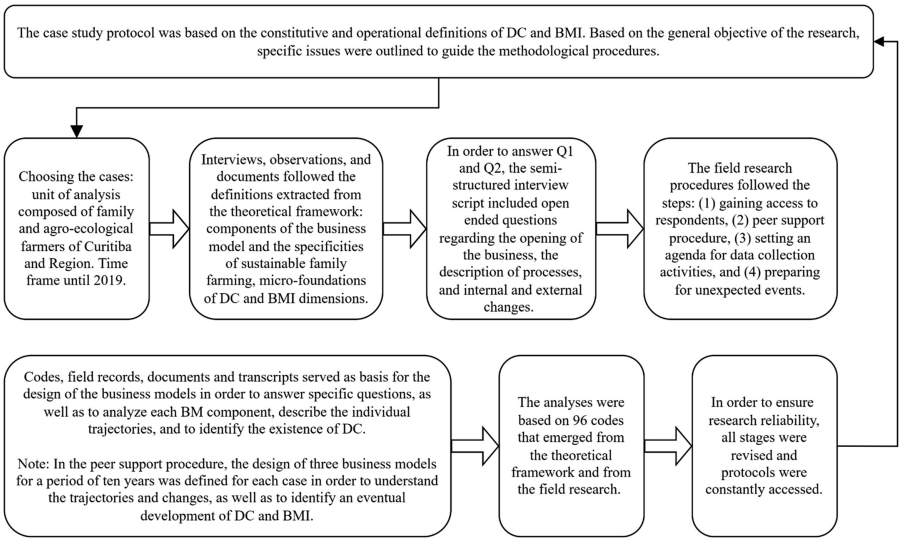

Figure 1.
Methodological procedures

Público since they have accompanied the development of the agroecological movement and market in Brazil (Paraná, 2020).

We have based the data collection on the triangulation principle of sources, including interviews, additional documents and observation. We began the collection with observations at the organic fair to contextualize the research field.

The collection and analysis protocols relied on the recommendations of Ruane (2005), thus enabling us to carry out

(1) long-term observations in specific places (two months of observation in the Organic Fair of Passeio Público – Saturdays from 7 am to 12 pm and, when possible, visits to production sites),

(2) informal conversations with specific individuals (customers and stallholders; all questions based on the interview script used with producers),

(3) notes and field reports and

(4) the organization of observation files, documents and interviews according to each case or location.

We also conducted semi-structured interviews. The interviewees were the owners themselves or the children and collaborators of family farmers, who had participated in the entire process or knew about the history of sustainable agricultural production. We transcribed the interviews using the Express Scribe software, version 5.78.

In addition, we have analyzed secondary data available in the media (Fielding, 2017), namely

(1) articles on newspaper and magazine websites,

(2) company websites,

(3) social media,

(4) Passeio Público's Organic Fair on social networks,

(5) documents provided by research institutions,

(6) research and information provided by IDR-Paraná (Institute of Rural Development of Paraná) and

(7) other documents, stories and videos available on the institutions' websites (e.g. Kawakami, 2016; Sambuichi *et al.*, 2017; Vilela *et al.*, 2019).

For the content analysis, we have chosen an analytical technique (Cooper & Schindler, 2014). This technique included data coding using the Atlas.ti software to extract the patterns, codes, concepts and contexts.

The data coding followed the coding cycles of Saldaña (2016), who proposes a robust analysis of codes in a cyclical view. We conducted the first coding stage based on theoretical propositions and inferred codes from the literature, and then we identified 50 structural and conceptual codes. For such, we defined the following sequence of methods: (1) in the first cycle, we performed basic methods by reading and reviewing articles; (2) after the first cycle, we revised each data and code; we also analyzed the elemental codes that emerged during the field research, resulting in 96 codes; (3) we opted for the codification of patterns to group the codes into categories, themes and concepts; and (4) after the second cycle we revised the system and verified the codes to proceed with the cross-analysis of the cases, finally enabling us to create a diagram (Saldaña, 2016) (see Figure 2).

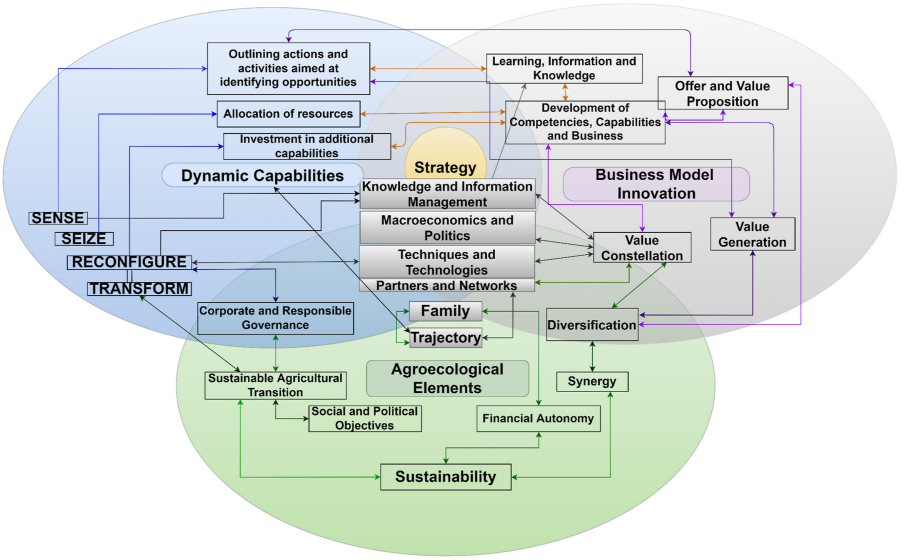

Figure 2.
Systematization of codes and interconnection between constructs

Subsequently, we carried out the design and analysis of each BM based on the codified and collected data. We have accomplished it considering the opportunity of analytical and conceptual use of the business model and the BMI process of the models analyzed (Barreto, 2010; Wirtz & Daiser, 2017).

Finally, we systematically and comparatively analyzed both cases through the analytical strategy of logical models and the synthesis of cross-data (Yin, 2014). We based the analyses on the research questions presented in the introduction of this paper.

3.1 Business model innovation in sustainable family farming

According to *Q1: Why have agroecological BMs changed over the years? How can modifications in the components of the BM be considered innovations?* It was possible to identify different changes in the internal and external environments of the initiatives that boosted changes in the business model. In both cases analyzed, the BM was considered an innovation in the local market, resulting in new forms of creating, offering and capturing value (Foss & Saebi, 2017; Teece, 2018; Wirtz & Daiser, 2017).

The trajectory of both cases indicates that all activities, processes and routines adapted to the market needs and have brought stability over the years. Nevertheless, it stood out a few aspects related to value generation – represented by the pioneering spirit of Case A – and the differentiation in production and financial model – represented by Case B.

We identified changes essentially in the core dimensions of BM value creation. These changes influenced the strategic model of each case (Wirtz *et al.*, 2016; Wirtz & Daiser, 2017). These influences ended up reflecting on the development of conventional and subsistence agricultural businesses for the production and trading of agroecological products.

In addition to being a pioneer, Case A stood out for its engagement, improvement of knowledge, increase of information, relationship processes, efficient exploration, different combinations of resources and competencies. Agroecological producers also sought to diversify their activities. They have diversified through agri-business, rural tourism and the

establishment of restaurants, carrying out the necessary adaptations and reforms to meet the needs of the new activities, as reported by the owners:

> We have expanded a lot [. . .] a big range, right [. . .] (inaudible) [. . .] agribusiness. . . and the fair [. . .] [E2].

> It was a way of bringing in customers [. . .] because there was no customer [. . .] so in Germany they had a different system [. . .] delivery [. . .] for the customer to buy on the property [. . .] my dream was to make the same so that the customer could come here [. . .] and I reached this goal [. . .] but it was expensive for us [. . .] the customer comes here [. . .] the competition out there is big [. . .] so the customer wouldn't come here just to pick vegetables [. . .] we had to have other sources [. . .] for the customer to come [. . .] so I had to think of other alternatives too [. . .] [E1].

Moreover, in Case A, one of the BMI reports that drew attention was the emergence of a "family spin-off," transforming a specific activity into an independent business. This "family spin-off" assumed the responsibility to run the business (Chesbrough & Rosenbloom, 2002; Giudice, Rosaria, Peruta, & Maggioni, 2013; Lozano, 2017). Based on her parent's successful trajectory, the producer's daughter identified the opportunity to start her own online organic basket business.

In Case B, the perceptions and use of opportunities that have arisen for the agribusiness development stood out. In addition, the access to different competencies developed throughout the years and understanding resource limitations were relevant factors identified in Case B. The interviewees reported that the construction of the agroindustry took place gradually as they identified opportunities for acquiring resources, developed construction skills and adapted to the market's new needs.

Furthermore, during the business development, the owners of the Case B business demonstrated a different view before barriers and limitations, such as those related to the law and regulations. Trying to expand and diversify their business, the owners developed a production and trading model that relied on partnerships among rural properties belonging to different family members of both owners. Farmers manage such partnerships and entail registered contracts.

The owners showed to possess particular competencies such as the search for problems solutions, the constant realignment and the improvement of critical activities and processes. They also exceeded themselves when they showed organizational governance capabilities, highlighted in the analysis of the reconfiguration and transformation of the business (Fallon-byrne & Harney, 2017; Teece, 2007; Zott & Amit, 2007).

Finally, we emphasize the development of previous activities in both trajectories leading to constant maintenance and improvement. The development of DCs was highly improved. The BMI: family trajectory, management of the partnership network and access to information and knowledge.

3.2 Dynamic capabilities and business model innovation

The analysis of *Q2: How can DCs be characterized?* Furthermore, *how do these capabilities contribute to innovation in agroecological BMs?* It led us to a few interesting outcomes. The micro-foundations of DCs and the selected BM's analysis showed which macro- and/or micro-organizational changes influenced the development of competencies, abilities, processes and practices of organizational dynamics.

The authors identified the establishment of a partnership network when they analyzed sense, based on the identification, learning and selection of opportunities, in addition to the recognition of barriers, challenges and uncertainties (Fallon-byrne & Harney, 2017; Teece, 2007). Thus, the partnership network shares information and knowledge, supports and engages all the actors involved in the process.

These relationships could be identified both in the reports provided by the farmers and in the documents analyzed. Likewise, the investigation led to the identification of other essential items, such as opportunities and barriers arising from public policies, support for networks and activities, regulation and certification, the emergence of issues related to food security and inequality, challenges in the organization of the production systems and barriers from price market to communication (Kawakami, 2016; Sambuichi *et al.*, 2017; Vilela *et al.*, 2019).

Farmers demonstrated engagement by participating in courses, events and political debates. The network of farmers enabled a more profound knowledge of the market and the involvement in the construction and development of the agroecological market in the region (Vilela *et al.*, 2019). These findings corroborate Teece (2018) as the development of these specific capabilities occurred gradually and through nonroutine managerial interventions (Teece, 2018).

The author identified the seize activities frequently in the trajectories reported by the farmers in both cases. In other words, they were seizing opportunities, allocating resources and outlining the evolution of BMs (Teece, 2018; Wirtz *et al.*, 2016). According to E1's report,

> [. . .] that is where rural tourism is born and I get into the [. . .] food business with the restaurant [. . .] [. . .] then we set up a grass kiosk here [. . .] we have some photos [. . .] where there used to be a simple wooden kitchen [. . .] so that we can cook for everyone [. . .] for the people that used to visit. . . that is where tourism was born [. . .] rural tourism [. . .] the agri-food line [. . .] food, right [. . .] but when we already founded the organic agriculture [. . .] when there was tomatoes left [. . .] as I am the granddaughter of Italians too [. . .] I already knew how to make sauce [. . .] [. . .] I made a lot of things that grandma taught me [. . .].

Concurrently with their business evolution, the farmers build reconfiguration activities and skills, such as transforming the business model (Teece, 2007, 2018). Therefore, they were able to develop and apply the knowledge acquired over the years and governance and management activities to adapt organizational structures to the emerging changes in the agroecological market. As shown in E4's report,

> [. . .] I made my shed with this material [. . .] the boys and I [. . .] we didn't have to pay anyone to make it [. . .] we took the stands and put it in [. . .] we built the kitchen ourselves [. . .] of course later I had to hire a mason due to the flooring [. . .] but the shed we built ourselves for the agribusiness.

The selection of decision-making protocols is among the activities related to the DC. Subject-known experts make such decisions based on the owners' expertise or collaborative activities with business partners as they emerge (Teece, 2007, 2018).

Finally, it was possible to visualize and describe the changes that occurred throughout the years by outlining each BM based on the creation, delivery and value capture. It was also possible to identify standards and elements that emerged from the data triangulation, namely

(1) *macro-environmental dimensions:* macroeconomics and politics; regulation; access to research, new techniques and technologies; changes in the inter(national) market; seasonality, soil-related problems;

(2) *micro-organizational dimensions:* changes in consumption patterns; adequacy of agricultural structure and sustainability; availability of rural workers; family trajectory; relationship with the actor's network; changes in competitiveness and collaboration.

The dimensions identified corroborate the existing literature on agroecological markets. Such dimensions also involved essential issues for the debate on sustainable development, especially regarding rural environment and sustainable family farming (Loconto & Fouilleux, 2019; Loconto *et al.*, 2018; UN, 2015).

Based on such dimensions, it was possible to identify the BMI and the DCs development. Both aspects – BMI and DC – are interconnected with organizational transformation. The organizational transformation traces the business development since its configuration and reconfiguration through strategies, actions and continuous creation, combination and refining (Foss & Saebi, 2017; Teece, 2007, 2018).

Both cases have undergone transformations as they came from a conventional production system (Gliessman & Rosemeyer, 2010; Mckay & Nehring, 2014). After acknowledging the opportunity and the need for sustainable agricultural transformation, both companies started developing the DCs. We emphasize here some of these capabilities: relationships, capturing information and knowledge, developing partnerships and networks, applying techniques and knowledge, diversifying products and services, and the continuous search for family development and growth in rural areas (Vilela *et al.*, 2019).

Furthermore, themes related to the family trajectory, previous knowledge and experiences with agricultural production from generation to generation emerged in the field. We can compare such findings to the path dependence concept approached by Teece *et al.* (1997). They affirm that such a concept acknowledges the importance of history and the complexity of organizations.

Such complexity presents itself in the development of the businesses that presented BMI. It demonstrated the improvement of activities and actions related to different macro and micro environmental factors. We have identified such heterogeneous characteristics in developing DCs (Teece, 2007) and in the BMI process (Wirtz & Daiser, 2017).

The specificities of the agroecological context interact with strategic models and concepts, showing that adaptation to the different realities and markets is necessary. The innovations found in agroecological businesses differ from those found in high-tech environments. Nonetheless, they show the existence of different possibilities of strategic and economic development, even before a context of changes and uncertainties.

4. Discussion and conclusion

This article has discussed how DCs contribute to BMI in sustainable family farming. We verified the existence of DCs and their contribution to BMI in both analyzed cases. The improvement and constant access to the competencies developed over time, interconnected with the contingencies of the internal and external organizational environment, have contributed to the design and refinement of the business model and its reconfiguration or transformation (Teece, 2018; Teece *et al.*, 1997; Wirtz *et al.*, 2016; Wirtz & Daiser, 2017).

The cases presented herein demonstrated that innovative development was responsible for guiding their building activities, the dynamics of networks and partnerships and knowledge and information management activities. Innovative development generates significant changes in the cases value configuration. Furthermore, the engagement of producers and the synergy of activities contributed to the success of these businesses (Loconto *et al.*, 2018). We also concluded that building a network of relationships is a precedent for BMI.

Amongst the contributions of this study, we mention the identification of precedents for the development of DC and BMI, showing their direct relationship with context-dependent issues and business trajectory. Understanding the complexity and specificity of each phenomenon is essential to analyze such constructs. In addition, these precedents followed the cases throughout their organizational development, outlining their evolution in the market.

Considering the comprehensive view and the business complexity, we can say that this study contributes to the theory of scientific knowledge. It considers the performance and

interaction of actors simultaneously, thus enabling a detailed analysis of market dynamics, relationships built and reported trajectories.

Based on this article analysis, we suggest the following practical recommendations:

(1) developing participatory and joint activities with other farmers and partners and

(2) developing participative and joint activities with public and private research agencies, since such agencies are essential for economic development.

We also observed that administrative processes, routines and activities improve management and business relationships with networks. These aspects influenced the business's survival and the agroecological market analyzed herein.

Finally, we suggest that future studies analyze separately each component and dimension of the BMs in different contexts considering significant changes, such as those caused by the COVID-19 pandemic. We still suggest the in-depth investigation of agency and governance aspects and the relationship among actors of the agroecosystem in the global south.

References

Acquier, A., Carbone, V., & Acosta, P. (2019). Dynamic capabilities for sustainable innovation: What are they?., *et al.* (Eds.), In *Business Strategies for Sustainability Business* (pp. 198–217). New York, NY: Routledge.

Adner, R., & Helfat, C.E. (2003). Corporate effects and dynamic managerial capabilities. *Strategic Management Journal*, *24*(10 SPEC ISS.), 1011–1025, doi: 10.1002/smj.331.

Albort-morant, G., Leal-rodríguez, A.L., Fernández-rodríguez, V., & Ariza-montes, A. (2018). Assessing the origins, evolution and prospects of the literature on dynamic capabilities: A bibliometric analysis. *European Research on Management and Business Economics*, *24*(1), 42–52, doi: 10.1016/j.iedeen.2017.06.004.

Barreto, I. (2010). Dynamic capabilities : A review of past research. *Journal of Management*, *36*(1), 256–280, doi: 10.1177/0149206309350776.

Bashir, M., & Farooq, R. (2019). The synergetic effect of knowledge management and business model innovation on firm competence: A systematic review. *International Journal of Innovation Science*, *11*(3), 362–387, doi: 10.1108/IJIS-10-2018-0103.

Bocken, N., Boons, F., & Baldassarre, B. (2019). Sustainable business model experimentation by understanding ecologies of business models. *Journal of Cleaner Production*, *208*, 1498–1512, doi: 10.1016/j.jclepro.2018.10.159.

Cheah, S., Ho, Y., & Li, S. (2018). Business model innovation for sustainable performance in retail and hospitality industries. *Sustainability*, *10*(3952), 1–14, doi: 10.3390/su10113952.

Chesbrough, H. (2010). Business model innovation : Opportunities and barriers. *Long Range Planning*, *43*(2–3), 354–363, doi: 10.1016/j.lrp.2009.07.010.

Chesbrough, H., & Rosenbloom, R. (2002). The role of the business model in capturing value from innovation: Evidence from xerox corporation's. *Technology Spin-Off Companies, Industrial and Corporate Change*, *11*(3), 529–555, doi: 10.1093/icc/11.3.529.

Côte, F.-X., Poirier-Magona, E., Perret, S., Rapidel, B., Roudier, P., & Thirion, M. -C. (2019). *The agroecological transition of agricultural systems in the Global South. Versailles, Éditions Quæ*, doi: 10.35690/978-2-7592-3057-0.

Cooper, R. D., & Schindler, S. P. (2014). In *Business Research Methods* (12th ed.). New York, NY: McGraw-Hill Irwin.

Costa, M. B. B. da, Souza, M., Müller, V. J., Comin, J. J., & Lovato, P. E. (2017). Agroecology and sustainable food systems agroecology development in Brazil between 1970 and 2015.

Agroecology and Sustainable Food Systems, *41*(3–4), 276–295, doi: 10.1080/21683565.2017.1285382.

Creswell, J. W. (2014). In *Research Design: Qualitative, Quantitative and Mixed Methods Approach* (4th ed.). Thousand Oaks, CA: Sage Publications.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, *14*(1), 57–74. https://www.jstor.org/stable/3094429.

El Bilali, H. (2019). Research on agro-food sustainability transitions: Where are food security and nutrition?. *Food Security*, *11*(3), 559–577, doi: 10.1007/s12571-019-00922-1.

Evans, S., Vladimirova, D., Holgado, M., Fossen, K. V., Yang, M., Silva, E. A., & Barlow, C. Y. (2017). Business model innovation for sustainability: Towards a unified perspective for creation of sustainable business models. *Business Strategy and the Environment*, *26*(5), 597–608, doi: 10.1002/bse.1939.

Fallon-byrne, L., & Harney, B. (2017). Microfoundations of dynamic capabilities for innovation : A review and research agenda. *Irish Journal of Management*, *36*(1), 21–31, doi: 10.1515/ijm-2017-0004.

Fielding, N.G. (2017). Combining digital and physical data. In Flick, U. (Ed.), *The Sage handbook of qualitative data collection* (pp. 584–598). London: Sage Publications Ltd.

Foss, N. J., & Saebi, T. (2017). Fifteen years of research on business model innovation: How far have we come, and where should we go?. *Journal of Management*, *43*(1), 200–227, doi: 10.1177/0149206316675927.

Giudice, M. D., Rosaria, M., Peruta, D., & Maggioni, V. (2013). Spontaneous processes of reproduction of family-based entrepreneurship: An empirical research on the cognitive nature of the spin-offs. *Journal of Innovation and Entrepreneurship*, *2*(12), 1–14, doi: 10.1186/2192-5372-2-12.

Gliessman, S. (2016). Transforming food systems with agroecology. *Agroecology and Sustainable Food Systems*, *40*(3), 187–189, doi: 10.1080/21683565.2015.1130765.

Gliessman, S. R., & Rosemeyer, M. (2010). *The Conversion to Sustainable Agriculture: Principles, Processes, and Practices*. Boca Raton, FL: CRC Press.

Haas, Y. (2018). A qualitative approach to business model dynamics. *Journal of Business Models*, *6*(2), 37–43, doi: 10.5278/ojs.jbm.v6i2.2459.

Hermann, J. D., Sangalli, L. C., & Teece, D. J. (2017). Dynamic capabilities: Fostering an innovation-friendly environment in Brazil. *RAE*, *57*(3), 283–287.

Kawakami, J. (2016). Certificação de Produtos orgânicos, Technical Report. CREA-PR, Paraná, available from: https://www.crea-pr.org.br/ws/wp-content/uploads/2016/12/certificacao-de-produtos-organicos.pdf [Accessed 16 march 2019].

Lewandowski, M. (2016). Designing the business models for circular economy — towards the conceptual framework. *Sustainability (Switzerland)*, *8*(1), 43, doi: 10.3390/su8010043.

Loconto, A., & Fouilleux, E. (2019). Defining agroecology: Exploring the circulation of knowledge in FAO's Global Dialogue. *International Journal of Sociology of Agriculture & Food*, *25*(2), 116–137.

Loconto, A., Jimenez, A., & Vandecandelaere, E. (2018). *Constructing Markets for Agroecology: An Analysis of Diverse options for Marketing Products from Agroecology*. Rome: FAO/INRA.

Lozano, M. (2017). Ecosistema para el surgimiento de spin-offs desde la empresa familiar. *Academia Revista Latinoamericana de Administracion*, *30*(3), 290–311, doi: 10.1108/ARLA-09-2015-0242.

Makkonen, H., Pohjola, M., Olkkonen, R., & Koponen, A. (2014). Dynamic capabilities and firm performance in a financial crisis. *Journal of Business Research*, *67*(1), 2707–2719, doi: 10.1016/j.jbusres.2013.03.020.

Mckay, B., & Nehring, R. (2014). *Sustainable agriculture: An assessment of Brazil's Family Farm Programmes in Scaling up Agroecological Food Production, Working Paper, International Policy Centre for Inclusive Growth (IPC-IG), Brasília, DF, 14 March*.

Mezger, F. (2014). Toward a capability-based conceptualization of business model innovation: Insights from an explorative study. *R&D Management*, *44*(5), 429–449, doi: 10.1111/radm.12076.

Mousavi, S., Bossink, B., & van Vliet, M. (2019). Microfoundations of companies' dynamic capabilities for environmentally sustainable innovation: Case study insights from high-tech innovation in science-based companies. *Business Strategy and the Environment*, *28*(2), 366–387, doi: 10.1002/bse.2255.

Muñoz, E.F.P., Niederle, P.A., Gennaro, B.C.de, & Roselli, L. (2021). Agri-food markets towards agroecology: Tensions and compromises faced by small-scale farmers in Brazil and Chile. *Sustainability (MDPI)*, *13*(6), 3096, doi: 10.3390/SU13063096.

Nasiri, M., Rantala, T., Saunila, M., Ukko, J., & Rantanen, H. (2018). Transition towards sustainable solutions: Product, service, technology, and business model. *Sustainability (Switzerland)*, *10*(2), 358. doi:10.3390/su10020358.

Niederle, P.A., Almeida, L.de, & Vezzani, F.M. (2013). *Agroecologia: Práticas, mercados e políticas para uma nova agricultura*. Kairós, Curitiba, PR.

Paraná (2020). Agência de Notícias do Paraná. Procura por orgânicos cresce com a pandemia. https://www.aen.pr.gov.br/modules/noticias/article.php?storyid=108252.

Pieroni, M.P.P., Mcaloone, T.C., & Pigosso, D.C.A. (2019). *Business Model Innovation for Circular Economy and Sustainability: A Review of Approaches*, doi: 10.1016/j.jclepro.2019.01.036.

Plumecocq, G., Debril, T., Duru, M., Magrini, M.-B., Sarthou, J.P., & Therond, O. (2018). The plurality of values in sustainable agriculture models: Diverse lock-in and coevolution patterns. *Ecology and Society*, *23*(1), 21, doi:10.5751/ES-09881-230121.

Raza, J., Liu, Y., Zhang, J., Zhu, N., Hassan, Z., Gul, H., & Hussain, S. (2021). Sustainable supply management practices and sustainability performance: The dynamic capability perspective. *SAGE Open*, *11*(1), 1–14, doi: 10.1177/21582440211000046.

Ruane, J.M. (2005). *Essentials of Research Methods: A Guide to Social Science Research*. Hoboken: Blackwell Publishing.

Saldaña, J. (2016). *The Coding Manual for Qualitative Researchers* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

Sambuichi, R.H.R., Moura, I.F.de, Mattos, L.M.de, Ávilda, M.L.de, Spínola, P.A.C., & Silva, A.P.M.da. (2017). A Política Nacional de Agroecologia e Produção Orgânica no Brasil Uma trajetória de luta pelo desenvolvimento rural sustentável. *Brasília, DF: Ipea*.

Santoro, G., & Usai, A. (2018). Knowledge exploration and ICT knowledge exploitation through human resource management: A study of Italian firms. *Management Research Review*, *41*(6), 701–715, doi: 10.1108/MRR-07-2017-0215.

Sarasini, S., & Linder, M. (2018). Integrating a business model perspective into transition theory: The example of new mobility services. *Environmental Innovation and Societal Transitions*, *27*(September 2017), 16–31, doi: 10.1016/j.eist.2017.09.004.

Schweisfurth, T.G., & Raasch, C. (2018). Absorptive capacity for need knowledge : Antecedents and effects for employee innovativeness. *Research Policy*, *47*, 687–699. 10.1016/j.respol.2018.01.017.

Teece, D.J. (2007). Explicating dynamic capabilities: The nature and microfoudations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*, 1319–1350, doi: 10.1002/smj.

Teece, D.J. (2016). Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm. *European Economic Review*, *86*, 202–216, doi: 10.1016/j.euroecorev.2015.11.006.

Teece, D.J. (2018). Business models and dynamic capabilities. *Long Range Planning*, *51*(1), 40–49, doi: 10.1016/j.lrp.2017.06.007.

Teece, D.J. (2019). A capability theory of the firm: An economics and (strategic) management perspective. *New Zealand Economic Papers*, *53*(1), 1–43, doi: 10.1080/00779954.2017.1371208.

Teece, D.J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. https://www.jstor.org/stable/3088148.

Topleva, S.A., & Prokopov, T.V. (2020). Integrated business model for sustainability of small and medium-sized enterprises in the food industry: Creating value added through ecodesign. *British Food Journal*, *122*(5), 1463–1483, doi: 10.1108/BFJ-03-2019-0208.

Tsoukas, H. (2017). Don't simplify, complexify: From disjunctive to conjunctive theorizing in organization and management studies. *Journal of Management Studies*, *54*(2), 132–153, doi: 10.1111/joms.12219.

UN. (2015). *Transforming our world: the 2030 agenda for sustainable development*. New York: United Nations, Department of Economic and Social Affairs.

Viciunaite, V., & Alfnes, F. (2020). Informing sustainable business models with a consumer preference perspective. *Journal of Cleaner Production*, *242*(1), 118417, doi:10.1016/j.jclepro.2019.118417.

Vilela, G.F., Mangabeira, J.A.de C., Magalhães, L.A., & Tôsto, S.G. (2019). Agricultura orgânica no Brasil: Um estudo sobre o cadastro Nacional de Produtores orgânicos. https://www.infoteca.cnptia.embrapa.br/handle/doc/1108738.

Vitari, C., & David, C. (2017). Sustainable management models: Innovating through permaculture. *Journal of Management Development*, *36*(1), 14–36, doi: 10.1108/JMD-10-2014-0121.

Wirtz, B.W., & Daiser, P. (2017). Business model innovation : An integrative conceptual framework, doi: 10.5278/ojs.jbm.v5i1.1923.

Wirtz, B.W., Pistoia, A., Ullrich, S., & Göttel, V. (2016). Business models: Origin, development and future research. *Long Range Planning*, *49*(1), 36–54, doi: 10.1016/j.lrp.2015.04.001.

Yin, R.K. (2014). *Case Study Research: Design and Methods* (5th ed.). Thousand Oaks, CA: Sage Publications.

Zott, C., & Amit, R. (2007). Business model design and the performance of entrepreneurial firms. *Organization Science*, *18*(2), 181–199, doi: 10.1016/j.lrp.2009.07.004.

Corresponding author
Olívia Prado Schiavon can be contacted at: olischiavon@gmail.com