

# **Agricultural Entrepreneurship: Entry, Diversification and Performance**

Versão final após defesa

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Tese para obtenção do Grau de Doutor em  
**Gestão**  
(3º ciclo de estudos)

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**14 de junho de 2021**



# Dedictory

*À minha mãe*



# Acknowledgements

This was a long journey but I was not alone. My supervisors help me to face each obstacle (and there were so many) as an opportunity. To Professor Ricardo Rodrigues, I would like to thank him for believing in my capacities and to be open to different research approaches since the time he was my master supervisor. And think that all began with sweet cherries... Their pragmatism and concerns about each methodological issue made me grow as a researcher. To Professor João Ferreira, I have no words to thank their permanent support. Besides the technical competence, the capacity to get the best of us is incredible. Their encouragement words were determinant in times where all seem to go wrong. Above all, I have to say that both are a perfect team. Thanks for all!

To my PhD professors, thanks for sharing your knowledge and experience with us. A special word to my PhD colleagues Rozélia Laurett and João Lopes for their friendship. We doubted many times but we managed to reach the end of the road!

I am grateful to the University of Beira Interior and NECE - Research Unit in Business Sciences for all technical support. The participation in research conferences and seminars was particularly important, allowing the share of so different perspectives.

This thesis was possible due to the participation of many agricultural producers that give me some of their precious time to respond to the questionnaire. I hope that they find it useful! Despite all difficulties, they continue to do agriculture and to adapt to many demanding challenges. They have my admiration!

To my family and friends that help me to get here, many thanks to their patience and encouragement. My sweet godson, you are so young but your authenticity and sense of justice make me see what is really important. I am very grateful for you and your brothers make part of my life. A special thanks to my dear friend, or I must say sister, Ana. In all these years, your generosity and sincerity made the difference. It's good to say that you were always there!

Finally, I would like to thank all people that have contributed to the investigation in many ways.

This thesis is dedicated to my mother, the person that I most admire in the world!



# Abstract

The context is determinant in studying entrepreneurship, but specific contexts have received limited attention by researchers, like the agricultural sector. This sector is heterogeneous, with different subsectors and their specificities, besides performance is strongly dependent on the natural conditions of each region. Hence, this thesis aims to analyse the entrepreneurial behaviour of small farmers, their forms of entrepreneurial entry, diversification strategies and the way as they enhance environmental and financial performance.

In Chapter 2, a Systematic Literature Review is presented, based on bibliometric analysis, comprising articles about agricultural entrepreneurship published on two distinct periods: 1969-2012 and 2013-2017. The literature has focused on specific topics as entrepreneurial skills and resources of farmers, as well as strategies to increase farm income attending to market and environmental challenges, but several issues require further investigation. Researchers state that it is needed to attract more entrants to the agricultural sector, although there is still unclear the way the different types of capital influence the forms of entrepreneurial entry. Entrepreneurial strategies to increase farm income are highlighted in the literature, but the various typologies of farm diversification had limited a more comprehensive analysis of this strategy. To face the increasing liberalization of agricultural markets in the last decades, researchers refer that is essential to farmers developing adequate capabilities, namely those related to new technologies and marketing. However, the role of resources and capabilities of farmers on environmental and financial performance needs further research. Hence, based on a questionnaire administered through 160 personal interviews, Chapters 3, 4 and 5 deal with three empirical studies, where those research gaps are addressed, and a quantitative methodology is applied.

Although succession is the most common mean of entry into the agricultural sector, there is a growing number of agricultural entrepreneurs from other sectors. Thus, in Chapter 3, the entrepreneurial entry process of new entrants and farm successors is analysed through two hierarchical logistic regressions, attending to the role of farm capital and age. This study found that younger farmers with previous entrepreneurial experience, but without benefiting from one of the most important Common Agricultural Policy (CAP) measures (the business start-up scheme directed to younger farmers), are likely to be a new entrant. On the other hand, the results show that younger and higher educated farmers with their land but without previous entrepreneurial experience are likely to be a farm successor. Contrary to previous studies that associate the agricultural sector with older farms and a low level of human capital, this study

found that different levels of human capital influence different forms of entrepreneurial entry, like the human capital theory suggests. The findings may support the design of public policies to attract more entrants into the agricultural sector, especially the younger ones and with stronger human capital.

Farm businesses are complex, with many of them not corresponding to different legal entities and others owned by household members. Hence, in Chapter 4, different profiles of farm diversification businesses are discriminated and compared through the respective farm, owner-manager and household characteristics. Based on a Latent Class Analysis of conventional and unconventional diversification strategies, three classes of entrepreneurs were found: Pioneers, Traditionalists and Diversifiers. Pioneers use unconventional agricultural practices; Diversifiers are focused on the diversification of market channels and non-agricultural activities; while Traditionalists prefer a more conventional approach to increase farm income. Furthermore, the findings suggest that all familiar ties in the household are essential to enhance portfolio entrepreneurship, essentially in the Pioneers class. This study provides an original framework that operationalises the concept in conventional and unconventional terms, attending at the lack of a clear operationalization of the concept of farm diversification. It also contributes to a better understanding of how portfolio entrepreneurship is developed in the family farm context. The results suggest that more training programmes on entrepreneurship and marketing must be promoted since farmers became more open to implementing new practices, activities and marketing channels with training.

Farms face financial constraints and increasing environmental pressures from institutions and consumers, which affects their performance. Nevertheless, the way as the resources and capabilities of entrepreneurs influence performance in the agricultural sector requires further analysis. In Chapter 5, applying a partial-least square, structural equation model (PLS-SEM), it is analysed how farms enhance environmental and financial performance through the relationship between Dynamic Capabilities (DCs), Entrepreneurial Orientation (EO), and Environmental Sustainability Commitment (ESC). This study concludes that EO and ESC influence environmental and financial performance positively. Hence, farms can achieve competitive advantage through mitigating their profound impacts on the environment as proposed by the Natural Resource-Based-View (NRBV). Farms are also developing DCs to reconfigure farm businesses, but farmers respond to the higher environmental requirements of agricultural markets primarily through R&D Capabilities and not through Marketing Capabilities. Having as theoretical supports the NRBV and the DCs, this study contributes to a better understanding of the mechanisms through which entrepreneurs enhance financial and environmental performance in sectors with high environmental impacts like agriculture. The

findings suggest that entrepreneurship training projects may enable farmers to approach food security as a market opportunity and not only as rules they must follow.

## **Keywords**

Agricultural entrepreneurship, entrepreneurial entry, new entrants, farm successors, farm diversification, portfolio entrepreneurship, entrepreneurial orientation, dynamic capabilities, performance, human capital theory, natural resource-based view.



# Resumo

O contexto é determinante no estudo do empreendedorismo mas existem determinados contextos que têm recebido uma atenção limitada por parte dos investigadores, como é o caso do setor agrícola. Este setor é heterogéneo, onde coabitam diferentes subsectores com as suas especificidades, além do seu desempenho estar muito dependente das condições naturais de cada região. Nesse sentido, esta tese pretende analisar o comportamento empreendedor dos pequenos produtores agrícolas, nomeadamente as formas de entrada empreendedora, as estratégias de diversificação e a forma como potenciam o nível de desempenho ambiental e financeiro das explorações agrícolas.

No Capítulo 2, é apresentada uma revisão sistemática de literatura, assente numa análise bibliométrica, de artigos sobre empreendedorismo agrícola publicados em dois períodos distintos: 1969-2012 e 2013-2017. A literatura tem incidido sobre tópicos específicos como as skills empreendedoras e os recursos dos produtores agrícolas, bem como estratégias para aumentar o rendimento da exploração agrícola atendendo aos desafios ambientais e do mercado. No entanto, vários aspetos requerem mais investigação. Os investigadores defendem que é necessário atrair mais empreendedores para o setor agrícola, embora ainda não seja claro como os diferentes tipos de capital influenciam a forma de entrada no setor. A literatura também enfatiza as estratégias empreendedoras para aumentar o rendimento da exploração, mas as várias tipologias de diversificação agrícola dificultam uma análise mais profunda desta estratégia. De forma a enfrentar a crescente liberalização dos mercados agrícolas nas últimas décadas, os investigadores referem que é essencial que os produtores desenvolvam capacidades adequadas, nomeadamente as relacionadas com novas tecnologias e marketing. Contudo, o papel dos recursos e capacidades dos produtores agrícolas no desempenho ambiental e financeiro necessita mais investigação. Assim, estas lacunas de investigação são abordadas em três estudos empíricos (Capítulos 3, 4 e 5), recorrendo a uma metodologia quantitativa e com base num questionário realizado através de 160 entrevistas pessoais.

Apesar da sucessão familiar ser a forma de entrada mais comum no setor agrícola, tem crescido nos últimos anos o número de empreendedores agrícolas oriundos de outros setores. Deste modo, no Capítulo 3, o processo de entrada no setor de novos empreendedores e sucessores agrícolas é analisado através de duas regressões logísticas, atendendo ao papel do capital e da idade. Os resultados permitem concluir que os novos empreendedores têm tendência a serem mais jovens e com experiência empreendedora prévia, além de não recorrerem a um dos mais importantes apoios financeiros no âmbito da Política Agrícola Comum: o apoio à instalação de

jovens agricultores. Por outro lado, os resultados demonstram que os produtores mais jovens, com educação superior, que são proprietários dos terrenos mas que não têm experiência empreendedora prévia têm maior probabilidade de serem um sucessor agrícola. Contrariamente a estudos anteriores que associam o setor agrícola com produtores envelhecidos e com um baixo nível de capital humano, este estudo concluiu que diferentes níveis de capital humano influenciam diferentes formas de entrada no setor, tal como a teoria do capital humano sugere. Este estudo pode servir de base à elaboração de políticas públicas de atração de mais empreendedores agrícolas, especialmente os mais jovens e com maior capital humano.

Os negócios agrícolas são complexos já que muitos deles não correspondem a entidades legais diferentes e outros são detidos por membros do agregado familiar. Deste modo, no Capítulo 4, diferentes perfis de diversificação agrícola são discriminados e comparados atendendo às características da exploração agrícola, do proprietário/gestor e do agregado familiar. Com base numa análise de classe latente de estratégias convencionais e não-convencionais de diversificação, constatou-se que os empreendedores agrícolas podem ser agrupados em três classes: Pioneiros, Diversificadores e Tradicionalistas. Os Pioneiros utilizam práticas agrícolas não-convencionais; os Diversificadores estão focados na diversificação dos circuitos comerciais e de atividades não-agrícolas; enquanto os Tradicionalistas preferem uma forma mais convencional de aumentar o rendimento da exploração agrícola. Por outro lado, todos os laços familiares do agregado são essenciais para fomentar o empreendedorismo de portfólio, sobretudo na classe dos Pioneiros. Atendendo à falta de uma operacionalização clara do conceito de diversificação agrícola, este estudo propõe um modelo de análise original que operacionaliza o conceito em termos convencionais e não-convencionais. Contribui ainda para compreender melhor como o empreendedorismo de portfólio é desenvolvido no contexto da exploração agrícola familiar. Os resultados implicam que sejam promovidos mais programas de empreendedorismo e marketing, já que os produtores demonstram maior abertura a novas práticas, atividades e circuitos comerciais se obtiverem a formação adequada.

As explorações agrícolas deparam-se atualmente com constrangimentos financeiros e pressões ambientais cada vez maiores por parte de consumidores e de várias instituições, o que afeta o seu desempenho. No entanto, a forma como os recursos e capacidades dos empreendedores influenciam o desempenho no setor agrícola requer uma análise mais profunda. No Capítulo 5, recorrendo a um modelo de equações estruturais, é analisada a forma como as explorações agrícolas promovem o desempenho ambiental e financeiro, através da relação entre Capacidades Dinâmicas (CD), Orientação Empreendedora (OE) e Compromisso com a Sustentabilidade Ambiental (CSA). Os resultados permitem aferir que tanto a OE como o CSA

têm um efeito positivo no desempenho ambiental e financeiro. Deste modo, as explorações agrícolas podem obter uma vantagem competitiva através da mitigação dos seus impactos no ambiente, tal como é proposto pela perspectiva dos recursos naturais. Os empreendedores também desenvolvem CD de forma a poderem reconfigurar os negócios agrícolas, embora enfrentem os elevados requisitos ambientais dos mercados agrícolas sobretudo através das capacidades de I&D e não através das capacidades de marketing. Tendo como suportes teóricos a perspectiva dos recursos naturais e as CD, este estudo contribui para a compreensão dos mecanismos através dos quais os empreendedores promovem o desempenho ambiental e financeiro em setores com um elevado impacto ambiental como é o setor agrícola. Com base nos resultados obtidos, os programas de empreendedorismo agrícola devem assegurar que os produtores enfrentem a segurança alimentar como uma oportunidade de mercado e não apenas como regras que devem seguir.

## **Palavras-chave**

Empreendedorismo agrícola, novos empreendedores, sucessores agrícolas, diversificação agrícola, empreendedorismo de portfólio, orientação empreendedora, capacidades dinâmicas, desempenho, teoria do capital humano, perspectiva dos recursos naturais.



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## List of acronyms

AFN	Alternative Food Networks
AIC	Akaike Information Criterion
AVE	Average Variance Extracted
BIC	Bayesian Information Criterion
BLRT	Bootstrap Likelihood Ratio Test
CAP	Common Agricultural Policy
CR	Composite Reliability
DCs	Dynamic Capabilities
EO	Entrepreneurial Orientation
EP	Environmental Performance
ESC	Environmental Sustainability Commitment
EU	European Union
FP	Financial Performance
ICTs	Information and Communication Technologies
LCA	Latent Class Analysis
LMR-LRT	Lo–Mendell–Rubin adjusted Likelihood Ratio Test
LPA	Latent Profile Analysis
MC	Marketing Capabilities
NGOs	Non-Governmental Organizations
NRBV	Natural Resource-Based-View
NUTS	Nomenclature of Territorial Units for Statistics
OR	Odds ratio
PDO	Protected Designation of Origin
PGI	Protected Geographic Indication
PLS-SEM	Partial-Least Square, Structural Equation Model
RBV	Resource-Based-View
RDC	Research & Development Capabilities
SD	Standard Deviation
SE	Standard Error
SLR	Systematic Literature Review
UBI	University of Beira Interior
UAA	Utilised Agricultural Area
USDA	United States Department of Agriculture
VIF	Variance Inflation Factors



# **Chapter 1 - General Introduction**

## **1.1. Problem statement**

Entrepreneurship is focused on why, when, and how individuals identify, evaluate, and pursue opportunities (Fitz-koch, Nordqvist, Carter, & Hunter, 2018; Scott Shane & Venkataraman, 2000). Entrepreneurship is not, therefore, an occupation of a person, since entrepreneurial behaviour may only occur during a particular phase of their career and/or concerning a specific part of their activities (Wennekers & Thurik, 1999).

Despite the importance of the agricultural sector in the early works on entrepreneurship in the 18<sup>th</sup> and 19<sup>th</sup> centuries (Vik & McElwee, 2011), the empirical research in this field has neglected the agricultural sector for an extended period and has focused on industries as manufacture, high-technology, and service (Alsos, Carter, Ljunggreen, & Welter, 2011). Agriculture was usually seen as a low-tech industry with limited dynamics, operated by many small family firms in a market heavily regulated and financially supported (Green, Covin, & Slevin, 2008; Lans, Seuneke, & Klerkx, 2017). Nevertheless, agriculture is today one of the world's largest sectors, employing over one thousand million people and accounting for 3% of global GDP (FAO, 2016; Fitz-koch et al., 2018), with a significant application of high technology since, during the last century, extraordinary advances in engineering knowledge have revolutionised farming (Cavallo, Ferrari, Bollani, & Coccia, 2014; Sassenrath et al., 2008).

Agriculture presents differences regarding the sectors of manufacture and high technology (Vermeire, 2009), but farmers can be considered as entrepreneurs and as decision-makers who aim to maximize profits. Consequently, agricultural entrepreneurship can be analysed through methods used in non-agricultural sectors (Carter & Rosa, 1998; McElwee, 2006a; Phillipson, Gorton, Raley, & Moxey, 2004). However, the relationship between farmer and his business is a complex subject, since the farmer can be an owner, lessee, manager, subcontractor or a combination, implying that the methods used to analyse entrepreneurs from other sectors are not easily transferable for the analysis of the agricultural sector (McElwee, 2008). Hence, agricultural entrepreneurship may be a particular case in the entrepreneurship discipline (Vik & McElwee, 2011), depending on the type of research question and applied research paradigm (Lans et al., 2017).

Despite the incongruities detected in the literature on agricultural entrepreneurship and their multidisciplinary nature, Systematic Literature Reviews (SLR) based on bibliometric analyses

or comprising all subject areas were not found. Moreover, periods reflecting different dynamics of investigation were not identified in the previous SLR. Thus, an ampler bibliometric review is needed to better comprehend the agricultural entrepreneurship field in different periods.

More empirical studies must also be conducted on the field since there are various research gaps to be attended. First, it is needed to know the mechanisms related to the entrepreneurial entry on the agricultural sector. Although succession is the most common mean of entry into the European agricultural sector, there is a growing number of agricultural entrepreneurs from other sectors who bring with them various resources (Bertolozzi-Caredio, Bardaji, Coopmans, Soriano, & Garrido, 2020; EIP-AGRI, 2016). On the other hand, there is a lack of young farmers in Europe (Zagata & Sutherland, 2015), and not all could be agricultural entrants since entrants may have any age (Zagata & Sutherland, 2015). Furthermore, the entrepreneurial activity of seniors can be considered as a solution to enhance their quality of life post-retirement and to face the increasing costs of older age living arrangements (Perenyi, Zolin, Maritz, & Perenyi, 2018), especially in Mediterranean countries that present a higher share of farmers older than 55 years (Giannakis & Bruggeman, 2015).

Regardless of age, the economic crisis since 2008 has reinforced, in southern countries, the return to rural areas of people from the cities who may be the owners of inherited family property. In this case, the rural community and the reactivation of social and family networks allow the access to affordable housing and food provision, while offering opportunities for employment in farming and para-agricultural activities (Anthopoulou, Kaberis, & Petrou, 2017). Despite there are successful and innovative examples of new entrepreneurs, there are also unsuccessful attempts by those who lacked the financial and technical means for starting new ventures (Anthopoulou et al., 2017; Kasimis & Papadopoulos, 2013). Irrespective from the category, the agricultural sector needs to attract more entrants (Barbieri & Mahoney, 2009). However, it must be kept in consideration that not all have the same stocks of capital. Hence, the influence of farm capital and age on new entrances and farm succession requires further investigation. Moreover, it is needed to extend the application of the human capital theory to the entry to the agricultural sector, examining how human capital influence different forms of entrepreneurial entry (Estrin, Mickiewicz, & Stephan, 2016).

Another gap identified in the literature is related to the operationalisation of the farm diversification concept. Although farmers always have diversified their sources of income, various typologies of farm diversification are employed and adapted to each context. Until the 1950s and 1960s, mixed farms were predominant in Europe, combining crop and livestock production. The introduction of Common Agricultural Policy (CAP) at the end of the 1960s,

offering price and market support, led many farms to specialise in either milk, beef or pig production, or in fruits and vegetables (Roest, Ferrari, & Knickel, 2017). This change had increased income to large farms but had resulted in a lower income to smaller farms (Rønning & Kolvereid, 2006). The liberalisation of agricultural trade and the successive CAP reforms since the 90s, with the decline of farm subsidies, had increased competitive pressures on farmers, especially in several rural regions located in the southern and eastern parts of the EU as Portugal (Giannakis & Bruggeman, 2015). Those reforms also promoted financial support to the diversification of farm businesses outside conventional agriculture (Barnes, Hansson, Manevska-tasevska, Shrestha, & Thomson, 2015), which may explain the increasing number of farmers looking in the last years for new strategies and sources of income besides core farm activities (Alsos et al., 2011; Carter, 1998a; K. M. Vesala, Peura, & McElwee, 2007), including small farms (Giaccio, Giannelli, & Mastronardi, 2018). Nevertheless, the unconventional nature of farm diversification is not yet clear in the literature.

The agricultural sector is mainly composed of small family businesses, where management and control are not separated (Pindado & Sánchez, 2017), with the farm household members, mainly women, playing a crucial role in the development of new businesses (Lans et al., 2017; Morris, Henley, & Dowell, 2017; Seuneke & Bock, 2015), such as agritourism, care farms or kindergarten farms. As those businesses may be related to the creation of farm-related firms, some authors defend that the entire household and not only the farmer should be included in the analysis of entrepreneurial processes and strategies (Carter, 1999; Rønning & Kolvereid, 2006). Hence, farm diversification and family portfolio entrepreneurship must not be examined separately.

The role of agriculture is not only to produce but also to preserve biodiversity and create a cultural heritage through the centuries (Daugstad, Rønningen, & Skar, 2006). Therefore, the impact of agricultural production on the environment, the landscape and land-use are much more prominent than the impact of other economic sectors (Britz, Ittersum, Lansink, & Heckelei, 2012). Besides environmental aspects, the particular economic characteristics of the industry such as a strong regulatory environment and mature markets make this sector interesting to study the configuration and restructuring of entrepreneurs' resources (Alsos et al., 2011; Grande, Madsen, & Borch, 2011; Pindado & Sánchez, 2017). However, the influence of Entrepreneurial Orientation (EO) and the capabilities of farmers on performance has been neglected by researchers.

Attending that more studies on agricultural entrepreneurship with an explicitly theoretical framework are needed (Fitz-koch et al., 2018), the Natural Resource-Based-View (NRBV) and

the Dynamic Capabilities (DCs) may be adequate perspectives to examine how farms improve performance. According to NRBV, firms can obtain a competitive advantage through improving environmental sustainability (Hart, 1995). However, entrepreneurs must also develop DCs to readapt businesses to environmental and financial challenges, including in small farms (Grande, 2011). Hence, the way as EO, DCs and environmental strategies are associated with performance in the agricultural sector requires further investigation.

## **1.2. Research objectives**

The entrepreneurial activity is different across regions (González-Pernía, Guerrero, Jung, & Peña-Legazkue, 2018) and agricultural subsectors (McElwee, 2008). Previous studies had concluded that agricultural entrants tend to be attracted by specific sectors or regions (EIP-AGRI, 2016; Góngora, Milán, & López-i-Gelats, 2019), where specific additional farm businesses or even farm-related firms may be conducted. In the same way, the effects of the entrepreneurial activity of farmers on environmental and financial performance may also present particularities (Cerutti et al., 2014). As context impacts the existing range of opportunities, activities and outcomes (Fitz-koch et al., 2018), those issues should be addressed in a particular agricultural subsector and a specific region.

Applying a regional and sectoral context approach, the general objective of this thesis is to examine the entrepreneurial behaviour of owner-managers running small agricultural businesses in an inland region. Based on four studies, the specific objectives of this investigation are the following:

- 1) To conduct a Systematic Literature Review (SLR) based on bibliometric analysis, examining how the investigation in agricultural entrepreneurship is approached in different periods;
- 2) To analyse the influence of farm capital and age on new entrances and farm succession
- 3) To discriminate different profiles of farm diversification businesses, based on their conventional and unconventional nature, and associate it with family portfolio entrepreneurship;
- 4) To understand the role that the resources and capabilities of agricultural entrepreneurs play in improving environmental and financial performance.

## **1.3. Study context**

Portugal provides an exciting context for examining agricultural entrepreneurship. Despite the reduction in the number of farms in recent decades (Giannakis & Bruggeman, 2015), agriculture has demonstrated its resilience throughout periods of a severe economic downturn

in Europe (European Commission, 2013), especially in the Mediterranean countries, such as Portugal, most deeply affected by the fallout of the 2008 financial crisis (Giannakis & Bruggeman, 2015).

Portugal produces some agricultural products that are specific to particular countries with appropriate edaphic and climatic conditions for their production, such as fresh fruit, even while the country only obtains a modest global weighting in the European Union's (EU) agricultural sector. These fruits are harvested earlier in southern EU countries when compared with other member states, which enables them to achieve higher market prices, and correspondingly constituting an already identified and explored opportunity by producers in Portugal. In this way, Portugal ranked in the EU 2016 top-ten of countries with the largest areas of fresh fruit growing; the third-highest area in the case of pears and ranked sixth in the case of both peaches and sweet cherries (Eurostat, 2018). Similarly to other European farms, Portuguese farms also carry out Other Gainful Activities (OGA) besides agriculture. However, contrarily to the set of EU where the processing of farm products and contractual work is underlined, the forest is the main OGA in Portugal (Eurostat, 2019).

Following how farms are nationally and regionally heterogenic in terms of their management systems, infrastructures and natural aspects (Britz et al., 2012; McElwee, 2008), Carter (2001) states that recourse to a single study area allows for studying entrepreneurial behaviours without requiring any examination of the impacts of diverse environments. Hence, our study seeks to grasp the importance of entrepreneurial behaviour among farmers with fresh fruit businesses in the Beira Interior region.

Beira Interior is situated in the central-eastern interior of Portugal. It comprises five NUTS III: Beira Interior Norte, Beira Interior Sul, Cova da Beira, Pinhal Interior Sul and Serra da Estrela. According to the last Population Census in 2011 (INE, 2012), this region has 351756 inhabitants, approximately 3 percent of the Portuguese population. The tendency of ageing is evident since the residents with more than 65 years old represent 28 percent of the total, while this proportion decreases to 19 percent in Portugal. Concerning to the employed population, the tertiary sector prevails (69 percent), followed by the secondary (26 percent) and the primary (5 percent) sectors. However, the importance of the primary industry is higher in this region than in Portugal (3 percent).

Contrary to other European countries, the Portuguese agricultural sector lacks the organizational structure for large scale competition. Portugal has traditionally lacked in strong producer organizations (Brusselaers, Poppe, & Azcarate, 2014) and with the Beira Interior

region having only one in the fresh fruit subsector, comprising of only a small proportion of farmers. Nevertheless, farmers in the region have embraced innovative ways of mitigating those difficulties, specifically through the creation of private packaging and marketing units (Dias et al., 2017) adapted to the environmental demands of contemporary agricultural markets. In 2017, the Beira Interior region contained 7502 ha of fresh fruits representing 16 percent of the total in Portugal while also hosting the largest area of sweet cherries (43 percent) and peaches (47 percent), in addition to registering significant production levels for other fresh fruits, such as apples and pears (INE, 2019). According to the most recent Portuguese Agricultural Census in 2009 (INE, 2011), this region contains a total of 5460 farms growing fresh fruits, of which 966 span areas larger than 1 ha (INE, 2011). In recent years, the construction and enlargement of the Cova da Beira hydro-agricultural system has enabled irrigation to reach a significantly larger number of farms and thereby boosting agricultural productivity.

The Beira Interior region fresh fruit subsector has attained a dimension capable of enhancing production and market dynamics that are not yet visible in other Portuguese regions. These not only reflect its position as the leading region for sweet cherry and peach production but also stem from how structures and players have evolved in recent years to operate competitive forms of internal organization and commercialization in demanding markets (Dias et al., 2017; Dias, Alberto, & Simões, 2016; DRAPC, 2007a, 2007b).

#### **1.4. Conceptual model**

The conceptual model is based on a sectoral and regional context approach. In this sense, this investigation is centred on small agricultural businesses of an inland region. Small farms are essential in those areas since, besides enhancing businesses creation, they contribute to countryside conservation, the preventing the risk of fire, continuing employment and even to preserve traditions (Colombo & Perujo-Villanueva, 2017).

Wealth creation is often related to entrepreneurship, reflecting stocks of capital such as financial, physical, human and social capital (Lumpkin, Bacq, & Pidduck, 2018). However, the influence of farm capital on the entrepreneurial entry process needs a more profound analysis in the agricultural sector. Individuals with low financial capital are likely to face significant obstacles in identifying and exploiting entrepreneurial opportunities (Shelton, 2010). Nevertheless, recently people with more financial capital seems to prefer investing in the agricultural sector, neglecting other sectors traditionally more profitable (Dias & Rodrigues, 2019). Physical capital comprises land, buildings and equipment (Lumpkin et al., 2018). Still, agriculture is dependent on land as a production factor (Britz et al., 2012), which can limit

business growth (Stenholm & Hytti, 2014). Social capital is also essential to the creation of new ventures since allowing access to resources, information and social support (Pindado & Sánchez, 2017). However, the entrepreneurs' access to established networks can be restricted by the rural context, characterised by a small population, lack of infrastructure and limited access to resources (Jack & Anderson, 2002; Meccheri & Pelloni, 2006).

Farmers generally present a low level of human capital comparatively with other sectors (Pindado & Sánchez, 2017). However, the increasing level of qualification and professionalization of new entrants (Zagata et al., 2017) may improve the quality of agricultural entrepreneurship (Guzmán & Santos, 2001). As suggested by the human capital theory (Becker, 1964), it is essential to comprehend how human capital affects different forms of entrepreneurial entry (Estrin et al., 2016) on the agricultural sector, namely new entrances and farm succession. In particular, entrepreneurs who have previous entrepreneurial experience and higher education may be associated with different forms of entrepreneurial entry. In this sense, this study proposes to analyse how different types of capital affects new entrances and farm succession, extending the human capital theory to the agricultural sector.

Besides the creation of new ventures, the development of new businesses on the existing business entity can be characterised as an entrepreneurial process, including many of the same challenges faced by new business formation processes (Ferguson & Hansson, 2015). However, the farm diversification literature has particularities comparatively to the general strategic diversification literature. The last one focuses on the creation and management of multiple ventures as a routine corporate managerial strategy of large companies, having as a primary goal the maximization of managerial efficiency (Sieger, Zellweger, Nason, & Clinton, 2011). In contrast, farm diversification is generally defined as on-farm or farming-related activity, providing goods or services based on existing farm resources, that were previously employed in conventional agriculture (Hansson, Ferguson, Olofsson, & Rantamäki-Lahtinen, 2013; Vik & McElwee, 2011), and is a strategy conducted by small as well as large farms to increase farm income. As the frontiers between conventional and unconventional farm businesses are not always evident in the literature, this study proposes an original framework that operationalises the conventional and unconventional nature of farm diversification, covering agricultural and non-agricultural diversification.

In many cases, farm diversification is the first step of a process of increasing business interests, that is concluded through firm registration when they achieve maturity and scale (Carter, 1998a). In this sense, farm diversification is closely related to portfolio entrepreneurship (Haugen & Jostein, 2008), which reflects the ownership of multiple businesses (Westhead &

Wright, 1998). As family entrepreneurs tend to participate more in portfolio entrepreneurship comparatively with non-family entrepreneurs (C. Cruz & Justo, 2017), it is especially relevant to analyse this issue in the small business and family farm context (Carter, 1998a; Sieger et al., 2011). Family portfolio entrepreneurship may be enhanced by growth aspirations, wealth and risk diversification, value maximization, or the need for providing career opportunities for family members (Sieger et al., 2011). Nevertheless, there is a lack of knowledge of how the process of family portfolio entrepreneurship is developed since the focus is often only on the firm and not in the household (Carter & Ram, 2003; C. Cruz & Justo, 2017; Estrada-Robles, Williams, & Vorley, 2020). It is possible to understand better this process, analysing conjointly farm diversification and family portfolio entrepreneurship.

Entrepreneurs create and develop businesses to achieve superior performance, although the importance of the resources and capabilities of agricultural entrepreneurs on performance remains unclear. The use of the Natural Resource-Based View (NRBV) and the Dynamic Capabilities (DCs) perspective may allow us to better comprehend this process. The NRBV is an extension of the Resource-based-view (RBV) which did not take in consideration the influence of the natural environment on business operations and performance (Bortsie-Aryee, Gabriel, Fennessy, O’Kane, & Walton, 2018; Hart, 1995; Hart & Dowell, 2011). The environmental strategies of organizations may have a positive influence on both environmental and financial performance (Aboelmaged, 2018), based on resources and capabilities that are valuable, rare, and inimitable (Barney, 1991). Hence, the NRBV proposes that firms’ competitive advantage can be achieved as a result of their sustainable development, pollution prevention and product stewardship resources (Hart, 1995; Hart & Dowell, 2011).

DCs may allow the organization to become greener (Demirel & Kesidou, 2019), through the restructuring of their existing resources and basic capabilities (Teece, Pisano, & Shuen, 1997). They are essential to adapt to an uncertain environment and gain competitive advantages (Aboelmaged, 2018), especially in sectors with demanding environmental requirements. Some small firms do not have the appropriate capabilities to promote environmental strategies. But others can identify and explore opportunities to enhance performance (E. A. Khan, Royhan, Rahman, Rahman, & Mostafa, 2020). Regardless from size, firms that face high risks from the consequences of climate change must invest in particular dynamic capabilities suitable to respond to the specific challenges that the physical environment places on the firm’s operations (Hart & Dowell, 2011). Therefore, applying the NRBV and the DCs perspectives on a sector with high environmental impacts and characterised by small businesses, as it is agriculture, may bring new insights to the entrepreneurship literature.

Figure 1.1 represents the thesis conceptual model.

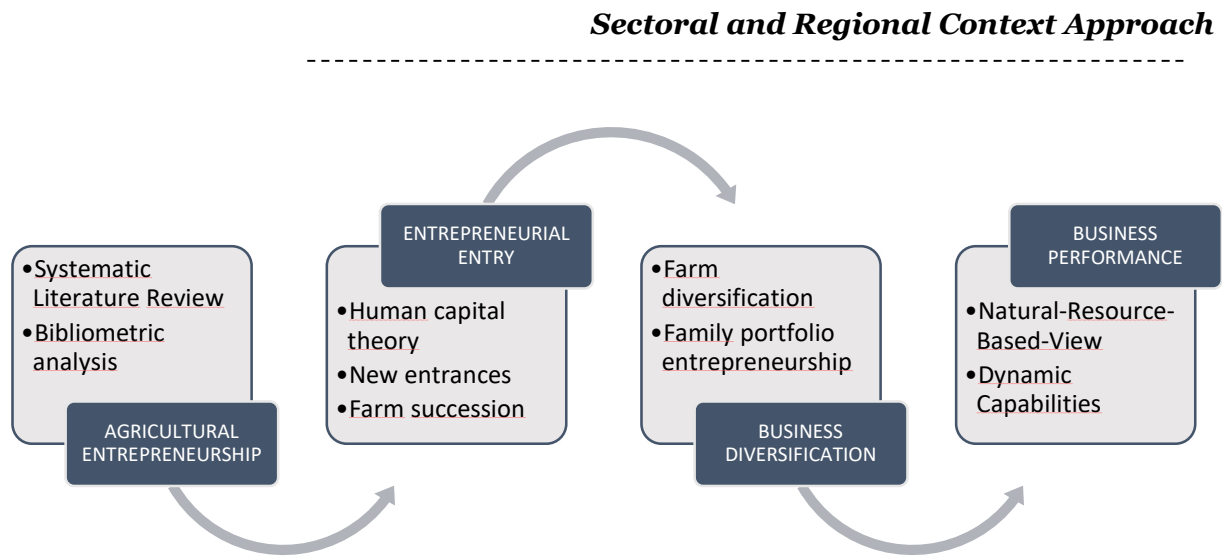


Figure 1.1 - Thesis conceptual model

## **1.5. Research design and methodology**

### **1.5.1. Research approach**

There are three main epistemologies in the social sciences: positivism, relativism and social constructionism. This thesis can be included in the relativist posture, although it has some links with the positivist posture. The relativist epistemology states that, as the regular patterns in human and organizational behaviour are often difficult to identify and explain due to the number of factors and variables involved, surveys are the adequate method (Easterby-Smith, Thorpe, & Jackson, 2008). Surveys are also associated with the positivist posture, which requires the formulation of hypotheses. However, the positivism usually assumes that there are true answers and prefer experimental methods, predominating in natural and medical sciences.

Besides epistemological positions, there is also a distinction between quantitative and qualitative methods. The first ones are associated with the positivist and relativistic epistemologies, and the second ones with social constructionism. Even though the frontiers are not always clear, quantitative methods require data which is in the form of or can be expressed as numbers. In contrast, qualitative methods involve collecting data that is primarily

in the form of words (Easterby-Smith et al., 2008). Attending to the research objectives, this thesis adopts a quantitative approach, collecting primary data through a survey.

### **1.5.2. Unit of analysis**

As this study focuses on the owner-managers of small farm businesses, it is needed first to define farm and small business. According to Eurostat (2017), a farm or agricultural holding is technically, and economically, a single unit operated through a single management structure (with one manager or co-managers), which carries out agriculture as its primary or secondary activity. The small firm definition can apply different criteria, such as the number of employees, structural characteristics, firm age, total turnover or assets in addition to different definitions depending on the respective country and sector (Matanda, Ndubisi, & Jie, 2014). In the case of the agricultural sector, farm size may also include the utilized agricultural area. Under these criteria, small farms in the European Union generally class as those with an area of under 5 ha (European Commission, 2013), while small and medium farms in the banana sector of Ecuador cultivate areas of less than 100 ha (Gellynck, Cárdenas, Pieniak, & Verbeke, 2015). Even though the specific characteristics of each country and sector require taking into account whenever analysing the dimension of farms, our study defines small farms as independently operated farms that are not dominant and have comparatively fewer resources than other farms in that market (Matanda et al., 2014).

The unit of analysis is the owner-manager of farms with fresh fruits businesses located in the Beira Interior region in Portugal, occupying an area higher than 1 ha. This kind of area already requires a strategy for managing all the agricultural operations, from pruning through to harvesting, to obtain income. Despite the strong dynamics of the fresh fruit subsector in the region, this subsector remains significantly fragmented with many small farms in mutual competition and no one with the market leadership (Dias et al., 2017), competing with farms located in other regions and countries, essentially Spain, with more resources (Dias, 2012). Regardless of farm size, farmers can identify business opportunities and develop strategies to create profitable businesses (McElwee, 2008). Hence, they are also susceptible to be analysed as entrepreneurs and decision-makers who pursue the maximization of profits (Carter & Rosa, 1998; McElwee, 2006a; Pindado & Sánchez, 2017).

### **1.5.3. Sample and data collection**

In line with previous studies on agricultural entrepreneurship, we applied a convenience sample (Morris et al., 2017). Given the lack of databases detailing agricultural activities or agricultural variables (Alsos et al., 2011; Pindado, Sánchez, Verstegen, & Lans, 2018), many researchers develop farmer directories in conjunction with sector stakeholders such as

suppliers, agricultural associations or even higher education institutions (Gellynck et al., 2015). In our case, we sourced the directory through research projects developed by two higher education institutions in the Beira Interior region (the Agrarian Higher School of Castelo Branco and the University of Beira Interior) and correspondingly incorporated approximately 200 owner/managers of fresh fruit businesses (Carvalho & Marcelino, 1997; Dias et al., 2017, 2016). The number identified of fresh fruit farms with more than 1 ha was 181.

Primary data were collected through a questionnaire administered by personal interviews with the farmers. Personal interviews are used in this context since allow to obtain accurate data in situations where there are complex instructions to how to answer questions, and the target population may be reluctant to divulge confidential or personal information (Easterby-Smith et al., 2008). To improve the response rate, we contacted the farmers directly, either via telephone or in-person on their farms, presenting the study's purpose and scheduling the personal interview. The interviews took place between July and October of 2019 and lasted thirty minutes on average.

The number of valid questionnaires obtained was 160, indicating a response rate of 88.4 percent. It is fair to assume the sample is representative of the Beira Interior region as it represents 16.6 percent of the 966 fresh fruit farms with an area greater than 1 ha (INE, 2011), in keeping with previous studies on the agricultural sector (Carter, 1998b). Furthermore, this accounts for 51.6 percent of the area cultivating the two main species of fresh fruits (peaches and sweet cherries) and 36.3 percent of the area growing fresh fruits.

#### **1.5.4. Approaches in individual chapters**

Four studies were developed, attending to the general objective of this thesis. First, a bibliometric review on agricultural entrepreneurship was elaborated. This review was provided with the theoretical background to conduct three empirical studies of quantitative nature, based on a questionnaire administered through 160 personal interviews. In each study, different multivariate statistical techniques and different software were used. Contrary to simple statistics, multivariate techniques are more complex, reflecting the analysis of more than two variables, and allow to convert the data collected into knowledge (Hair, Black, Babin, Anderson, & Taham, 2006).

Chapter 2 aims to address how the research in agricultural entrepreneurship is approached in two distinct periods. It includes a systematic literature review, based on bibliometric analysis, encompassing articles about agricultural entrepreneurship published on the periods 1969-2012 and 2013-2017. Through the application of a transparent and reproducible procedure,

Systematic Literature Reviews (SLR) improve both the quality of the review process and its results (Tranfield, Denyer, & Smart, 2003). The research focuses on articles from Scopus database which is considered the largest abstract and citation database of peer-reviewed literature (Baier-Fuentes, Merigó, Amorós, & Gaviria-Marín, 2018; Palomo, Figueroa-Domecq, & Laguna, 2017). The SLR is based on a bibliometric analysis, which requires the application of a quantitative analysis to publications (Ferreira et al., 2016). The bibliometric technique of co-words is used to scrutinize the literature, since it enables the description of the state-of-the-art research, being produced at the end a mapping with the relations between the various terms and their association in thematic clusters (López-Fernández, Serrano-Bedia, & Pérez-Pérez, 2016). The comparative analysis between the periods 1969-2012 and 2013-2017 is made through two primary areas: descriptive analysis and cluster analysis. The software VOSviewer (van Eck, Waltman, Dekker, & van den Berg, 2010; Waltman, van Eck, & Noyons, 2010) was used to perform the bibliometric analysis.

Chapter 3 pretends to examine the entrepreneurial entry process on the agricultural sector, through the influence of farm capital and age on new entrances and farm succession. Farm successors are individuals or groups that inheritance a farm, while new entrants are defined as individuals or groups who have run a farm for ten years or less (Ahearn & Newton, 2009; EIP-AGRI, 2016). To investigate the likelihood to be a new entrant and a farm successor, two binary hierarchical logistic regressions were estimated attending to the effects of financial, physical, social and human capital, as well as age. This type of regression allows us to predict and explain a binary categorical variable instead of a metric dependent variable, where linear regression is applied (Hair et al., 2006). The statistical analyses were performed with SPSS (version 26) software.

Chapter 4 aims to discriminate different profiles of farm diversification businesses, based on their conventional and unconventional nature, and link it with family portfolio entrepreneurship. To obtain those profiles, Latent Class Analysis (LCA) was used since it categorises a heterogeneous sample into homogeneous groups or latent classes of individuals regarding a set of indicators (Ven, 2016). Comparatively to traditional cluster analysis approaches, it provides more rigorous criteria for determining the number of groups (Pastor, Barron, Miller, & Davis, 2007). MPlus statistical package – version 8.0 (Muthén & Muthén, 2017) was used to conduct the LCA while SPSS (version 26) software was used to perform all statistical tests.

The objective of Chapter 5 is to comprehend the impacts of resources and capabilities of agricultural entrepreneurs on improving environmental and financial performance. A partial-

least square, structural equation model (PLS-SEM) was performed to examine how farms enhance performance through the relationship between Dynamic Capabilities (DCs), Entrepreneurial Orientation (EO), and Environmental Sustainability Commitment (ESC). SEM enables to test models embracing multiple equations in which the same variable may be both a dependent variable and an independent variable (Hair et al., 2006). In particular, the partial least squares SEM (PLS-SEM) was used since the research aims the explanation of variance (prediction of the constructs), being appropriate to small sample sizes and complex models, and making practically no assumptions about the underlying data (Hair, Hult, Ringle, & Sarstedt, 2017). The statistical analysis was conducted with Smart-PLS software (version 3).

## **1.6. Research contribution**

This thesis contributes to the entrepreneurship field, reinforcing the importance of taking into consideration a sectoral and regional context approach.

In Chapter 2, the Systematic Literature Review (SLR), based on a bibliometric analysis, contributes to better comprehend the literature about agricultural entrepreneurship in different periods. Comparing the periods 1969-2012 and 2013-2017, the SLR shows that entrepreneurial skills are underlined in both periods but the period 2013-2017 is characterised by a higher level of complexity of the literature. In the first period, researchers state that farmers can be considered as entrepreneurs and as decision-makers who aim to maximize profits (Carter, 1998a; McElwee, 2006a; Phillipson et al., 2004), especially those who are involved on farm diversification since it requires more entrepreneurial skills (McElwee, Anderson, & Vesala, 2006; Pyysiäinen, Anderson, McElwee, & Vesala, 2006). In the period 2013-2017, as agricultural entrepreneurs seem to have less entrepreneurial skills than other sectors (Pindado & Sánchez, 2017), there is a concern about the improvement of those skills through the implementation of entrepreneurship programmes, oriented particularly to younger people. The elaboration of several typologies of farm diversification and the use of farm resources are emphasised on the first period, while differentiation strategies based on the provenance of the product and on environmental issues are also highlighted by the researchers in the last years. The following three empirical studies show the role of small farms on the entrepreneurial entry process, business diversification and business performance in a Portuguese inland region.

The study included in Chapter 3 contributes to a better understanding of the entrepreneurial entry process in agriculture, through the analysis of the effects of farm capital and age on new entrances and farm succession. In particular, it contributes to analyse this process in countries presenting a large number of older farmers and small farms (Giannakis & Bruggeman, 2015).

Although entrepreneurship databases do not comprise agricultural variables (Pindado & Sánchez, 2017), this study shows the importance of considering specific stocks of capital in the agricultural sector, namely agricultural area and Common Agricultural Policy (CAP) measures. This research also extends the application of the human capital theory to different forms of entrepreneurial entry (Estrin et al., 2016) in the agricultural sector, a sector commonly associated with a lower level of human capital (Pindado & Sánchez, 2017).

In chapter 4, this study develops an original framework based on the conventional and unconventional nature of farm diversification, contributing for clarifying this concept regardless of the context. As the creation process of additional businesses by all members of the household should be scrutinised (A. D. Cruz, Hamilton, & Jack, 2012; Estrada-Robles et al., 2020), our study contributes to better comprehend how portfolio entrepreneurship is developed in the family farm context, focusing on the type of farm-related firms created and the type of family ties. Attending that farm businesses are complex, with many of them not corresponding to different legal entities and others owned by household members, this research identifies distinct profiles of farm diversification businesses and compare the respective farm, owner-manager and household characteristics.

In chapter 5, the study contributes to a better comprehension of how entrepreneurs improve both financial and environmental performance. Works addressing the links between Entrepreneurial Orientation (EO) (Roxas, Ashill, & Chadee, 2017; Yu, Ramanathan, & Nath, 2017), as well as resources and capabilities of farmers (Grande, 2011; Grande et al., 2011; Pindado & Sánchez, 2017; Pindado et al., 2018), on both financial and environmental performance of organizations are scarce. The analysis of this issue on sectors with high environmental impacts like agriculture brings new insights for the literature. This study also contributes to reinforcing the importance of defining an explicitly theoretical framework on agricultural entrepreneurship research (Fitz-koch et al., 2018), applying the Natural Resource-Based-View (NRBV) (Hart & Dowell, 2011) and the Dynamic Capabilities (DCs) approach (Teece et al., 1997) to the analysis of small farms.

## **1.7. Structure of the thesis**

This thesis is elaborated in the form of articles/studies and is constituted by six chapters. The first chapter is a general introduction, where are addressed several issues like problem statement, research objectives, study context, conceptual model, research design and methodology, research contribution and structure of the thesis. The second chapter comprises a Systematic Literature Review (SLR), which has originated the publication of two articles in

the Journal of Rural Studies, corresponding to two distinct periods of the literature on agricultural entrepreneurship: 1969-2012 and 2013-2017.

Chapters 3, 4 and 5 include three empirical studies referring respectively to entrepreneurial entry, business diversification and business performance. The last chapter involves the general conclusions, where final considerations, implications, limitations and future lines of research are pointed out.

## **Chapter 2 - Agricultural entrepreneurship: a Systematic Literature Review**

### **2.1. Introduction**

In the last years, there has been a growing consensus that the identification, evaluation, and pursuit of entrepreneurial opportunities is a distinctive aspect of entrepreneurship, including in the agricultural sector (Lans et al., 2017; Scott Shane & Venkataraman, 2000). In this sense, the adaptation behaviour of farmers to the recent environmental, social and economic crisis has resulted in increasing attention of researchers regarding entrepreneurship in agriculture (Seuneke, Lans, & Wiskerke, 2013).

Agricultural firms have been forced to adapt to new challenges that have emerged both on the demand side and on the supply side (Gellynck et al., 2015), such as changes in the market, changes in consumer habits, food safety, sustainability and biotechnology (Lans et al., 2017). This results in new offerings that drive the market process and may take the form of existing business growth, new ventures, or the creation of business activity within an existing firm (Fitz-koch et al., 2018), independently from the size of organizations (Wennekers & Thurik, 1999). Thus, some authors have linked the concept of agricultural entrepreneurship to the development of non-agricultural businesses by established farmers. In contrast, other authors have stated that agricultural activity also provides entrepreneurial opportunities such as the development of new products and innovations in the business process, distribution and marketing (Pindado & Sánchez, 2017).

To comprehend the key scientific contributions of the agricultural entrepreneurship field, we carry out a Systematic Literature Review (SLR). There are few in this domain, but the review conducted by Fitz-koch et al. (2018) is underlined since has identified three main research topics in the period between 1980 and 2015: identity, family and institutions. However, as this study includes empirical articles only from social sciences and is limited to the number of citations, it is necessary to conduct an ampler SLR. Hence, our study makes an original contribution since cover the period between 1969 and 2017, based on bibliometric analysis, that was not limited to a subject area or the number of citations. Furthermore, our study will compare the research on agricultural entrepreneurship in two different periods: the period until 2012, where there was a tendency to publish a lower number of articles, and the period 2013-2017 characterized by a higher number of articles. This comparative analysis will allow analysing which research topics are underlined in each period and even identify different

perspectives on the same topic in both periods. Thus, the objective of this research is to carry out a SLR, based on bibliometric analysis, to analyse how the research in agricultural entrepreneurship is approached in two different periods.

## **2.2. Literature review**

The founding figures of entrepreneurship theory, as Richard Cantillon and Jean-Baptiste Say, lived in a time when agriculture was the main industry and used examples related to agricultural practices of the 18<sup>th</sup> and 19<sup>th</sup> centuries (Vik & McElwee, 2011). Richard Cantillon coined the term “entrepreneur” in the mid-18th century for a farmer who undertakes to pay the owner, for his farm or land, a fixed amount of money with no guarantee of profit obtained from such activity, while Jean-Baptiste Say in the early 19th century associated the concept of the entrepreneur as a farmer that is not merely a bearer of risk but also a coordinator of the factors of production (Paradkar, Knight, & Hansen, 2015).

Entrepreneurial theories were enhanced in the 20th century. They can be grouped into three major intellectual traditions, each tracing its origin to Richard Cantillon but pointing at different aspects of the function of the entrepreneur (Hébert & Link, 1989; Wennekers & Thurik, 1999). The German tradition of von Thünen, Schumpeter and Baumol is the first, the (neo-)classical tradition of Marshall, Knight and Schultz is the second, and the third is the Austrian tradition of Menger, von Mises, and Kirzner. The (neo-)classicals underline the role of the entrepreneur in leading markets to equilibrium through their entrepreneurial activities; the German economists see the entrepreneur as a creator of instability and creative destruction, and the Austrians highlight the abilities of the entrepreneur to perceive profit opportunities, often after exogenous shocks (Wennekers & Thurik, 1999).

The entrepreneurship field must not be defined only in terms of who the entrepreneur is and what he or she does, since this definition does not consider the variation in the quality of opportunities that different people identify (Scott Shane & Venkataraman, 2000). Entrepreneurship is essentially a behavioural and attitudinal characteristic of persons and not an occupation (Wennekers & Thurik, 1999), reflecting a tendency to respond to the situational cues of opportunities and not a stable characteristic that differentiates some people from others across all situations (Scott Shane & Venkataraman, 2000).

Although the mainstream entrepreneurship research has overlooked the agricultural sector for an extended period (Fitz-koch et al., 2018), mainly due to the presence of complex mechanisms of market regulation and the perspective that agriculture is a particular case that must be analysed separately from other forms of economic activity (Alsos et al., 2011), the

entrepreneurial activity of farmers is essential to face the complex and multifaceted environment in which they operate (McElwee, 2006a). Hence, there are various exciting issues to analyse the literature about agricultural entrepreneurship. One of the most important topics is innovation, which is a distinctive aspect of entrepreneurship. The agricultural sector is dominated by small family firms, with many competitors and traditional products. Still, the liberalization of agricultural trade and Common Agricultural Policy (CAP) reforms since the 90s have led to more market-oriented agriculture (Giannakis & Bruggeman, 2015), with more agricultural entrepreneurs developing new products of higher food quality. An important example of this change is geographic indications, which provide growth opportunities for firms that implement proper strategies and for small firms operating in a niche market (Gellynck, Banterle, Kuhne, Carraresi, & Stranieri, 2012). In addition, agricultural units are becoming more productive by applying new technology (Micheels & Nolan, 2016). However, the nature and the type of technology or practice may change with the size of the agricultural firm (Rogers, 2004). Thus, innovation is part of the entrepreneurial behaviour of farmers, although it is essential to comprehend how their specificities are examined in the literature all over time.

On the other hand, some authors conclude that an increasing number of farmers have been looking in the last years for new strategies and sources of income besides core farm activities. However, other authors state that farm diversification is not a recent phenomenon since it has always been a distinctive feature of the agricultural sector (Alsos et al., 2011; Carter, 1998a; K. M. Vesala et al., 2007). In this sense, “diversification” and “pluriactivity” are two broad terms that have prevailed in the literature. Nevertheless, the boundaries between the two terms are not always clear, and other related terms arise in the literature about agricultural entrepreneurship. Besides the distinctions made between on-farm diversification (activity as part of the existing farm-based business entity) and off-farm diversification (new business ventures outside farming), agricultural pluriactivity is mirrored by the parallel concept of portfolio entrepreneurship, the simultaneous ownership of multiple businesses (Fitz-koch et al., 2018). Hence, it is needed to understand better how the analysis of these issues was evolved in the literature.

Space, where this type of entrepreneurship occurs, is another topic that needs further clarification. All forms of entrepreneurship, such as production in general, have a spatial dimension (Hudson, 2010) but agricultural entrepreneurship is generally associated with rural areas. According to Korsgaard, Muller, & Tanvig (2015), agricultural entrepreneurship implies a specific involvement with the rural-natural environment, which makes these entrepreneurs face particular challenges such as low levels of human and financial capital, relatively small markets and poor communications. However, agricultural entrepreneurship can be studied in

both rural and urban space. Although the urban environment has specific obstacles for farmers such as the difficulty of access to technical assistance (Pearson, Pearson, & Pearson, 2010) and soil contamination (Wortman & Lovel, 2013), urban agriculture has been gradually associated in terms of new business models and social entrepreneurship (Sanyé-Mengual, Oliver-Solà, Montero, & Rieradevall, 2015). Thus, there is a need to understand better the characteristics of agricultural entrepreneurship in rural and urban space.

### **2.3. Methodology**

To analyse the different research tendencies on the agricultural entrepreneurship field, we carry out a SLR. It is considered a well-established and appropriate methodological approach within the entrepreneurship domain (Henry, Foss, & Ahl, 2015), differing from traditional narrative reviews by adopting a replicable, scientific and transparent process, which improves the quality of the process and the results of the review (Tranfield et al., 2003). The research took place in 2018, focusing on articles from Scopus database which is considered the largest abstract and citation database of peer-reviewed literature, with more than 60 million records, covering over 21,500 peer-reviewed journals from over 5000 international publishers in different scientific areas (Baier-Fuentes et al., 2018; Palomo et al., 2017). Besides, Scopus has been used in several reviews and bibliometric analyses about entrepreneurship (Baier-Fuentes et al., 2018; Pato & Teixeira, 2016).

In the first phase, were selected articles that used the terms *agricultur\** or *farm\** in the title, abstract or keywords, in conjunction with *entrepreneur\**. Those terms are also included in the review of Fitz-Koch et al. (2017), resulting in an initial sample of 2581 documents. The review was limited to "Article" and "Review" documents, as both are the source of most up-to-date knowledge and probably have a greater impact on the field (Keupp, Palmié, & Gassmann, 2012; López-Fernández et al., 2016), so 2051 articles were obtained. Only articles with the language "English" were considered since the dissemination of scientific knowledge is fundamentally done in this language and is a criterium used in various reviews (López-Fernández et al., 2016), therefore the number of articles was reduced to 1813. After reading the abstracts and eliminating those that did not refer to agricultural entrepreneurship, the final number of articles was 272 (Table 2.1).

Table 2.1 - Research process

Research process	Step	Description	Result	
			1969-2012	2013-2017
<i>Scopus database</i>	1	SEARCH WORDS: (agricultur* OR farm*) AND entrepreneur*	2581 articles	
	2	DOCUMENT TYPE: “article” AND “review”	2051 articles	
	3	LANGUAGE: “English”	1813 articles	
	4	Read of abstracts and elimination of those that did not refer to agricultural entrepreneurship	272 articles	
	5	Division of the articles by two periods	110 articles	162 articles
<i>VosViewer software (Co-occurrences of terms)</i>	1	COUNTING METHOD: Binary	2602 terms	4169 terms
	2	MINIMUM NUMBER OF OCCURRENCES: 7 (1969-2012) and 8 (2013-2017)	65 terms	112 terms
	3	% OF THE MOST RELEVANT TERMS: 60%	39 terms	67 terms
	4	Exclusion of the irrelevant terms	14 terms	30 terms

For a better understanding of the field, we chose to divide the analysis into two periods: the period until 2012, where there was a tendency to publish a lower number of articles, and the period 2013-2017 characterized by a higher number of articles. The first period is constituted by 110 articles, while 162 articles are included in the second period. An Excel workbook was then prepared to record the raw data of these articles (López-Duarte, Vidal-Suárez, & González-Díaz, 2016).

The SLR is based on a bibliometric analysis, which is an established methodology for studying science, as a knowledge-generating system, and to assess research production in a specific field over a given period (Palomo et al., 2017). The bibliometric technique of co-words was used to examine the literature, where the unit of analysis is the article, and the variables are the terms included in the titles and abstracts of the articles identified in the Scopus database. This allows the description of the state-of-the-art research, resulting in mapping with the relations between the various terms and their association in thematic clusters (López-Fernández et al., 2016). The extraction of the terms is done using the software VOSviewer, where a term is understood as a sequence of names in text documents (van Eck & Waltman, 2011) and the distance between two terms is calculated using the association strength (van Eck & Waltman, 2007). In general, the stronger the relationship between two terms, the smaller the distance between the terms on the map (Heersmink, van den Hoven, van Eck, & van Berg, 2011). In previous studies, the details of the established methods and algorithms have been described (van Eck et al., 2010; Waltman et al., 2010). The colours indicate clustering of terms in thematic clusters, and terms with the same colour belong to the same cluster and tend to be

more closely related than terms of different colours. Thus, terms with the same colour tend to co-occur with each other more often than terms of different colours.

The bibliometric technique of co-words was performed separately in two periods: the period 1969-2012 and the period 2013-2017. The binary counting method was chosen, similar to the approach applied by Yeung, Goto, & Leung (2017), therefore that the number of occurrences of a term in a single document is not considered, only the presence or absence of that term in the document being identified. Attending that the articles examined are different in both periods, the minimum number of occurrences was fixed on seven for the period 1969-2012 and eight for the period 2013-2017. Although other studies define a different number depending on the topic examined (Olczyk, 2016), these numbers seem to be adequate in the present study since it allows to cover the more important terms in the literature about agricultural entrepreneurship in each period. Of these terms, VOSviewer calculated 60% (value automatically defined by the software's algorithm) of the most relevant terms in each period. After we removed the irrelevant terms, the final number of terms was fixed in 12 for the period 1969-2012 and 30 terms for the period 2013-2017.

The comparative analysis between the periods 1969-2012 and 2013-2017 will be made through two major areas: descriptive analysis and cluster analysis.

## **2.4. Descriptive analysis**

In the sample of the 272 articles published until 2017, it is possible to identify two main periods: the first until 2012, where the number of articles published is in average 2,5 articles per year, and the second between 2013 and 2017, where the number of articles published is always higher than 30 articles per year (Figure 2.1). Although the mainstream entrepreneurship research has largely overlooked the agricultural sector (Fitz-koch et al., 2018), in the last years, this scenario seems to change since 59,6% of the articles were published in the period 2013-2017. As with general entrepreneurship articles (Baier-Fuentes et al., 2018; Pato & Teixeira, 2016), the number of agricultural entrepreneurship articles has increased in the last years. This is not only because the literature on entrepreneurship is growing, but also because agricultural challenges are increasing, in both rural and urban areas, with new business models and social entrepreneurship initiatives.

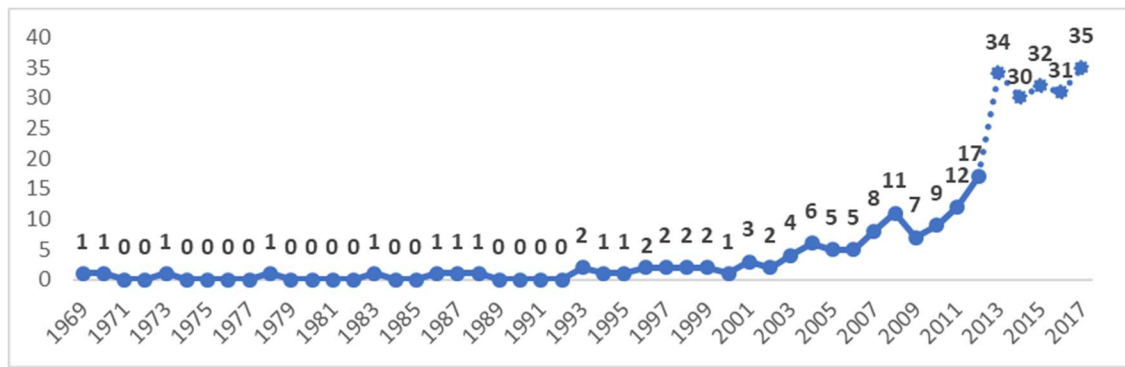


Figure 2.1 - Number of articles between 1969 and 2017

The first article dates from 1969 and is the only article published in this year. This study expresses concern about the shifts in entrepreneurial functions in agriculture of the 60s, namely the adjustments in small family farms due to the arising of vertical coordination contracts, farming corporations, and government programs (Harris, 1969). Nevertheless, today small family farms continue to be resilient, after decades of policy reform, agricultural restructuring, and the growth of vertical integration within the food and agri-business industries that have reshaped the sector into larger farm units (Fitz-koch et al., 2018). Despite the lower number of articles published in the period 1969-2012, the number of citations has significantly increased, mainly in the last years (Figure 2.2).

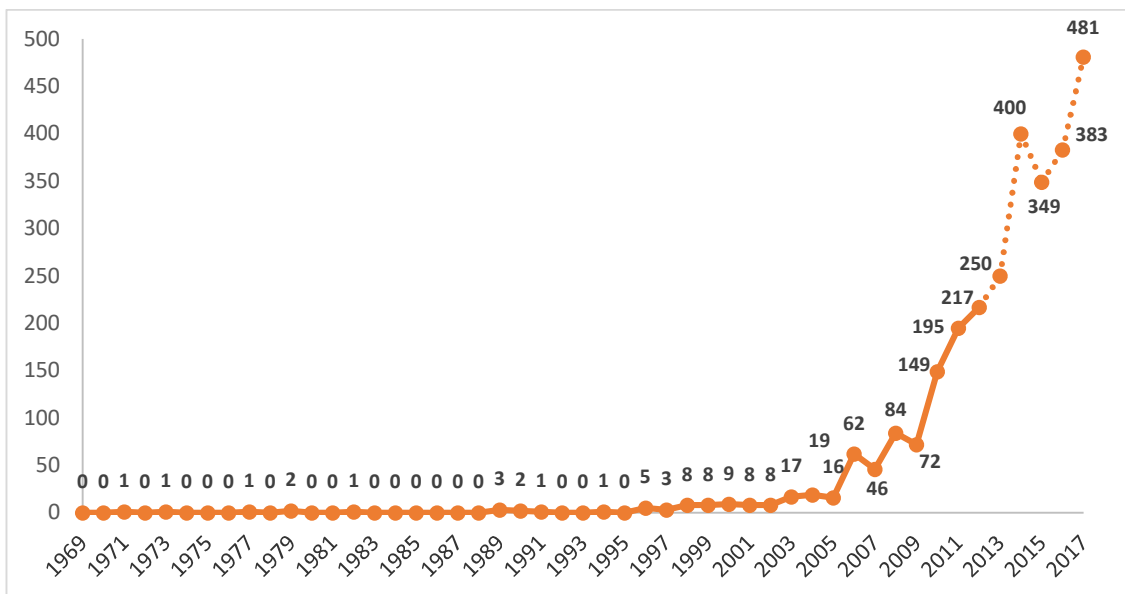


Figure 2.2 - Number of citations between 1969 and 2017

In both periods, "Social Sciences" and "Business, Management and Accounting" are the most important subject areas (Table 2.2). The main journals are the *Journal of Rural Studies*,

integrating articles from "Social Sciences" and "Agricultural and Biological Sciences" areas, and the *International Journal of Entrepreneurship and Small Business*, in the "Business, Management and Accounting" and "Economics, Econometrics and Finance" areas. However, the literature on agricultural entrepreneurship is characterized by a great diversity of journals, some of which are transversal to several areas of research, with a complexity of themes such as entrepreneurship, agriculture, food, marketing, tourism, quality and environment.

Table 2.2 - Main subject areas and journals

<b>PERIOD</b>	<b>1969-2012</b>			<b>Nº</b>	<b>2013-2017</b>			<b>Nº</b>
<b>Main Subject Areas</b>	Social Sciences			45	Social Sciences			62
	Business, Management and Accounting			44	Business, Management and Accounting			61
	Economics, Econometrics and Finance			34	Agricultural and Biological Sciences			54
	Agricultural and Biological Sciences			32	Economics, Econometrics and Finance			42
<b>Main Journals</b>	International Journal of Entrepreneurship and Small Business			7	Journal of Rural Studies			8
	Journal of Rural Studies			6	International Journal of Entrepreneurship and Small Business			5
	Entrepreneurship and Regional Development			4	Journal Of Developmental Entrepreneurship			5
	Journal of Small Business and Enterprise Development			4	International Food And Agribusiness Management Review			5
	Agrekon			4	Indian Journal Of Agricultural Sciences			5

In each period, more than 90 percent of the articles are empirical, but the quantitative studies predominate. Oppositely, the conceptual articles and the reviews are the categories with less importance (Table 2.3).

Table 2.3 - Methodology

<b>Methodology</b>	<b>1969-2012</b>		<b>2013-2017</b>	
	<b>Nº</b>	<b>%</b>	<b>Nº</b>	<b>%</b>
Empirical (Quantitative)	58	52.7	80	49.4
Empirical (Qualitative)	35	31.8	53	32.7
Empirical (Mixed)	8	7.3	16	9.9
Review	7	6.4	2	1.2
Conceptual	2	1.8	11	6.8
<b>Total</b>	<b>110</b>	<b>100</b>	<b>162</b>	<b>100</b>

Similarly to the review of Fitz-koch et al. (2018), the empirical studies are focused essentially on the European continent in both periods. However, their importance has diminished in the period 2013-2017 (Table 2.4). Despite the fact that the same authors refer that most of the studies were conducted in developed countries, our work notes the increasing importance of developing countries, essentially in Asia, where agriculture provides a large share of

employment and corresponding income to the rural population in those countries (Britz et al., 2012; Fitz-koch et al., 2018). In the period 1969-2012, the main countries analysed are the United States and the United Kingdom, while India, Italy and the Netherlands are highlighted in the period 2013-2017. In both periods, few articles include countries from more than one continent and even various countries from only one continent.

Table 2.4 - Empirical studies by continent, country and sector

<b>PERIOD</b>	<b>1969-2012</b>	<b>Nº</b>	<b>%</b>	<b>2013-2017</b>	<b>Nº</b>	<b>%</b>
<b>Continent</b>	Europe	52	51.5	Europe	58	38.9
	America	18	17.8	Asia	48	32.2
	Asia	16	15.8	Africa	19	12.8
	Africa	11	10.9	America	16	10.7
	Oceania	3	3	Oceania	6	4
	Various	1	1	Various	2	1.3
	<b>Total</b>	<b>101</b>	<b>100</b>	<b>Total</b>	<b>149</b>	<b>149</b>
<b>Country</b>	United States	15	14.9	India	19	12.8
	United Kingdom	14	13.9	Italy	12	8.1
	Norway	9	8.9	The Netherlands	10	6.7
	India	9	8.9	Iran	8	5.4
	Finland	6	5.9	United States	7	4.7
	The Netherlands	6	5.9	Divers	4	2.7
	Divers	2	2	Others	89	59.7
	Others	40	39.6	<b>Total</b>	<b>149</b>	<b>100</b>
	<b>Total</b>	<b>101</b>	<b>100</b>			
<b>Sector</b>	Agricultural sector	60	59.4	Agricultural sector	78	52.3
	Multifunctional Agriculture	15	14.9	Crop production	34	22.8
	Crop production	13	12.9	Livestock production	18	12.1
	Livestock production	8	7.9	Multifunctional agriculture	15	10.1
	Agricultural and non-agricultural sectors	5	5	Agricultural and non-agricultural sectors	3	2
	<b>Total</b>	<b>101</b>	<b>100</b>	Various agricultural subsectors	1	0.7
				<b>Total</b>	<b>149</b>	<b>100</b>

The word “agriculture” comes from Latin words *ager* referring to the soil and *cultura* corresponding to cultivation but “Agriculture”, in its widest sense, can be defined as the cultivation and production of crop plants or livestock products and is synonymous with “farming” (Rajarajeswari, 2016). Although the agricultural sector is heterogeneous with various subsectors and their specificities (Britz et al., 2012), the empirical studies about agricultural entrepreneurship globally analyse the agricultural sector, while comparative studies between various agricultural subsectors or between agricultural and non-agricultural sectors are the less studied. Also, farmers have developed new non-farm income-generating activities on farms (Alsos et al., 2011), which is also described as a multifunctional model of agriculture (Seuneke et al., 2013). This topic is approached in the literature only since 2004, focusing on the agritourism sector in European countries, which may be related with the European policies promoting diversification through the creation of non-agricultural businesses (Morgan, Marsden, Miele, & Morley, 2010). Although multifunctional agriculture

is represented by more studies than crop and livestock production in the period until 2012, wine and dairy sectors are the main sectors related respectively to crop and livestock production, in both periods.

The h-index of the literature on agricultural entrepreneurship is h-30 (Table 2.5), and the *Journal of Rural Studies* is the more represented journal in the index, with five articles. Most of all h-index studies are empirical, especially with a quantitative nature and conducted on European countries. Multifunctional agriculture has an important impact on the research field since it is analysed in 11 articles, including in the most cited study (McGehee & Kim, 2004), with 137 citations, which examines the different motivation among farm families operating agritourism in the United States. The importance of the innovation issue is reflected in the second most cited work, examining the linkages between the agricultural entrepreneurs and different kinds of innovation intermediaries (Klerkx & Leeuwis, 2008). All the h-index studies were published in the period 1969-2012.

Table 2.5 - H-index of the agricultural entrepreneurship literature (h-30)

<b>Citations</b>	<b>Study</b>	<b>Journal</b>	<b>Methodology</b>	<b>Country</b>
137	McGehee & Kim (2004)	Journal of Travel Research	Empirical - Quantitative	United States
119	Klerkx & Leeuwis (2008)	Food Policy	Empirical - Qualitative	The Netherlands
105	Barbieri & Mahoney (2009)	Journal of Rural Studies	Empirical - Quantitative	United States
99	Bergevoet et al., (2004)	Agricultural Systems	Empirical - Quantitative	The Netherlands
80	Carter (1998)	Entrepreneurship and Regional Development	Empirical - Quantitative	United Kingdom
74	Alsos, Ljunggren, & Toril Pettersen (2003)	Journal of Small Business and Enterprise Development	Empirical - Qualitative	Norway
73	Tew & Barbieri (2012)	Tourism Management	Empirical - Quantitative	United States
73	McGehee et al., (2007)	Tourism Management	Empirical - Quantitative	United States
73	Hinrichs, Gillespie, & Feenstra (2004)	Rural Sociology	Empirical - Quantitative	United States
73	Lyson, Gillespie, & Hilchey (1995)	American Journal of Alternative Agriculture	Empirical - Quantitative	United States
70	Bock (2004)	Sociologia Ruralis	Empirical - Mixed	The Netherlands
66	Morgan et al., (2010)	Journal of Rural Studies	Empirical - Qualitative	United Kingdom/ Italy
63	Barbieri & Mshenga (2008)	Sociologia Ruralis	Empirical - Quantitative	United States
61	Pennings & Leuthold (2000)	American Journal of Agricultural Economics	Empirical - Mixed	The Netherlands
58	Pritchard, Burch, & Lawrence (2007)	Journal of Rural Studies	Empirical - Mixed	Australia
57	Pyysiäinen, Anderson, McElwee, & Vesala (2006)	International Journal of Entrepreneurial Behaviour and Research	Empirical - Qualitative	Finland
55	Che et al., (2005)	Agriculture and Human Values	Empirical - Qualitative	United States
52	Vik & McElwee (2011)	Journal of Small Business Management	Empirical - Quantitative	Norway
49	K. M. Vesala, Peura, & McElwee (2007)	Journal of Small Business and Enterprise Development	Empirical - Quantitative	Finland
48	McElwee (2008)	International Journal of Entrepreneurship and Small Business	Conceptual	
46	Di Domenico & Miller (2012)	Tourism Management	Empirical - Qualitative	United Kingdom
44	H. T. Vesala & Vesala (2010)	Journal of Rural Studies	Empirical - Quantitative	Finland
44	Carter (1999)	Journal of Rural Studies	Empirical - Quantitative	United Kingdom
42	Grande et al., (2011)	Entrepreneurship and Regional Development	Empirical - Quantitative	Norway
40	Carter (2001)	International Journal of Entrepreneurial Behaviour & Research	Empirical - Quantitative	United Kingdom
38	Clark (2009)	Entrepreneurship and Regional Development	Empirical - Qualitative	United Kingdom
34	Haugen & Jostein (2008)	International Journal of Entrepreneurship and Small Business	Empirical - Quantitative	Norway
34	Phillipson et al. (2004)	Environment and Planning C: Government and Policy	Empirical - Quantitative	United Kingdom
32	Feenstra, Lewis, Hinrichs, Gillespie Jr, & Hilchey (2003)	American Journal of Alternative Agriculture	Empirical - Quantitative	United States
31	Ras & Vermeulen (2009)	Sustainable Development	Empirical - Quantitative	South Africa

## 2.5. Cluster analysis

To analyse the main themes in the literature on agricultural entrepreneurship, we used the co-words bibliometric technique on the titles and abstracts of the articles selected. Two periods are examined separately: the period 1969-2012 and the period 2013-2017. Through the software VOSviewer, the most relevant terms in the literature of each period were extracted, resulting in the mapping of relationships between the different terms and their association in thematic clusters. Terms belonging to the same cluster tend to be more closely related than terms of different clusters.

### 2.5.1. Period 1969-2012

In the period 1969-2012 (Figure 2.3), two thematic areas were identified in the literature: “Entrepreneurial Skills and Income Sources” (cluster 1); and “Market and Resources” (cluster 2).

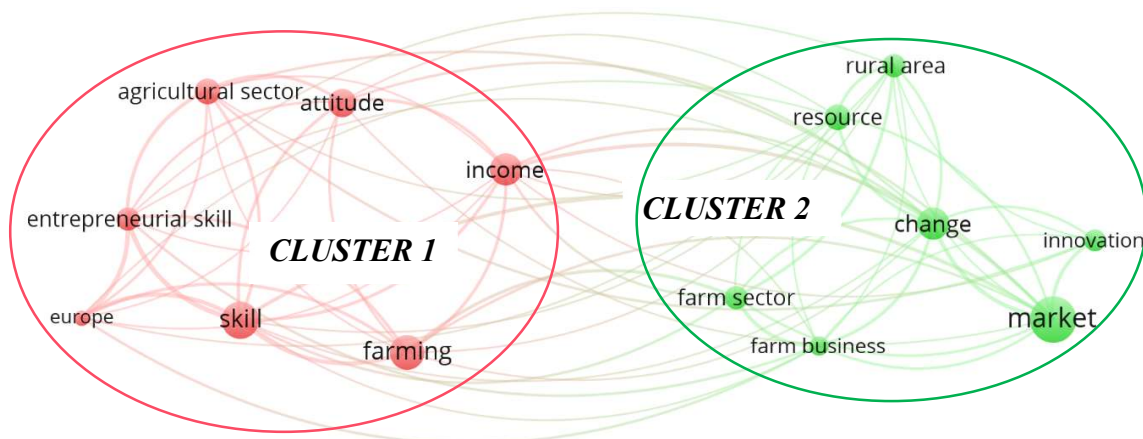


Figure 2.3 - Co-words mapping (1969-2012)

#### 2.5.1.1. Entrepreneurial skills and income sources

The literature on agricultural entrepreneurship is focused on entrepreneurial skills but, as the agricultural sector is heterogeneous, is especially complex to define and specify entrepreneurial skills (Pyysiäinen et al., 2006). Nevertheless, as a skill is related to the ability and the capacity to act (K. M. Vesala & Pyysiäinen, 2008), it is possible to specify what the entrepreneur is supposed to do and consequently to point out what kinds of skills are involved (Pyysiäinen et al., 2006).

The empirical studies about entrepreneurial skills are conducted mainly in European countries, concluding that European entrepreneurs require a large variety of skills to successfully manage an agricultural enterprise (Phelan & Sharpley, 2012), including professional, management, opportunity, strategic and cooperation/networking skills (de Wolf, McElwee, & Schoorlemmer, 2007). However, entrepreneurial skills should be distinguished from management skills (McElwee et al., 2006). Entrepreneurship is more than management since it is increasingly centred on innovation, risk-taking and the discovery and exploitation of opportunities (Phelan & Sharpley, 2012). Although successful business creation also requires management skills, it is the entrepreneurial attitude which allows perceiving opportunities (Couzy & Dockes, 2008).

Various factors influence farmers' entrepreneurial skills. Besides personal, locational and physical factors, entrepreneurial skills are determined by the type of socio-economic development and by the institutional support in rural economies (Morgan et al., 2010). As a series of major trends affect farm businesses and the lives of farmers in developed economies, there is a growing demand not only for changes in food production techniques but also in non-agricultural functions and services (Vik & McElwee, 2011). To face this scenario, farmers need to diversify and promote businesses which can increase their farm income and allow them to continue to live on the land (Pyysiäinen et al., 2006). According to some studies, conventional farmers are not as entrepreneurial as non-farm business owners or other farmers involved in business diversification, although entrepreneurial behaviour is possible to identify among conventional farmers (Carter, 2001; Pyysiäinen et al., 2006). Thus, entrepreneurial skills required for diversified farming are different from the ones required in conventional farming (McElwee et al., 2006; Pyysiäinen et al., 2006).

The main difference seems to be in the market relation since functional skills, such as salesmanship and marketing, are emphasised in diversified business (McElwee et al., 2006; Pyysiäinen et al., 2006). These skills are directly connected with social ties or networks (Pyysiäinen et al., 2006), as the diversified business was characterized by an abundance of factors related to dealing with other agents, such as customers, competitors, and employees (McElwee et al., 2006). Thus, cooperation and networking skills, innovative abilities, and risk-taking are important requirements to realize business opportunities (Vik & McElwee, 2011).

Agricultural entrepreneurs face specific obstacles to establish networks. Farms are generally located in rural areas with a less diverse business activity, which leaves farmers with fewer opportunities to network with other business communities (Rønning, 2011). Newcomers to farming face an additional challenge since they have difficulties to quickly form strong ties with

members of the rural community (Mailfert, 2007). Although informal personal ties with colleagues and business partners display a stronger relationship to the farm entrepreneurial success than formal membership in agricultural associations, those associations promote cooperation among farmers (Ortiz-Miranda, Moreno-Pérez, & Moragues-Faus, 2010; Pospěch & Spěšná, 2011) as well with other local and nonlocal actors (Ortiz-Miranda et al., 2010). Nevertheless, in sectors with numerous small primary producers and large national cooperatives at the processing level, the farmer has limited network links along the value chain, so farmers can be deprived of direct market signals (Rønning, 2011).

Developing entrepreneurial skills and attitude of farmers is a major challenge for the European agricultural sector, not only in diversified activities but also in core businesses (McElwee et al., 2006; K. M. Vesala et al., 2007). This requires economic support and a greater emphasis on education and training (de Wolf et al., 2007; McElwee & Smith, 2012; K. M. Vesala et al., 2007; Vik & McElwee, 2011). Yet, non-agricultural businesses may require different training models. In the case of agritourism, the development of training courses must consider not only that farmers must develop specific skills and competencies to remain competitive (Mancino & Lo Presti, 2012; Phelan & Sharpley, 2011, 2012), but also that agritourism entrepreneurs may have higher levels of education than other farmers, both concerning general education and agricultural education (Haugen & Jostein, 2008).

Research on the development of entrepreneurial skills of farmers is scarce in developing countries (Díaz-Pichardo, Cantú-González, López-Hernández, & McElwee, 2012), namely in Asian countries. However, entrepreneurship training programmes have a crucial role. In Malaysia, training programmes may attend to the specificities of each subsector, besides including generic skills such as motivation, administrative work, good farm management practices, agribusiness marketing and management skills (Morrison, Murray, & Ngidang, 2006; Rezai, Mohamed, & Shamsudin, 2011). Training should focus on the young farmers with lesser experience and education, while senior and experienced farmers can be used more efficiently as mentors to those younger farmers (Rezai et al., 2011). The development of generic entrepreneurship skills through training may be part of a broader national goal to eradicate poverty and raise rural incomes, such as a state-administered contract scheme in the Malaysian poultry sector (Morrison et al., 2006).

Although farmers lack many of the fundamental business competencies required for the success of non-agricultural businesses, they are increasingly turning to those activities as a means to generate additional income, especially agritourism in European Union (EU) and United States (Barbieri & Mahoney, 2009; Barbieri & Mshenga, 2008; Hernández-Mogollón,

Campón-Cerro, Leco-Berrocal, & Pérez-Díaz, 2011; McGehee & Kim, 2004; McGehee et al., 2007; Phelan & Sharpley, 2011, 2012). The farm and rural business support schemes and policy had been crucial to increasing entrepreneurship and diversification in farm businesses, in an effort to retain farmers in business, attract new entrants to agriculture and promote regional development (Barbieri & Mahoney, 2009; Pilař, Pokorná, Balcarová, & Hron, 2012; Vik & McElwee, 2011). Thus, the diversification to additional income sources for farm businesses had been largely examined in the literature about agricultural entrepreneurship, despite the fact that the employment of different definitions of agricultural diversification has promoted different typologies (Barbieri & Mahoney, 2009) (Table 2.6).

One of the first attempts to develop a formal typology of farm diversification is from Ilbery (1991), distinguishing between its agricultural and structural forms, and was applied in various studies on agricultural entrepreneurship (Carter, 1998a, 1998b, 1999, 2001; Walford, 2003). Based on the conceptualization of diversification of Ilbery (1991), the study from Barbieri & Mahoney (2009) went further and proposed eight forms of diversification. The study from McElwee & Smith (2012) also defines three main farm-based groups of additional income sources for farm businesses (agricultural diversification, farm-based visitor facilities and other farm-based businesses). Still, the agricultural diversification group do not include the same activities mentioned in the typology defined by Ilbery (1991). Other classifications may be focused on whether the activity takes place on-farm (activity as part of the existing farm-based business entity) and off-farm (new business ventures outside farming) and are adapted to the country analysed.

In addition to different classifications, different terms besides diversification are used in the literature to examine the multiple income sources of farm households, namely pluriactivity, portfolio entrepreneurship and even multifunctionality. Despite various definitions, diversification may be defined as on-farm or farming-related activity, which provides goods or services based on-farm resources and so excludes off-farm work or employment (Vik & McElwee, 2011). Hence, diversification refers particularly to business activity and should not be confused with pluriactivity, which is a more general term related to income generation and includes paid work as well as business diversification (H. T. Vesala & Vesala, 2010).

Table 2.6 - Main classifications of additional income sources for farm businesses

Concept used / Authors	Framework
Diversification (McElwee & Smith, 2012)	<p><b>1) Agricultural diversification</b></p> <ul style="list-style-type: none"> <li>• Diversification into alternative products in the form of novel crops (e.g., industrial non-food crops, such as short rotation coppice for energy production) and novel livestock (e.g., venison, ostriches, rabbits) and other types of production (e.g., organic production).</li> <li>• Adding value to agricultural products through processing and packaging.</li> <li>• Alternative marketing of agricultural products, e.g., direct marketing, farmers' markets, farm shops, delivery rounds, pick your own and quality assurance schemes (QAS). Supply of agricultural labour and/or machinery contracting services to other farms/businesses.</li> </ul> <p><b>2) Farm-based visitor facilities</b></p> <ul style="list-style-type: none"> <li>• Farm-based accommodation (bed and breakfast, self-catering, camping, caravanning/bunkhouse/camping barns)</li> <li>• Farm-based recreation/leisure/education/catering facilities (farm parks, sports, golf, tea rooms etc.)</li> </ul> <p><b>3) Other farm-based businesses:</b> Workshop facilities; storage facilities (furniture, warehousing, caravans etc.); services such as kennels, livery etc.; passive lets (letting buildings to other businesses); consultancy and professional services.</p>
Diversification (Barbieri & Mahoney, 2009)	<p><b>1)</b> Introduction of non-traditional crops, livestock or the adoption of unusual agricultural practices, such as organic agriculture and free-range pastures into the farm.</p> <p><b>2)</b> Utilization of a variety of direct marketing and merchandising activities, and the use of a mix of communication and promotional media designed to make ranch and farm products and services more readily accessible to different markets, including the use of on-farm retailing and the Internet to advertise and sell farm products.</p> <p><b>3)</b> Integration of recreation, tourism and hospitality enterprises offered on farms, including the direct purchase of agriculture products on-site (e.g., on-farm markets), recreational self-harvesting of the farm products (e.g., fruits, flowers), participation in recreation activities and events (e.g., tours, festivals and weddings), dining at on-farm restaurants and stays in various types of farm and ranch accommodations (e.g., bed and breakfasts and cottages).</p> <p><b>4)</b> Lease, rental, easements and timeshares of the farm and its resources (i.e., land, buildings and equipment), including the rental of vineyards for weddings, ranch timeshares, as well as recreation and conservation easements.</p> <p><b>5)</b> Farmers and ranchers providing contract services (e.g., ploughing, planting, caring for horses, farm management).</p> <p><b>6)</b> Value-added, including the processing or packaging of the agriculture product, such as the freeze-drying of flowers, and holiday gift packaging of regional farm products.</p> <p><b>7)</b> Historic preservation involves the restoration of old buildings, structures and farm equipment and adaptive re-use as part of revenue-producing or supporting activities, including, for example, the conversion of old barns into theatres, shepherd shacks into cottages, or the use of vintage tractors to power hayrides.</p> <p><b>8)</b> Consulting and educational activities include classes (e.g., herbs growing), workshops (e.g., winemaking), internships and apprenticeships on the farm.</p>
Diversification/ Portfolio entrepreneurship (Carter, 1998a, 1998b, 1999, 2001; Ilbery, 1991; Walford, 2003)	<p><b>1) Agricultural diversification:</b></p> <ul style="list-style-type: none"> <li>– Unconventional enterprises (crop products, animal products and organic products)</li> <li>– Farm woodland projects (for energy, amenity, wildlife and timber)</li> <li>– Agricultural contracting (for other farmers and non-agricultural organizations)</li> </ul> <p><b>2) Structural diversification (non-farming activities):</b></p> <ul style="list-style-type: none"> <li>– Tourism (accommodation and recreation)</li> <li>– Adding value to farm enterprises (direct marketing and processing)</li> <li>– Passive diversification (leasing of land and buildings)</li> </ul>

Concept used / Authors	Framework	
Diversification (Vik & McElwee, 2011)	<p>ON-FARM DIVERSIFICATION</p> <p><b>1) On-farm and farm-related</b></p> <ul style="list-style-type: none"> <li>• Firewood, bioenergy production, etc.</li> <li>• Farm-based sawmill</li> <li>• Hiring out of hunting and/or fishing rights</li> <li>• Hiring out of premises and storeroom</li> </ul> <p><b>2) On-farm and farm-diverse</b></p> <p><i>a) Agritourism</i></p> <ul style="list-style-type: none"> <li>• Lodging or accommodation</li> <li>• Adventures, tours, guiding, etc. (tourism)</li> <li>• Serving of food on or by the farm</li> <li>• Local food</li> </ul> <p><i>b) Social farming</i></p> <ul style="list-style-type: none"> <li>• Green care, relieving, etc.</li> <li>• Training courses and pedagogic services</li> </ul>	<p>OFF-FARM DIVERSIFICATION</p> <p><b>1) Off-farm and farm-related</b></p> <ul style="list-style-type: none"> <li>• Machine contracting, haymaking, snow clearing, etc.</li> <li>• Construction work</li> <li>• Organized rural service</li> <li>• Husbandry on other farms</li> </ul> <p><b>2) Off-farm and farm-diverse</b></p> <ul style="list-style-type: none"> <li>• Consulting and accounting services</li> <li>• Fishery</li> <li>• Aquaculture</li> </ul>
Diversification/ Pluriactivity (Rønning & Kolvereid, 2006)	<p><b>1) Farm-related enterprises:</b> Food production, Custom work with farm machinery, Agritourism</p> <p><b>2) Non-farm-related enterprises:</b> Building operations, Construction Machinery, Transport, Accounting, Auditing, Consulting</p>	
Diversification (Niska, Vesala, & Vesala, 2012; H. T. Vesala & Vesala, 2010; K. M. Vesala & Peura, 2005; K. M. Vesala et al., 2007)	<p>Agritourism, food processing, handicraft, wood processing, energy production, machine contracting, fur farming, production of metalware, health services, transportation and retail trade in farm products</p>	

Farm diversification is closely related to portfolio entrepreneurship, whereby a person or group engages in multiple business ownership (Haugen & Jostein, 2008). In this sense, multifunctional farmers may be considered portfolio entrepreneurs since they simultaneously own and develop multiple businesses (Carter, 1998a; Seuneke et al., 2013). Multifunctionality underlines the tasks of agriculture beyond food and fibre production, such as processing, and provision of tourism, leisure or care services (Niska et al., 2012). However, farm entrepreneurs must be analysed differently from other sectors as their multiple businesses are not necessarily different legal entities (Vik & McElwee, 2011).

Farm diversification is not a new phenomenon since several agricultural scholars have reported that many farm businesses combine agricultural production with other income-generating activities, which always been a distinctive feature of the agricultural sector (Carter, 1998a; K. M. Vesala et al., 2007). Increasing gross income is important, especially during non-growing seasons, because it generates the cash flow needed to pay continuing fixed costs, such as mortgages, taxes and equipment payments (Barbieri & Mshenga, 2008). The farm owners with several businesses had distinctive personal characteristics since they were both more likely to be younger and better trained in agriculture, management, marketing and finance than their monoactive peers (Carter, 1998a). In agritourism, entrepreneurs are more commonly women and married, and it is a reflex from a household strategy rather than an

individual farmer strategy (Haugen & Jostein, 2008). Hence, some authors defend that the entrepreneurship literature needs to focus on multiple income sources of the entrepreneur, so the entire household should be included in the analysis of entrepreneurial processes (Carter, 1999; Rønning & Kolvereid, 2006).

Annual income has a positive and significant relationship with the entrepreneurial behaviour of farmers (Shakya, Badodiya, Garg, & Daipuria, 2010; Subrahmanyeswari, Reddy, & Rao, 2007) since people with low incomes tend to encounter significant obstacles in identifying and exploiting entrepreneurial opportunities (Shelton, 2010). Thus, it is important to understand the composition of the annual income of farm households.

External employment and holding additional non-farm-related businesses (Building operations, Construction machinery, Transport, Accounting, auditing, consulting) are significantly positively related to household income, which shows that diversification into other economic sectors has a positive effect on income (Rønning & Kolvereid, 2006). However, the income potential of on-farm diversification appears uncertain, since the study of Rønning & Kolvereid (2006) could not indicate any positive effects, while the study from Clark (2009) concludes the contrary, stating that off-farm employment provides an extremely minor component of income in comparison to that contributed by on-farm diversification since in most cases spouses had responsibility for diversification activities. Women have as main goals obtaining extra income to support their families and to finance farm investments (Bock, 2004). In the case of agritourism, women are more highly motivated than their male counterparts, but both indicated a desire for additional income (McGehee et al., 2007).

A substantial part of the literature on agricultural entrepreneurship was centred on the entrepreneurial skills of farmers and their sources of income, highlighting the complexity of the agricultural sector as well as the different strategies followed. Farmers can be considered as entrepreneurs and as decision-makers who aim to maximize profits, especially through the combination of agricultural production with other income-generating activities (Carter, 1998a; McElwee, 2006a; Phillipson et al., 2004). Nevertheless, some farmers have limited abilities to adjust to new business strategies successfully and to exploit their opportunities fully (Grande, 2011). The development of entrepreneurial skills depends significantly on the change of attitude towards a more open vision of the agricultural activities, especially facing the market, and the construction of self-concept as an entrepreneur (Díaz-Pichardo, Cantú-González, & López-Hernández, 2010).

### **2.5.1.2. Market and resources**

The research on agricultural entrepreneurship had also shown a great interest in the way how farmers had adapted in the last years to the changes in the agricultural sector, as well as the resources used by them. In many countries, especially in EU, farm firms have traditionally operated within a very different political and economic environment from non-agricultural firms, since agricultural activities have been governed by a separate set of policy objectives, political institutions, and support agencies (Phillipson et al., 2004). However, trade liberalisation since the early 1990s have tried to reduce farmers' dependence on public sector support, and align the agricultural sector more closely with global markets (Morgan et al., 2010; Phillipson et al., 2004). There are entrepreneurial opportunities under subsidy regimes, but market liberalisation has provided important challenges for farmers to reorganise and to develop new market and business configurations (Morgan et al., 2010).

The success of entrepreneurs depends on their access to resources and their ability to exploit them (Grande, 2011). Many farmers did not adapt to the need for cost efficiency and scale increase in agriculture, the high price offered for land near cities and industrial centres, and the decreasing income levels, which led to a decreasing number of farmers as well their growing age (de Wolf et al., 2007). Nevertheless, other farmers are adapting to the new changes and focusing their attention on the identification and exploitation of opportunities for niche markets, add value to their products, or improve systems of cooperation (Phillipson et al., 2004).

Despite the increase of large farms, the agricultural sector is still dominated by small family farms around the world. As labour usage varies considerably between different types of agriculture, and at different times of the year (such as harvest or shearing periods) (Pritchard et al., 2007), many farms only hire seasonal and not permanent employees (Mancino & Lo Presti, 2012), which makes difficult to manage the human resources along the year. Various studies indicate that entrepreneurial activity is easier when human and physical resources can be transferred from an initial economic activity to another business activity (Haugen & Jostein, 2008). Available labour capacity, especially farmer's women labour, has been important for starting up the ventures since somebody has to devote time to work with planning, starting up and finally running the new venture (Bock, 2004; Grande, 2011). Yet, the management of a portfolio of businesses requires more employees in comparison with monoactive farmers (Barbieri & Mshenga, 2008; Carter, 2001).

Financial resources are important to the short and long-run performance of farm firms since they are essential in running the firm daily as well as for long-term investments, and may be a

source of competitive advantage for those firms which have greater access to financial capital than their competitors (Grande, 2011; Grande et al., 2011). However, as farm firms with high entrepreneurial orientation use their limited resources creatively, financial resources may have an impact on performance only in the short run (Grande et al., 2011). One way to overcome financial difficulties in the long run, namely securing borrowings from bank and demand fluctuations in the agricultural markets, may be signing multi-year contracts with large retailers or processors (Pritchard et al., 2007). Governmental funding and support are also essential, mainly in the EU, to promote diversification to non-agricultural businesses (Morgan et al., 2010). However, this may not be enough to give these firms a superior competitive advantage, as many other comparable farm businesses have access to a similar type of funding (Grande, 2011).

The land is a crucial resource to the agricultural activity and can be examined in terms of farm size (Grande et al., 2011). The size of farms differs substantially within and between regions, and due to legislation and tradition of inheritance, farmland is not easily traded in many countries (Breckenridge & Taplin, 2005; Grande et al., 2011). Compared to smaller farms, larger farms may benefit from economies of scale, are generally better equipped in terms of buildings and machinery (de Wolf et al., 2007), and have more likelihood to the benefit of diversifying activities such as agritourism (Barbieri & Mshenga, 2008; Carter, 2001). Scale increase is one of the main strategies adopted in Europe, which allows not only to be competitive with other farmers in terms of price but also to meet the demands of supermarkets and retailers for continuous and large supply (de Wolf et al., 2007). Yet, when farm firms possess a relatively high entrepreneurial orientation, farm size seems to have an impact on performance only in the short run (Grande et al., 2011). Farm owners perceived shortage of available land to be a great constraint to firm growth and development, but the creative use and integration of external local resources may partly compensate for lack of resources (Carter & Rosa, 1998; Grande, 2011).

The relative location of land might be important, as firms located nearby to populated areas may obtain a higher profit than others due to lower transportation costs and easier access to consumers (Grande et al., 2011). In this sense, many farms engaged in new business ventures rely on adjacent markets for selling their products, as tourism (attractive landscape and farm surroundings adjacent to populated areas), food processing for local markets, and direct sales to consumers through farmers' markets and farm shops (de Wolf et al., 2007; Grande et al., 2011). However, the association between a favourable location of the firm and its performance may not be significant, since today modern communication has reduced this barrier (Grande et al., 2011). Some customers may feel that farms that are far away from urban centres have

more to offer compared to those that are nearer (Nakana & Mkhabela, 2011). When farmers adopt on-farm diversification, physical resources are not sufficient conditions to give these firms a superior competitive advantage but, combined with the farm setting, these resources may add value and uniqueness to the final product, namely its traditional production, its relative location, buildings and landscape (Grande, 2011).

In the agricultural sector, firms depend heavily on property endowments and natural resources in their production (Grande et al., 2011). Uneven access to natural resources may give firms a significant competitive advantage, but entrepreneurial activities have direct impacts on the depletion of non-renewable resources and ecosystems (Grande et al., 2011; Ras & Vermeulen, 2009). Water is a resource of strategic importance in agricultural activity, although there are countries where it is very serious the problem of shortage of water, such as Mexico. Hence, governmental entrepreneurship programmes may be crucial to training all farmers to use water efficiently and pay the fair amount for their consumption, so that the aquiferous resources are preserved, and the agricultural activity can be developed (Díaz-Pichardo et al., 2010).

The concern with the conservation of natural resources had led to changes in the world policy and support, through increasingly strict legislation for agricultural production, which restricts the use of some important production factors such as pesticides, nutrients and energy (de Wolf et al., 2007). Large food retailers around the world require the introduction of various business-to-business environmental schemes, essentially to medium and large producers. However, some are promoted only by an individual firm, such as Tesco's Nature's Choice, and others by joint sector activities, such as GlobalGAP (Muller, Vermeulen, & Glasbergen, 2009). Many farmers are also engaged in organic production, not only small but also large producers, both in developed and developing countries. Small producers sell a great part of this production locally (Larsson, 2012), while large producers sell essentially to large retailers (Ras & Vermeulen, 2009).

In developing countries, the importance of sustainable agriculture has increased since the 80s with the implementation of rural public projects. Farming systems are focused more on the efficient use of local resources (plants, animals, soil, water, climate, people), so that they complement each other and have the greatest synergistic effects, using external inputs only to the extent that they are needed (J. Khan & Knight, 1997). In this sense, innovation in small farm agriculture had been essential to achieving this efficiency and higher profits, which may be associated with drip irrigation, improved propagation techniques, as well as marketing strategies.

Some authors state that farmers seek more strongly niche-markets for special products in developed countries or regions with high land and labour costs, where farmers are less competitive in bulk product markets, namely by producing under an exclusive certification (organic schemes, the origin of products, traditional production process), growing varieties with a special taste, processing and packaging (de Wolf et al., 2007). However, in the last years, producers from developing countries are increasing their interest in niche-markets through product and marketing innovations (Antonites & Haguma, 2011; Ras & Vermeulen, 2009) since with current globalisation, innovation is no longer a luxury but a necessity (Antonites & Haguma, 2011).

In the agricultural sector, networks are crucial to support innovation. With the privatization of agricultural research and extension establishments worldwide, different kinds of innovation intermediaries can facilitate the formation and maintenance of innovation networks, assisting agricultural entrepreneurs in articulating demand, forge linkages with those that can provide innovation support services, and manage innovation processes (Klerkx & Leeuwis, 2008). Funding via European programmes combined with the use the consultation from private bureaus are preponderant, especially the investments in Information and Communication Technologies (ICTs) since this is a key factor in driving innovation in companies, driving productivity growth and competitiveness, and creating jobs (Mueller, 2001; Tsekouropoulos, Andreopoulou, Samathrakis, & Grava, 2012).

Networks allow to agricultural entrepreneurs use their professional and social relationships to get the resources they need to launch a business, acquiring them more cheaply than they could through markets (Mailfert, 2007), including human (Rønning, 2011) and marketing resources (Micheels & Gow, 2008). The membership to agricultural cooperatives or other producer organizations is essential in the case of a pronounced structural fragmentation of holdings since it contributes to add value to specific territorial resources, besides reallocate resources between farmers and the cooperative (workload or materials) (Ortiz-Miranda et al., 2010). This type of cooperation is also identified as a solution to combat the power of large retailers, attending to the demand for a high-quality standard for the lowest possible prices from their producers (de Wolf et al., 2007). In the agritourism sector, participation in agriculture and tourism associations can assist in mobilising external resources from third parties, such as access to technology, customers, financial resources and shared marketing (Barbieri & Mshenga, 2008), besides contributing to maintain land in agriculture and reinforce local image (Che et al., 2005).

Thus, the agricultural sector has been affected by many changes in the last years. Farms are growing in size, increasing mechanisation and automation, and production levels are still increasing (de Wolf et al., 2007). However, the success in establishing new ventures is not only based on better resources alone, but rather through recombining existing farm resources into new uses and supply necessary external resources and knowledge needed for their new businesses (Grande, 2011).

### **2.5.2. Period 2013-2017**

In the period 2013-2017 (Figure 2.4), three different topics were identified: “Entrepreneurial Skills and Behaviour” (cluster 1); “Entrepreneurial Strategies” (cluster 2); and “Community and Entrepreneurial Activity” (cluster 3).

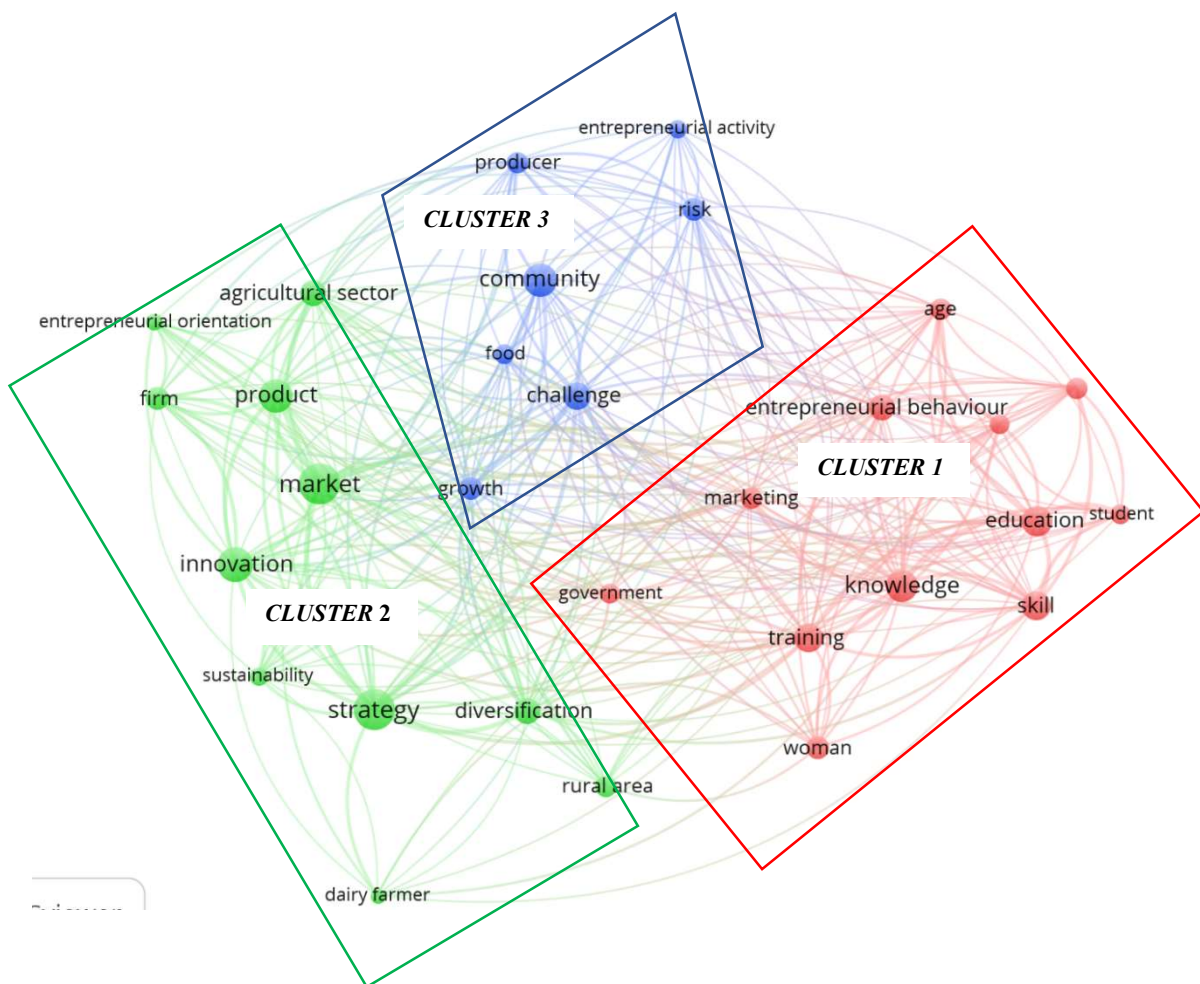


Figure 2.4 - Co-words mapping (2013-2017)

### **2.5.2.1. Entrepreneurial skills and behaviour**

Although several studies indicate that agricultural entrepreneurs have lower entrepreneurial skills than entrepreneurs in other economic activities, since they keep apart from the market because of the heavy regulation of this sector, other studies conclude that agricultural entrepreneurs do possess entrepreneurial skills, particularly those involved in diversification activities, which determines their entrepreneurial behaviour (Pindado & Sánchez, 2017). The learning process has been fundamental to the development of these skills, especially the development of an entrepreneurial identity in farmers to operate beyond the agricultural domain and to open up family farms through external labour and social networks (Pindado & Sánchez, 2017; Seuneke et al., 2013). Hence, the literature on agricultural entrepreneurship has been centred on better understand entrepreneurial skills (Seuneke et al., 2013) and the behaviour of farmers.

Education negatively influences the decision to become an agricultural entrepreneur comparing with other sectors (Pindado & Sánchez, 2017). Still, education is a determinant of entrepreneurial quality, since individuals with a high level of education are characterized by increased intrinsic motivation and dynamic behaviours, and are more likely to achieve success in entrepreneurship (Guzmán & Santos, 2001), including in the agricultural sector (Gurjar, Gour, Dwivedi, & Badodiya, 2017; Isiorhovojaq, 2013; Rosairo & Potts, 2016; Salau, Adua, Maimako, & Alanji, 2017; Singh, Sharma, & Dahiya, 2013; Yadav, Chahal, Singh, et al., 2014). As entrepreneurial capabilities can be learned through education and training (Kuratko, 2005) and entrepreneurial attitudes are determined more by education than age and gender in the agricultural sector (Rosairo & Potts, 2016), interest has emerged in the literature about the development of entrepreneurship programmes, essentially in higher education institutes (Table 2.7).

Although individuals with higher knowledge prefer to start a business in other sectors (Hormiga, Batista-Canino, & Sánchez-Medina, 2011), various studies suggested the importance of entrepreneurship education projects to provide agricultural students with entrepreneurial skills not only in developing countries, such as India (B Lekang, Nain, Singh, Sharma, & Singh, 2017; Bushe Lekang, Nain, & Singh, 2017; Bushe Lekang, Nain, Singh, & Sharma, 2016) or Iran (Mohammadinezhad & Sharifzadeh, 2017), but also in developed countries, such as Spain (Ortiz-Medina et al., 2014), Australia, New Zealand and United States (Mehlhorn, Bonney, Fraser, & Miles, 2015). Considering that the entrepreneurial intentions of students who had attended entrepreneurship courses are higher, agricultural colleges must integrate entrepreneurship into their educational programs (Pouratashi, 2015), with the

inclusion of various disciplines such as management, economics, marketing and technology (Bushe Lekang et al., 2017).

Table 2.7 - Agricultural entrepreneurship programmes

<b>Study</b>	<b>Methodology</b>	<b>Target of the programme</b>	<b>Country</b>	<b>Continent</b>
Lourenço et al., (2014)	Empirical Qualitative	- Women farmers	Uganda	Africa
Williams & Hovorka (2013)	Empirical Mixed	- Young farmers	Botswana	Africa
Raman et al., (2014)	Empirical Qualitative	- Young farmers	Malaysia	Asia
Sampedro-Hernández & Vera-Cruz (2017)	Empirical Qualitative	- Young farmers	Mexico	America
Weissman (2015)	Empirical Qualitative	- Young urban farmers	United States	America
Palmås & Lindberg (2013)	Empirical Qualitative	- Organic farmers	Sri Lanka	Asia
Bonney, Collins, Miles, & Verreynne (2013)	Empirical Qualitative	- Farmers with food security problems	Papua Guinea	New Oceania
Lekang, Nain, & Singh (2017)	Empirical Quantitative	- Students of agricultural universities	India	Asia
Lekang, Nain, Singh, & Sharma (2016)	Empirical Quantitative	- Students of agricultural universities	India	Asia
Lekang, Nain, Singh, Sharma, & Singh (2017)	Empirical Quantitative	- Students of agricultural universities	India	Asia
Mohammadinezhad & Sharifzadeh (2017)	Empirical Quantitative	- Students of agricultural universities	Iran	Asia
Ortiz-Medina et al. (2014)	Empirical Mixed	- Students of agricultural universities	Spain	Europe
Mehlhorn et al., (2015)	Empirical Mixed	- Students of agricultural universities	Australia, New Zealand and the United States	Oceania and America

Differently from other sectors, younger people are less likely to become entrepreneurs in the agricultural sector (Pindado & Sánchez, 2017) but younger farmers are more productive and achieve higher profitability, investment and engagement in Agri-environmental schemes (Hamilton, Bosworth, & Ruto, 2015; Sutherland, Toma, Barnes, Matthews, & Hopkins, 2016). On the contrary, older farmers have greater resistance to change and are less likely to promote diversification activity and adopt new technology (Morris et al., 2017). In particular, the development of non-agricultural businesses is associated with younger farmers since it requires new skills and knowledge that are often not readily provided by the traditional agricultural support systems (Hassink, Grin, Hulsink, & Hassink, 2016; Renting et al., 2008). Thus, governmental training programmes are essential to promote youth involvement in agricultural businesses and improve their entrepreneurial skills, especially in developing countries (Raman et al., 2014; Sampedro-Hernández & Vera-Cruz, 2017; Williams & Hovorka,

2013), where young entrepreneurs face specific obstacles, as negative stereotyping, deeper socioeconomic barriers and perceived lack of spirit (Williams & Hovorka, 2013). Youth entrepreneurship programmes are also promoted in developed countries, namely in poor urban neighbourhoods, attending to the importance of urban agriculture in educating youth about food and promoting alternative food networks (AFNs) (Weissman, 2015).

Considering that there is a significant application of high technology in agriculture (Cavallo et al., 2014), the technological capacities of agricultural entrepreneurs are crucial to the identification and exploration of opportunities. Despite agri-technology training programmes, though the government support, are positively associated with the entrepreneurial behaviour of farmers (Dahlan, Mappigau, & Khaerani, 2014), producers need to take the initiative instead of relying only on traditional government-based support mechanisms. Still, technology programmes must give additional training and support to develop entrepreneurial skills (Bosworth, McElwee, & Smith, 2015). There are entrepreneurship programs for young farmers in less developed countries that provide both entrepreneurial and technological capacities, with positive results (Raman et al., 2014; Sampedro-Hernández & Vera-Cruz, 2017) but it is needed to expand those programs to other farmers and other countries. Nevertheless, the training programs must consider the particular training requirements of the different agricultural subsectors, such as mushroom (Shirur, Shivalingegowda, Chandregowda, & Rana, 2017), vegetable (Yadav, Chahal, Singh, et al., 2014), poultry (Salau et al., 2017), dairy (Beldman, Lakner, & Smit, 2014; Singh et al., 2013; Yadav, Chahal, Kumar, & Singh, 2014) and oil palm (Koyenikan & Anozie, 2017) sectors.

Non-governmental organizations (NGOs) also implement important entrepreneurship training projects in less developed countries, due to their specific characteristics as the rapid growth of population, increasing urbanization and rising demand for the use of agricultural resources for alternative sources of energy such as biofuels (Bonney et al., 2013; Palmås & Lindberg, 2013). Those projects explore a more entrepreneurial perspective and innovation in agricultural value chains, in an attempt to improve entrepreneurial skills and increase food security, reframing the problem as an opportunity for farmers to appropriate value while helping to meet basic human needs (Bonney et al., 2013). Nevertheless, an entrepreneurship programme to spread organic farming in Sri Lanka has failed, which may be related with the insufficient duration of this programme to help farmers become ecologically and economically successful as organic farmers (Palmås & Lindberg, 2013).

Men's participation rates in entrepreneurship are consistently higher than the women's (Arenius & Minniti, 2005), including in the agricultural sector (Pindado & Sánchez, 2017) but

women play an important role in family farms. In developed countries such as The Netherlands, women are deeper involved in non-agricultural businesses of family farms since, compared to their male partners, women seemed to cross the boundaries of agriculture more easily (Seuneke et al., 2013), and consequently it is essential the women's role in the learning process by which farmers gain the necessary knowledge and skills to switch towards multifunctional entrepreneurship on family farms (Seuneke & Bock, 2015). On the other hand, in Sweden, some women had off-farm employment before becoming farm tourism entrepreneurs, which means that they do not move from a position as farm woman to entrepreneur but rather from employed to entrepreneur, contrary to previous studies in other countries, what it may be related to a wish for more independence and to work from home (Pettersson & Cassel, 2014).

The barriers for entrepreneurship in developing countries are more pronounced than in the developed Western world (Welter, 2011), mainly for women, including lack of access to credit, gender inequality, poor infrastructure, lack of access to knowledge and education, negative attitudes towards women, and few initiatives to facilitate economic and business success (Lourenço et al., 2014). Despite the positive and significant association between market orientation and the entrepreneurial behaviour of farmers (Gurjar et al., 2017; Singh et al., 2013), women entrepreneurs are identified as a particular group that needs marketing training in developing countries such as Nigeria (Koyenikan & Anozie, 2017; Ojo, Anitsal, & Meral Anitsal, 2015) and India (Yadav, Chahal, Singh, et al., 2014; Yadav, Chahal, Kumar, et al., 2014). Hence, it is essential the implementation of gender training programmes for entrepreneurship since they ensure that women can gain rewards from agriculture and improves gender equality in agriculture (Lourenço et al., 2014), as well microfinance interventions since they improve access to credit and business performance, contributing to a higher standard of living for women agricultural entrepreneurs (Nukpezah & Blankson, 2017).

Although the literature about agricultural entrepreneurship has been focused more on developed countries (Fitz-koch et al., 2018) and entrepreneurial skills (Seuneke et al., 2013) and behaviour, this topic has been analysed, in the period between 2013 and 2017, essentially in developing countries. Researchers underline the relevance of entrepreneurship programmes to provide agricultural students and farmers, especially younger and women farmers, with entrepreneurial skills.

### **2.5.2.2. Entrepreneurial strategies**

The research about agricultural entrepreneurship, in the period between 2013 and 2017, was also focused on entrepreneurial strategies. The increasing number of farmers focused in

diversification on farms, motivated by the changing demands from society and the desire to take advantage of new opportunities, have led many researchers continue to examine this topic (Hassink, Hulsink, & Grin, 2016), especially the diversification related to non-agricultural businesses.

There are tensions between maintaining a focus on the current agricultural activity or pursuing diversification (Morris et al., 2017). Still, diversification increases the number of possibilities for farm success (Methorst, Roep, Verhees, & Verstegen, 2016). As the family plays an important role in the entrepreneurial strategies of farms, diversification to non-agricultural activities may be associated with other farming household members (Morris et al., 2017), especially women (Seuneke & Bock, 2015). Besides, the sustainability issue may influence the choice for a particular non-agricultural business essentially agritourism since, compared with other farm entrepreneurial ventures, agritourism is more successful in increasing farm profits, creating jobs and conserving the natural and cultural heritage, producing multiple environmental, socio-cultural and economic benefits for their farms, households and even society (Barbieri, 2013).

Diversification is related not only to the development of non-agricultural businesses but also to agricultural production, mainly crop production, but this diversification is faced differently by farmers of developing and developed countries. Farmers in a developing economy, although often without formal management training, realise that they need to become more entrepreneurial and develop crop diversification since these strategies limit the probability of pest damages and crop losses (Bosworth et al., 2015; Di Falco & Perrings, 2005). In developed countries, there is a tendency of specialisation of crops to maximise profit (Jaeck & Lifran, 2013), although the same crop can have various cultivars with different agronomic characteristics. The choice of the cultivar portfolio is very similar to the choice of the crop portfolio, as the cultivar portfolio structure depends not only on structural characteristics and constraints of the farm but also on the market-driven variable, so the management of crop diversity or cultivar diversity has a strong impact on the economic performance of farming and agricultural environment (Jaeck & Lifran, 2013).

Considering livestock production, agricultural entrepreneurs also seems to pursue different strategies in developed and developing countries, especially in the dairy sector. In developed countries, expand milk production and the entrepreneurs often chose further specialisation as a focus for the development of the farm (de Lauwere, Malak-Rawlikowska, Stalgiene, Klopčič, & Kuipers, 2014; Methorst et al., 2016), namely through the genetic improvement of breeds. In developing countries, such as Ethiopia that increasingly imports dairy products, dairy

farmers develop new products like cheeses, butter or yoghurts, besides milk production (Steen & Majjers, 2014). Attending to various problems associated with quality of livestock products, especially the increase in numbers of food contamination cases and the BSE (Bovine Spongiform Encephalopathy) crisis, the adoption of food quality labels is a valuable opportunity for livestock farmers. Still, it may depend on previous experience with other quality programs and active participation in relationship networks (Vinholis, Filho, Carrer, & Chaddad, 2015).

Agricultural entrepreneurs also search for diversification of marketing channels. In recent years, many farmers have adopted short supply chains to sell their food products, especially in European countries with numerous traditional and local products (Tudisca, Trapani, Sgroi, & Testa, 2014). Alternative food networks (AFNs) are a response to the dominant food-producing system (Venn, Kneafsey, Holloway, Cox, & Dowler, 2006), where agricultural entrepreneurs play an important role in ensuring high-quality products while promoting environmental conservation and the wellbeing of individuals and society (Migliore, Schifani, Romeo, Hashem, & Cembalo, 2015), namely through direct sales and farmers' markets (Migliore et al., 2015; Tudisca, Trapani, Sgroi, et al., 2014). AFNs have positive effects especially in farms of small-medium size, as long as farmer's family mostly manages them, but the AFNS must be combined with long supply chain with the increase of farm size (Tudisca, Trapani, Sgroi, et al., 2014). Direct sales are the main AFN used by agricultural entrepreneurs but, as produced quantities cannot be absorbed exclusively by local demand, must be used in conjunction with traditional sales methods, such as fruit and vegetable wholesale markets and contracts with Large Organized Distribution (Tudisca, Trapani, Sgroi, & Testa, 2015). Farmers' markets are other important AFN although, as its number has increased along with the number of farms selling a part of their production through farmers markets, these farm businesses need to further differentiate themselves from competition for continued success (Micheels & Boecker, 2017).

Differentiation strategies are adopted by agricultural entrepreneurs, especially through the development of brands, although branding may depend on the type of product. In this era of branding everything and everyone, a branding strategy in the agricultural sector may be based on country-of-origin, product attributes, variety, the growing region's climate or value-added processing (Stanton & Herbst, 2005). However, fresh products, differently from packaged food, are still often marketed as unbranded commodities where the grower accepts the price offered and does not use innovation to differentiate their product in the market (Lewis et al., 2014). Hence, branding fresh products is an attractive opportunity for leveraging strategic innovation and disrupt traditional market strategies, namely highlighting the provenance of the product (Lewis et al., 2014). Other alternative is processing fresh products and

consequently developing new products, such as guava sector in India, where production is higher than the demand, especially during the peak period (Tripathi & Agarwal, 2014). New products may be developed as sweets or liquors and, in the case of packaged food, the branding strategies are more easily implemented.

There are specific agricultural subsectors where the final goal is processing the agricultural product, such as grapes in wine, and consequently, specific entrepreneurial strategies are pursued. The small wine grape farms, despite playing an important socio-economic role in regions such Sicily in Italy, do not transform nor bottle their product because they confer the grapes directly to wine cooperatives, obtaining a low sales price (Chinnici, Pecorino, Rizzo, & Rapisarda, 2013). Thus, the competitive advantage of small wine enterprises could be achieved by lowering the production costs, through the investment in process innovations, as the reduction of pruning costs by power-assisted pruning tools that facilitate vineyard management (Filippo Sgroi, Testa, Tudisca, & Di Trapani, 2016).

When structural and economic conditions permitted higher investments, generally in medium and large enterprises, the integration of supply chain is a common strategy adopted, to reach wine consumers directly and to succeed against the competitors in a wide and globalised market (Maumbe & Brown, 2013; Tudisca, Trapani, Donia, Sgroi, & Testa, 2014). In this case, branding strategies are crucial, namely through geographical indications (Maumbe & Brown, 2013; Tudisca, Trapani, Donia, et al., 2014) as Protected Designation of Origin (PDO) and Protected Geographic Indication (PGI) labels in European Union (Tudisca, Trapani, Donia, et al., 2014). Nevertheless, even for small businesses, geographic indications are potentially a unique form of competitive advantage (Hajdukiewicz, 2014) and dynamic local institutions are needed to encourage innovation and entrepreneurship in PDOs farms, improving the sustainability of rural areas (Egea & Pérez y Pérez, 2016).

One of the issues less examined in this cluster is Entrepreneurial Orientation (EO) (Table 2.8). Still, EO is paramount to examine the entrepreneurial strategy-making processes that main decision-makers use to adopt their organizational goal, sustain its vision, and create a competitive advantage (Rauch, Wiklund, Lumpkin, & Frese, 2009). The main theoretical basis of EO is that the entrepreneurially oriented firms are different from the others (Kreiser, Marino, & Weaver, 2002). All empirical studies about EO have a quantitative nature and are focused on Asian and American countries, essentially Malaysia and Canada. The EO is operationalized from multiple ways although there seems to exist an increasing consensus in the mainstream literature that the construct is formed by three dimensions: innovativeness, risk-taking and proactiveness (Rauch et al., 2009). In the agricultural sector, those three

dimensions are also examined (Fahim & Baharun, 2017; Ishak, Omar, & Moen, 2015; Pindado & Sánchez, 2017; Veidal & Flaten, 2014a), despite other studies assume different dimensions. Lumpkin and Dess (1996) suggested that two additional dimensions were relevant to OE, namely autonomy and competitive aggressiveness, and the studies from Hosseini & Eskandari (2013) and Mahindaratne & Gunaratne (2015) adopt their suggestion. Finally, Gellynck et al., (2015) opt for examining only one dimension (innovativeness), while Mirzaei, Micheels, & Boecker (2016) and Micheels & Boecker (2017) analyse three specific dimensions (proactiveness, innovativeness and competitive aggressiveness).

Table 2.8 - Empirical studies about Entrepreneurial Orientation

<b>Studies</b>	<b>Sector of activity</b>	<b>Country</b>	<b>Continent</b>	<b>EO dimensions</b>
Micheels & Boecker (2017)	Agriculture	Canada	America	Proactiveness, innovativeness and competitive aggressiveness
Pindado & Sánchez (2017)	Agricultural and non-agricultural sectors	European countries	Europe	Risk-taking, proactiveness and innovativeness
Fahim & Baharun (2017)	Agriculture	Malaysia	Asia	Innovativeness, risk-taking and proactiveness
Mirzaei, Micheels, & Boecker (2016)	Agriculture	Canada	America	Proactiveness, innovativeness and competitive aggressiveness
Ishak, Omar, & Moen (2015)	Agriculture	Malaysia	Asia	Innovativeness, risk-taking and proactiveness
Mahindaratne & Gunaratne (2015)	Vegetable sector	Sri Lanka	Asia	Autonomy, innovativeness, risk-taking, proactiveness, and competitive aggressiveness
Gellynck et al., (2015)	Banana sector	Ecuador	America	Innovativeness
Veidal & Flaten (2014)	Agriculture	Norway	Europe	Innovativeness, risk-taking and proactiveness
Hosseini & Eskandari (2013)	Agriculture	Iran	Asia	Autonomy, innovation, proactiveness, and risk-taking, competitive aggressiveness

The large majority of the studies concludes that EO contributes positively to the organizations' performance (Rauch et al., 2009), including in the agricultural sector (Fahim & Baharun, 2017; Gellynck et al., 2015; Hosseini & Eskandari, 2013; Micheels & Boecker, 2017; Veidal & Flaten, 2014a). In addition, EO contributes positively to rates of product and marketing innovations (Micheels & Boecker, 2017) and innovation capability (Fahim & Baharun, 2017), while there is a positive association between the farmer's innovative entrepreneurial orientation and absorptive capacity (Gellynck et al., 2015). On the other hand, environmental turbulence increases the degree of EO in agricultural firms (Mirzaei et al., 2016), despite EO is significantly different across various farm business models (Mahindaratne & Gunaratne, 2015) and new entrants into agriculture are more entrepreneurially oriented than established ones (Pindado & Sánchez, 2017).

The agricultural sector is not a homogeneous one, but one which is inserted in a complex environment (McElwee, 2006a; Smith, McElwee, & Somerville, 2017). The agricultural entrepreneur can choose between different strategies, based on the diversification of agricultural and non-agricultural businesses, innovation or market channels, depending substantially on factors such as country, type of product and size. However, it is necessary to understand better EO in the agricultural sector, namely under what circumstances an increased EO can lead to increased performance (Veidal & Flaten, 2014a).

### **2.5.2.3. Community and entrepreneurial activity**

The agricultural entrepreneur faces a great deal of uncertainty due to the instability of agricultural markets. The unpredictability of weather conditions, which directly affects his income and makes him more averse to risk, besides family firms can be more risk-averse due to their change resistance to and their fear of losing their family wealth (Chavas & Holt, 1996; Naldi, Nordqvist, Sjöberg, & Wiklund, 2007). However, risk aversion in the European agricultural sector is not greater than in other sectors (Pindado & Sánchez, 2017), as the agricultural entrepreneur seem to adapt to new challenges such changes in consumer habits, food safety, biotechnology (Lans et al., 2017), as well as developmental challenges in rural communities (Ranjan, 2015). Hence, context is fundamental, and risk assumption can be a key factor to survive in dynamic environments where costumers' preferences and technology change rapidly, while in static environments firms may benefit from more conservative, risk-averse approaches (Pindado & Sánchez, 2017; Rauch et al., 2009).

Agricultural activity is based on biological processes with high spatial and temporal variability. Still, this variability is increasing since climate change has profound impacts on agriculture, requiring adaptation by agricultural entrepreneurs to maintain the agricultural production capacity of food, fibre and energy (Koyenikan & Anozie, 2017; Quiroga & Iglesias, 2009). On the other hand, as the agricultural activity depends on land as a production factor, this activity has more impact on the environment than other sectors (Britz et al., 2012; Pindado & Sánchez, 2017) and the local communities pay particular attention to this impact.

Although agriculture is the largest emitter of greenhouse gases contributing to global warming, this sector has contributed to the solution of this problem through carbon sequestration and production of renewable energy (H.-C. Lee, McCarl, Schneider, & Chen, 2007; Mbzibain, Tate, & Shaukat, 2015). The increase in organic farming in the last years, oriented to market niches, also play an important role and have been driven by ideologically committed farmers to biodiversity and sustainability, as well government support in developed countries (Anzaku & Salau, 2017; D'Oronzio & Pascarelli, 2016; Palmås & Lindberg, 2013; Schwindenhammer,

2017). However, new entrants into agriculture, in comparison with established farmers, seems to adopt more these commitment since they pursue specific values such as a farm lifestyle or sustainable agriculture (EIP-AGRI, 2016; Pindado & Sánchez, 2017).

The availability of land is an important contextual factor connected to farm growth since land is not widely available for purchase, and renting is often the only option (Stenholm & Hytti, 2014). In urban farms, there are additional constraints related to land, namely the relatively small acreage of urban farms places, higher land costs, water prices and regulatory barriers (Oberholtzer, Dimitri, & Pressman, 2014), besides soil contamination from lead and pathogens present in stormwater can be a significant risk (Wortman & Lovel, 2013). In this sense, urban agriculture may take place on public and institutional land, supported by municipalities and civil society initiatives (Delgado, 2017) and appears in various forms, with urban farms located on roofs, food is grown in soil, hydroponically or through the method of aquaponics (Specht et al., 2014), in greenhouses, hoop houses, raised beds, and containers, using organic production (Dimitri, Oberholtzer, & Pressman, 2016).

Until a few years ago, the research on urban agriculture was centred in developing countries, as a way of poor satisfying their food needs (Dimitri et al., 2016) but, in the last years, the focus has changed to developed countries from Europe and North America. Hence, research on agricultural entrepreneurship follows this tendency. Beyond the mechanisms of food production and the focus on profits, many urban farms in those countries have a model of social entrepreneurship that highlights the social benefits created by the business (Delgado, 2017; Dimitri et al., 2016; Recasens, Alfranca, & Maldonado, 2016; Weissman, 2015). The urban agriculture initiatives can be a way to generate jobs for youth at the time of crisis or include goals such as educating consumers about food and agriculture, local food systems, supporting local communities and reducing food insecurity in underserved neighbourhoods (Delgado, 2017; Dimitri et al., 2016). There are similarities among urban farms with social missions and market-oriented urban farms, including farm sales, use of organic production methods and location in the urban core. However, the farms with social missions are more likely to locate in lower-income neighbourhoods, donate a higher share of their production and less likely to own land (Dimitri et al., 2016).

The entrepreneurial activities of farmers have brought economic impacts to society, both for the people who are directly involved with the farms and for their surrounding communities (Asmit & Koesrindartoto, 2015). However, today, in developed countries, the community has for agricultural products larger and more differentiated expectations (F. Sgroi, Di Trapani,

Testa, & Tudisca, 2014) since the farmer is seen as an agent that contributes to the economy in many ways (Morris et al., 2017).

## **2.6. Discussion**

To better understand the main thematic areas analysed in the literature on agricultural entrepreneurship, it is important to compare the period 1969-2012 with the period 2013-2017 (Table 2.9). The literature on agricultural entrepreneurship is grouped in two thematic clusters in the period 1969-2012, while three clusters are identified in the period 2013-2017.

The period 2013-2017 is characterised by a higher level of complexity of the literature, although entrepreneurial skills are examined in both periods. Although the analysis of training programs in developing countries have less importance in the literature in the period 1969-2012, this theme is largely examined in the period 2013-2017, where those programs are targeted not only to farmers but also to agricultural students in higher education institutes. In the period 1969-2012, entrepreneurial skills are analysed conjointly with income sources essentially in developed countries, since skills required for diversified farming are different from the ones required in conventional farming (McElwee et al., 2006; Pyysiäinen et al., 2006). Researchers were concerned with the demonstration that farmers can be considered as entrepreneurs and as decision-makers who aim to maximize profits (Carter, 1998a; McElwee, 2006a; Phillipson et al., 2004), developing different typologies of agricultural diversification.

The concern with the decrease of income in the agricultural sector was emerged especially after the II World War, in a period where the agricultural policy and the farming industry promoted the increase of productivity and efficiency of farm units, which resulted in a lower income to smaller and less efficient farms (Rønning & Kolvereid, 2006) that demonstrate a lack of knowledge about new technology (Aguilar-Gallegos, Muñoz-Rodríguez, Santoyo-Cortés, Aguilar-Ávila, & Klerkx, 2015). A more market-oriented economic policy since the 90s, with the decline of farm subsidies, as well the growing power of supermarkets and industrial food processors has reinforced even more this situation (Cameron, 2007; Giannakis & Bruggeman, 2015; Rønning & Kolvereid, 2006). Despite a growing number of small farms in developed countries are looking for additional sources of income, besides primary production (Bock, 2004), other entrepreneurial strategies besides diversification are examined in the period 2013-2017, namely differentiation strategies through the development of brands based in the provenance of a product. Furthermore, the literature examines the social entrepreneurship initiatives at urban agriculture since, besides the focus on profits, many urban farms highlight the social benefits created by the business in the local communities (Delgado, 2017; Dimitri et al., 2016; Recasens et al., 2016; Weissman, 2015).

Table 2.9 - Comparative analysis between the periods 1969-2012 and 2013-2017

<b>1969-2012</b>	<b>2013-2017</b>
<p><b>“ENTREPRENEURIAL SKILLS AND INCOME SOURCES”</b></p> <ul style="list-style-type: none"> <li>-Entrepreneurial skills and income sources are examined essentially on European countries and the United States</li> <li>-Researchers had employed different definitions and typologies of agricultural diversification, as well as different terms related to that, namely pluriactivity and portfolio entrepreneurship.</li> <li>-Entrepreneurial skills required for diversified farming are different from the ones required in conventional farming, namely salesmanship and marketing skills, which is directly connected with social ties or networks</li> <li>-Although farmers lack many of the entrepreneurial skills required for the success of non-agricultural businesses, they are increasingly turning to those activities to generate additional income</li> <li>-The farm owners with a portfolio of businesses are more likely to be younger and better trained in agriculture, management, marketing and finance than their monoactive peers</li> <li>-The income of on-farm diversification appears to be uncertain, but, in most cases, farmer’s spouses had responsibility for diversification activities.</li> <li>-The development of entrepreneurial skills requires economic support and a greater emphasis on education and training</li> </ul>	<p><b>“ENTREPRENEURIAL SKILLS AND BEHAVIOUR”</b></p> <ul style="list-style-type: none"> <li>-Entrepreneurial Skills and Behaviour are examined essentially in developing countries</li> <li>-As agricultural entrepreneurs seem to have less entrepreneurial skills than other sectors, there is a concern about the improvement of those skills through the implementation of entrepreneurship programmes, targeted not only to farmers but also to agricultural students in higher education institutes.</li> <li>-Education and training positively influence entrepreneurial behaviour in the agricultural sector, although training requirements differ across different agricultural subsectors.</li> <li>-Training courses must attend to the gender role in the family farms, as men generally focus on agricultural production, while women begin and develop new activities.</li> <li>-Young farmers must benefit from entrepreneurship programmes since, on the contrary to other sectors, younger people are less likely to become an entrepreneur in the agricultural sector.</li> </ul>
<p><b>“MARKET AND RESOURCES”</b></p> <ul style="list-style-type: none"> <li>-This cluster focuses on countries from Europe, America and Africa, examining how the farmers had used the resources to adapt to the changes in the agricultural sector in the last years</li> <li>-Human resources, land and financial resources are analysed in developed countries, while natural resources are examined in both developed and developing countries</li> <li>-As the agricultural sector is based essentially on family labour, farmers’ women labour is crucial to start up new ventures</li> <li>-Labour usage varies considerably at different times of the year, such as harvest, which makes difficult to manage the human resources along the year</li> <li>-Land size and financial resources seem to have an impact on performance only in the short run when farm firms possess a relatively high entrepreneurial orientation</li> <li>-Governmental funding is an important part of financial resources</li> <li>-The public concern with the conservation of natural resources and the requirements of large food retailers had led farmers to adopt various sustainable product certification schemes, such as organic production and GlobalGAP</li> <li>-Networks may allow agricultural entrepreneurs to use their social and professional relationships to get the resources they need to launch and run a business, such as innovation, financial resources and shared marketing</li> </ul>	<p><b>“ENTREPRENEURIAL STRATEGIES”</b></p> <ul style="list-style-type: none"> <li>-Entrepreneurial Strategies of farmers are analysed mainly in developed countries, although it can be based in the diversification of agricultural and non-agricultural businesses, innovation or market channels.</li> <li>-The diversification to non-agricultural businesses by established farmers is the most analysed strategy in the literature, especially agritourism and care farms.</li> <li>-The farming household members, mainly women, play a crucial role in the development of non-agricultural businesses.</li> <li>-Diversification may also be associated with different agricultural products or different marketing channels.</li> <li>-Alternative Food Networks (AFNs), as direct sales and farmers’ markets, have positive effects in farms of small-medium size</li> <li>-Another strategy used is based on differentiation, mainly through the development of brands. However, fresh products are often marketed as unbranded and do not use innovation to differentiate their product in the market.</li> <li>-Branding strategy based on the provenance of a product is increasingly used, namely through geographical indications.</li> </ul>
	<p><b>“COMMUNITY AND ENTREPRENEURIAL ACTIVITY”</b></p> <ul style="list-style-type: none"> <li>-This cluster focuses essentially on the impacts of food production in communities of developed countries,</li> </ul>

1969-2012	2013-2017
	highlighting the social entrepreneurship initiatives at urban agriculture. -The agricultural activity depends on land as a production factor which leads to various constraints faced not only by the agricultural entrepreneurs but also by the communities. -The agricultural activity has more impact on the environment than other sectors, and the local communities live more closely those impacts. -In urban farming, soil contamination can be an additional risk, and the lack of land is more pronounced -Urban agriculture is associated with new business models and social entrepreneurship since, besides the focus on profits, the social benefits are underlined.

In the period 1969-2012, the literature was also focused on the way how farmers had used resources to adapt to the changes in the agricultural sector in the last years. Human resources, land and financial resources are analysed in developed countries, while natural resources are examined in both developed and developing countries. Attending to the public concern with the conservation of natural resources and the requirements of large food retailers, various farmers are adopting various sustainable product certification schemes, such as organic production and GlobalGAP, essentially since the beginning of the 21st century (Larsson, 2012; Ras & Vermeulen, 2009).

In the period 2013-2017, the environmental impacts of agricultural activity are analysed only in developed countries but, as the local communities pay more attention to those impacts, organic production is associated with urban agriculture and with Alternative food networks (AFNs). Those networks are especially important to small farms since providing the possibility of selling food products through short supply chains and the elimination of intermediaries, mainly through direct sales and farmers' markets (Tudisca, Trapani, Sgroi, et al., 2014). Nevertheless, more studies are needed to examine the resources and capabilities of agricultural entrepreneurs (Pindado & Sánchez, 2017).

## **2.7. Conclusions**

In the present study, a SLR of agricultural entrepreneurship was carried out, based on bibliometric analysis. In this sense, two different periods were examined: the period until 2012, where there was a tendency to publish a lower number of articles, and the period 2013-2017 characterized by a higher number of articles. In the first period, it was possible to group the literature into two main themes ("Entrepreneurial Skills and Income Sources" and "Market and Resources") while, in the period 2013-2017, the research was grouped into three main

topics (“Entrepreneurial Skills and Behaviour”, “Entrepreneurial Strategies” and “Community and Entrepreneurial Activity”).

In the period 1969-2012, the literature on agricultural entrepreneurship has been focused on the entrepreneurial skills of farmers and their sources of income, essentially in European countries. The role of the farmer in Europe has changed, with the development of non-agricultural businesses, and farmers have to develop new skills to be competitive (McElwee, 2006b). Researchers had employed different definitions and typologies of agricultural diversification (Barbieri & Mahoney, 2009), as well as different terms related to that, namely pluriactivity and portfolio entrepreneurship. Nevertheless, the income potential of on-farm diversification appears uncertain (Clark, 2009; Grande, 2011; Rønning & Kolvereid, 2006), since the core business of the farm can be damaged with disproportionate amounts of time and effort oriented into secondary businesses, which may not obtain a reasonable financial return (McElwee, 2008).

Attending to the increasing liberalization of agricultural markets, the literature in the first period also focuses on the ways how farmers had recombined existing farm resources into new uses namely land, human, financial and natural resources. According to various studies focused on established farmers, starting new ventures can be relatively easy as a result of the physical assets, namely land and machinery (Pindado & Sánchez, 2017), as well the available labour capacity, especially farmer’s women labour (Bock, 2004; Grande, 2011). The consumer demand for environmental products (Ras & Vermeulen, 2009) has led to the introduction of various sustainable product certification schemes in the market, such as organic production and GlobalGAP, contributing to preserving natural resources (Larsson, 2012; Ras & Vermeulen, 2009). Financial resources are also important to the performance of farm firms, including government funding and support, mainly in the EU (Grande, 2011; Grande et al., 2011).

In the period 2013-2017, the research on agricultural entrepreneurship maintains an important focus on entrepreneurial skills (Seuneke et al., 2013). However, this issue is more examined in developing countries in the last years. As agricultural entrepreneurs seem to have less entrepreneurial skills than other sectors (Pindado & Sánchez, 2017), there is a concern about the improvement of those skills namely through the implementation of entrepreneurship programmes, targeted not only to agricultural students in higher education institutes but also to women and young farmers. Entrepreneurial strategies of farmers are analysed mainly in developed countries. However, it can be based in the diversification of agricultural businesses, non-agricultural businesses or market channels, depending

considerably on factors such as country, type of product and size. Another strategy used is based on differentiation, mainly through the development of brands. Still, there are differences between products since fresh products are often marketed as unbranded, differently from packaged food (Lewis et al., 2014). Nevertheless, highlighting the provenance of a product is a branding strategy increasingly used in different products, namely through geographical indications (Lewis et al., 2014; Tudisca, Trapani, Donia, et al., 2014).

In the period 2013-2017, researchers underline the important influence of the entrepreneurial activity of farmers in the communities, especially the environmental impacts (Pindado & Sánchez, 2017). In urban farming, despite the soil contamination can be an additional risk (Wortman & Lovel, 2013) and the lack of land is more pronounced (Dimitri et al., 2016; Specht et al., 2014), urban agriculture is associated with new business models and social entrepreneurship (Sanyé-Mengual et al., 2015).

Comparing the periods 1969-2012 and 2013-2017, we conclude that entrepreneurial skills are underlined in both periods, but, in the period 2013-2017, new research topics were introduced. In the first period, researchers defined various typologies of agricultural diversification in developed countries, stating that entrepreneurial skills required for diversified farming are different from the ones required in conventional farming. In the period 2013-2017, as the development of entrepreneurial skills requires a further emphasis on education and training, the literature had examined various entrepreneurship training programs essentially in developing countries. However, the sector is so diverse in terms of geography, topography, location, that common solution cannot be provided (McElwee, 2006b). In this sense, differentiation strategies and social entrepreneurship initiatives at urban agriculture are highlighted by the researchers in the last years. Thus, it is essential to understand agricultural entrepreneurship in its many aspects, considering that it covers an activity with specificities that must be considered by the researchers.

## **2.8. Limitations and future research lines**

This study has some limitations. In the first place, only articles included in the Scopus database are examined, which excludes conference papers, books and book chapters. The option to compare specific temporal periods is also a limitation. In the bibliometric analysis, the definition of a minimum number of occurrences of terms avoids all terms from being identified as well as the relation between them.

Future research should continue to examine what skills farmers need, according to farmers and stakeholders (Vik & McElwee, 2011). Considering that younger people are less likely to

become an entrepreneur in the agricultural sector (Pindado & Sánchez, 2017), entrepreneurship programmes directed to young farmers and students at agricultural universities must continue to be examined, especially teachers' skills to disseminate appropriate entrepreneurial skills (Mohammadinezhad & Sharifzadeh, 2017), moreover the influence of agricultural entrepreneurs on agricultural student attitudes (J.-H. Wang, Chang, Yao, & Liang, 2016), not only in developing but also developed countries. It is also crucial to understand how new entrants and established agricultural business owners acquire entrepreneurial capabilities, to create or improve specific educational and training programs considering their characteristics and the specificities of the sector (Pindado & Sánchez, 2017; Seuneke et al., 2013). As the strong regulatory environment of the agricultural sector affects the skills and the behaviour of the intervenient, future research should consider indicators of start-up subsidies and other support measures (Pindado & Sánchez, 2017).

More research into entrepreneurial strategies is necessary to understand under what circumstances or among which type of farms an increased EO can lead to increased performance (Veidal & Flaten, 2014a). Future research must also examine the factors identified as relevant in farm's innovation activities such as size, education, experience, location, the strategic posture of the farmer (conventional or organic) and its membership activity in producer association (Gellynck et al., 2015). Further research must examine motivations, practices and business outcomes related with diversification strategies (Tonner & Wilson, 2015), although the sustainability issue must be extended to farms with only agricultural businesses (Barbieri, 2013). Considering the great heterogeneity of agricultural units national and regionally, due to the differences in natural factors and infrastructure as well as different management models (Britz et al., 2012), the analysis of the entrepreneurial process must include different countries, national regions, agricultural subsectors, and more family-level variables (Gellynck et al., 2015; Pindado & Sánchez, 2017).

Even though the impact of social entrepreneurship initiatives at community and societal levels has tended to be overlooked by entrepreneurship and management scholars (Lumpkin et al., 2018), the agricultural sector provides interesting avenues of research. Attending to the prominence of agricultural entrepreneurship studies in rural areas, more studies are needed to address this issue in the urban environment, especially the potential of urban agriculture for social development and economic growth, based on the community's empowerment (Delgado, 2017).

In both periods, the development of non-agricultural businesses was highlighted by the researchers. Still, the resources of the agricultural sector provide other important

opportunities, namely the implementation of organic production (Anzaku & Salau, 2017). In the last years, as this label has been associated with sustainable business models of urban agriculture and traditional production in rural areas (D'Oronzio & Pascarelli, 2016; Dimitri et al., 2016), it is important to know the motivations and factors that may influence the decision-making process of introduction of food quality labels besides organic production. In this sense, more quantitative studies must analyse the introduction of other environmental certification schemes as GlobalGAP (Ras & Vermeulen, 2009) and their effects on the income of farms, to implement the most adequate entrepreneurial strategy. To understand how new value is created in on-farm diversification, resources need to be analysed in conjunction with the capability to appropriate the value generated from creativity and unique resources at the farm (Grande, 2011).

## **Chapter 3 - Entrepreneurial entry on the agricultural sector: what is the role of new entrants and farm successors?**

### **3.1. Introduction**

Even though succession is the most common mean of entry into farming in Europe (Bertolozzi-Caredio et al., 2020; Góngora et al., 2019; Zagata & Sutherland, 2015), there is a growing number of new entrants who bring with them several resources gained outside agriculture, including social, human and financial capital (EIP-AGRI, 2016). Entrepreneurs can enter the agricultural sector through various ways, ranging from complete newcomers to the industry to individuals or families returning to a family-held farm later in life (Pindado et al., 2018), which may be associated with different types of capital.

The perspective of farm successor as an individual that inheritance a farm is well accepted. At the same time, the various definitions of new entrants make it impossible to assess their number in Europe accurately. The Eurostat database allows only to identify the number of young farmers as sole holders under 35 years, excluding new entrants of other age categories (EIP-AGRI, 2016). There are also some studies based on secondary data from Global Entrepreneurship Monitor (GEM), that provide an indicator of new agricultural entrances in Europe (Dias & Rodrigues, 2019; Pindado & Sánchez, 2017, 2018; Pindado et al., 2018). GEM provides data about the percentage of the population between 18–64 years old that is involved in starting a new venture or is the owner/manager of a business that is less than 42 months old (Reynolds et al., 2005). However, it only comprises a limited number of variables on the characteristics of early-stage agricultural entrepreneurs (Pindado et al., 2018), besides many of the agricultural businesses take a more extended starting-up period than in other industries, namely because some fruit trees only begin to produce after 42 months upon planting. Thus, we follow the definition from the United States Department of Agriculture (USDA), which view new entrants as individuals or groups who have operated a farm for ten years or less (Ahearn & Newton, 2009; EIP-AGRI, 2016), independently from being farm successors or not (Pindado & Sánchez, 2017).

Although they represent important sources of innovation and entrepreneurship within agriculture, there has been limited research about agricultural entrants in Europe (EIP-AGRI, 2016). Further research is needed on the assets of agricultural entrants beyond the official

statistics, including older entrants, since they may play an essential role in the sector (Zagata & Sutherland, 2015). Besides the period of start-up, the path that individuals have followed up to the start of the activity (successors or newcomers) should be examined, and their stocks of capital such as the kind of work experience and formal educational background (Pindado et al., 2018). Hence, our study aims to contribute to filling this gap, analysing the types of the capital of new entrants and farm successors.

Our work provides various contributions. In the first place, the literature about entrepreneurial entry processes has neglected the agricultural sector (Pindado & Sánchez, 2017). Hence, it will be interesting to examine two groups of farmers that reflect two perspectives of entry: new entrants, comprising those with fewer years in the sector, and farm-successors, focusing on inheritance as a form of entry.

Our study explains the agricultural entry process, through the association between farm capital and age. Although the literature about general entrepreneurship has examined different types of capital (Lumpkin et al., 2018), their measurement has particularities in the agricultural sector. In the case of physical capital, land characteristics must be analysed since agriculture is dependent of land as a production factor (Britz et al., 2012), which can limit farm growth (Stenholm & Hytti, 2014). Concerning financial capital, Common Agricultural Policy (CAP) measures should also be investigated, especially the business start-up scheme directed to younger farmers (Balezentis et al., 2020; Zagata & Sutherland, 2015). As entrepreneurship databases including specific agricultural variables are unavailable (Pindado & Sánchez, 2017), our study collects primary data to analyze the effect of farm capital on new entrances and farm succession, considering the mediating effect of human capital and age.

Our research extends the application of the human capital theory to the entry into the agricultural sector. Contrarily to the association between human capital and performance, the influence of human capital on forms of entrepreneurial entry has been neglected by researchers (Estrin et al., 2016). Hence, this study shows how differences in human capital influence distinct options in entrepreneurship, namely between new and established entrepreneurs as well as between farm successors and newcomers. Moreover, the analysis of a sector often associated with a lower level of human capital (Pindado & Sánchez, 2017) may bring new insights to the entrepreneurship literature.

The study is conducted in an unexplored context. Attending at the considerable heterogeneity of agricultural units at the regional level (Britz et al., 2012), a questionnaire was administered by personal interviews with 160 farmers, in an inland region of Portugal. Although this country

presents the highest share of farmers older than 55 years in Europe (Giannakis & Bruggeman, 2015), it seems to have also a high rate of entrants (Pindado et al., 2018), which requires a deeper understanding of those dynamics. New entrants are not necessarily young nor oriented towards traditional farm business development (Zagata & Sutherland, 2015).

## **3.2. Literature review**

### **3.2.1. Entrepreneurial entry process on the agricultural sector**

The entrepreneurial entry process on agriculture remains unclear (Pindado et al., 2018), and the literature has focused on specific categories of agricultural entrants, such as farm successors. The existence of a successor is crucial to enhance farm growth strategies and the adaptation to external changes. In contrast, the absence of a potential successor often leads to farm disinvestment and abandonment (Suess-Reyes & Fuetsch, 2016). Despite farm succession is the principal type of farm transfer in European agriculture, their decline in the last years arises as a major concern to the future of European agriculture. This reflects a poor generational renewal, designed as the young farmer problem, which is especially evident in small-scale farming in southern regions of Europe (Bertolozzi-Caredio et al., 2020; Zagata & Sutherland, 2015). Therefore, the influence of stocks of capital on farm succession requires a more comprehensive analysis (Pindado et al., 2018).

The decreasing number of young farmers and their heterogeneity had led several studies to analyse this group, independently from being farm successors or not (Calus, Huylenbroeck, & Lierde, 2008; Góngora et al., 2019; Joosse & Grubbstrom, 2017; Mckillop, Heanue, & Kinsella, 2018; Milone & Ventura, 2018; Zagata & Sutherland, 2015). Despite the lack of young farmers, different aspects were already identified as fundamental to encourage young people to enter into the agricultural sector: the Common Agricultural Policy (CAP) support to start-up, the recognition that the family farm is a profitable enterprise and a good professional alternative, the unemployment in countries more affected by the economic crisis (Góngora et al., 2019) or even the pursuit of livelihood and lifestyle goals (Mckillop et al., 2018). However, not all young farmers are new entrants to agriculture; besides, new entrants may have any age (Zagata & Sutherland, 2015).

Back-to-the-land farmers, that may include younger people, are another category of agricultural entrants analysed in the literature. They constitute a diverse group motivated mainly by dissatisfaction with urban work and consumption patterns, as well as opportunities for more experimental and autonomous ways of living (Wilbur, 2014a), although not necessarily denote lack of commercial orientation (Sutherland, Barlagne, & Barnes, 2019).

Most back-to-the-land farmers are not likely to engage in capital-intensive farming due to lifestyle preferences, political/ethical positions and economic factors, but rather are more attracted to labour-intensive and quality-focused farming, such as organic farming (Wilbur, 2014b).

Some of the back-to-the-land farmers are analysed as lifestyle farmers, who conceive their occupancy of land primarily in terms of “a place to live” rather than a production site with financial goals (Bohnet, Potter, & Simmons, 2003). Other authors develop other terms besides lifestyle farmers. One is “hobby farmers”, that run small farms for recreational purposes (Sutherland, 2018). Another is “new country gentlemen”, constituting medium to large-scale agricultural land managers producing agricultural goods without the intention of obtaining profit from it, but facing land ownership as a source of prestige and wealth (Sutherland, 2012).

Independently from the category, the agricultural sector seems to attract a great heterogeneity of entrants to agriculture (Barbieri & Mahoney, 2009).

### **3.2.2. Human capital theory**

According to the human capital theory, individuals’ knowledge and skills improve their cognitive abilities to attain higher performance outcomes like professional success and income (Becker, 1964), since it leads to a wide knowledge base allowing individuals to adapt to new situations (Estrin et al., 2016). This theory has been applied in different subject areas and different levels of analysis, being recognized as an important source of the firm’s competitive advantage (Xiao, Dowejko, Au, & Hsu, 2019).

The assumption that individuals with stronger levels of human capital will accomplish better performance outcomes than those with lower levels has received extensive support in the entrepreneurship field (B. C. Martin, McNally, & Kay, 2013; Ployhart & Moliterno, 2011; Xiao et al., 2019), since human capital improves individuals’ ability to successfully pursue and exploit entrepreneurial opportunities (B. Lee, 2018). Nevertheless, it is crucial a more dynamic analysis of human capital in the entrepreneurship field, focusing on the entrepreneurial outcomes of educational activities (B. C. Martin et al., 2013) as the forms of entrepreneurial entry (Estrin et al., 2016).

Common measures of human capital are entrepreneurial experience and education. Although education has a negative effect on the decision to become an entrepreneur in agriculture (Pindado & Sánchez, 2017), farmers are increasing their qualification, especially new entrants (Zagata et al., 2017). Moreover, attending that the agricultural sector works as a support network in times of economic difficulty in Europe (European Commission, 2013), it seems that

many entrepreneurs in the last years prefer to start an agricultural business, in detriment of other sectors that were traditionally more profitable before the financial crisis of 2008 (Dias & Rodrigues, 2019). Therefore, we suggest that the form of entrepreneurial entry to the agricultural sector is influenced by different levels of human capital, attending to two aspects: the number of years on the sector (dichotomy new/established entrepreneurs) and farm inheritance (dichotomy farm successors/newcomers).

### **3.3. Research hypotheses**

Wealth creation is often linked to entrepreneurship, reflecting stocks of capital like assets, resources and human capabilities (Lumpkin et al., 2018). Our study examines four types of capital: financial, physical, social and human capital (Enderle, 2009; Lumpkin et al., 2018). Conjointly with age, it is analysed their influence on new entrances and farm succession.

#### **3.3.1. Financial capital**

Financial capital is essential to the establishment of a new venture (Knatko, Shirokova, & Bogatyreva, 2016). It reflects not only cash resources like savings, remittances, credit and pensions of the entrepreneur but also stocks, receivables, bonds, promissory notes, and other assets that may be transformed in cash (Díaz-Montenegro, Varela, & María, 2018; Lumpkin et al., 2018). In the agricultural sector, Common Agricultural Policy (CAP) funding to start-up (Sánchez-Zamora, Gallardo-Cobos, & Ceña-Delgado, 2014) and off-farm employment (Barnes et al., 2015) were already identified as important types of financial capital.

Despite the increasing level of public measures to enhance the creation of new businesses across different sectors, not all the measures have the same influence (Fuentelsaz, González, & Maicas, 2019). The CAP support to start-up, direct to young farmers, has been essential to attract new entrants and farm successors (Sánchez-Zamora et al., 2014). CAP defines them as farmers under 40 years of age with adequate occupational skills that set up on an agricultural holding for the first time, and the farmer is established as the head of the holding (Zagata & Sutherland, 2015). In the case of Portugal, this programme was experienced an enormous uptake including who were unemployed and/or seeking to complement their household incomes (Sutherland et al., 2017), particularly after the financial crisis of 2008 (Delgado, 2017; Dimian, Aceleanu, Ileanu, & Şerban, 2018; González-Pernía et al., 2018). This interest may suggest that those young farmers are less prepared. However, the training requirements and the complexity of the applications for young farmer supports were attracted younger people who are more entrepreneurial and able to develop a solid business plan (Zagata et al., 2017).

Cash resources of farmers may comprise off-farm employment (Barnes et al., 2015), which allow to increase household income (Rønning & Kolvereid, 2006) and to attend the farm financial needs. Off-farm employment was found to be essential to undertake either commercial and non-commercial farming, including in the case of farm successors (Sutherland, 2012, 2018) and small farms (Shucksmith & Rønningen, 2011).

***Hypothesis 1:*** *Financial capital (CAP funding to start-up, Off-farm employment) is associated with a) the likelihood to be a new entrant; b) the likelihood to be a farm successor.*

### **3.3.2. Physical capital**

Physical capital comprises land and its natural resources, buildings, machinery and equipment (Lumpkin et al., 2018). In the agricultural sector, it may include the utilised agricultural area and its ownership (Díaz-Montenegro et al., 2018; Jezeer, Verweij, Boot, Junginger, & Santos, 2019).

Farm succession is the most common form of intergenerational renewal (EIP-AGRI, 2016; Pindado & Sánchez, 2017), although some of the potential successors decide to abandon the agricultural activity, especially in farms with limited physical dimension (Bertoni & Cavicchioli, 2016) such as land. New entrants compete for land with existing farmers, who are attempting to achieve economies of scale (Zagata & Sutherland, 2015), but the higher cost of land is generally considered the main barrier to new entrants (EIP-AGRI, 2016; Zagata et al., 2017). Due to legislation and tradition of inheritance, farmland is not easily traded in many countries, and so farming is viewed here as a “closed profession” (Breckenridge & Taplin, 2005; Grande et al., 2011; Zagata & Sutherland, 2015).

The European agricultural sector is characterised by small-family farms (Eurostat, 2017), mainly in Mediterranean countries (Zagata & Sutherland, 2015) like Portugal. However, Mediterranean agriculture is a compelling case of small scale low-intensity units. Farms in areas of high nature value and with cultural aspects linked to the preservation of traditions and customs have been crucial in the construction of high-quality food products (Moragues-Faus, 2014) directed to niche markets (Gellynck et al., 2012). Hence, tenancies and small-scale farms have traditionally represented a means of entering the farming sector (Sutherland et al., 2019), offering opportunities for new entrants engaging in innovative farm businesses (Sutherland et al., 2017), as organic farming or short food supply chains (EIP-AGRI, 2016; Zagata et al., 2017).

***Hypothesis 2:*** *Physical capital (utilised agricultural area, own land) is associated with a) the likelihood to be a new entrant; b) the likelihood to be a farm successor.*

### **3.3.3. Social capital**

In the last decades, many rural areas in Europe had seen its population fall considerably, due to a movement to urban centres of population searching for better living conditions. However, the economic crisis of 2008 has enhanced an inverse movement from cities to rural areas of people who are the owners of inherited family property, especially in South countries (Anthopoulou et al., 2017). At the same time, the number of lifestyle farmers that purchase farms to live there has increased in the last years in European countries (Bohnet et al., 2003). In all cases, local cooperation is based mostly on friendship or long-lasting contacts, taking the form of symbolic activities linked to expressions of local identity and solidarity (Phillipson, Gorton, & Laschewski, 2006).

Social capital may be measured by producer organisations membership (Díaz-Montenegro et al., 2018; Felzensztein, Gimmon, & Carter, 2010). New entrants and newcomers have a greater tendency to become involved in alternative activities with added value, particularly in local schemes of certification and alternative food-producing networks (EIP-AGRI, 2016), which generally implies producer organisation membership (Hajdukiewicz, 2014). Even though the agricultural sector in Portugal is not organised like in other European countries, there are already important producer organisations in some sectors such as fruits that allows trading their products in better conditions (Brusselsaers et al., 2014).

***Hypothesis 3:*** *Social capital (producer organisations membership) is associated with a) the likelihood to be a new entrant; b) the likelihood to be a farm successor.*

### **3.3.4. The mediating role of human capital**

Human capital may be analysed through higher education and previous entrepreneurial experience (Pindado & Sánchez, 2017). The perception of opportunity in a given context is subjective to each entrepreneur since different actors possess different prior knowledge and experience (Methorst, Roep, Verhees, & Verstegen, 2017; S. Shane, 2000). Although some new entrants or newcomers have difficulties in obtaining market and technical knowledge as well practical skills (Mailfert, 2007), entrants with previous business ownership experience have more diverse experiences and resources than novel entrepreneurs and, therefore, have more exceptional ability to identify business opportunities (EIP-AGRI, 2016; Pindado et al., 2018). Furthermore, this experience may provide basic business skills and confidence that can help to compensate for the liabilities of newness and may therefore facilitate new market entry (Hessels, Grilo, Thurik, & van der Zwan, 2011). In this sense, a substantial proportion of business founders had previous experience of business ownership (Alsos & Carter, 2006).

Education positively influences entrepreneurial behaviour in the agricultural sector (Dias, Rodrigues, & Ferreira, 2019b). However, education has a negative effect on the decision to become an entrepreneur in the agricultural sector compared to other sectors (Pindado & Sánchez, 2017). In Portugal, 71.4 percent of farm managers have only a basic level of education, and 5.8 percent have higher education (INE, 2018). Few farmers have higher education in the agricultural field (2.5 percent) but this weight increases in EU (8.5 percent) (Eurostat, 2017). Nevertheless, we are seeing an increasing qualification and professionalisation of farmers in countries like Portugal, especially new entrants (Zagata et al., 2017). A well-succeed new generation of innovative farmers is emerging particularly in Southern countries, generally running small farms, which show a high sense of responsibility and solidarity toward their social groups and communities since they are aware that farming can have great ecological and social consequences (Milone & Ventura, 2018). Even though some of the entrants lacked the financial and technical means to start up new agricultural ventures, there are successful and innovative examples especially the higher-educated ones (Anthopoulou et al., 2017; Kasimis & Papadopoulos, 2013).

***Hypotheses 4:*** *Human capital (higher education, previous entrepreneurial experience) has a mediating effect on a) the likelihood to be a new entrant; b) the likelihood to be a farm successor.*

### **3.3.5. The mediating role of age**

Younger people are more likely to become entrepreneurs (Arenius & Minniti, 2005). Still, there is an evident lack of young farmers in Europe (Zagata & Sutherland, 2015), where only 5.9 percent are less than 35 years in 2013 (Eurostat, 2017). This tendency is even more pronounced in Mediterranean countries where farm managers aged 65 or above are more represented, especially in Portugal (50.1 percent) (Eurostat, 2017). This fact may be a reflex of the high numbers of small-scale farms managed by older farmers in those countries (Zagata & Sutherland, 2015) and also because farm succession often occurs later in life. Despite the existence of a successor is vital to the successful adjustment of the farm to changing conditions within EU agriculture (Zagata & Sutherland, 2015), there are cases where farm successors return to a family-held farm later in life (Pindado et al., 2018). Besides financial rewards (Perenyi et al., 2018), many retirees are seeking the rural experience or willing to capitalise on a hobby, which brings societal benefits such as maintaining rural landscapes, preserving agricultural heritage and natural resources conservation (Barbieri & Mahoney, 2009).

Above all, young people are essential to renew the agricultural sector: they are more productive and achieve higher profitability, showing greater aptitude to innovate, to intercept funding

opportunities, to adopt a new technological framework and to engage in Agri-environmental schemes (Giannakis & Bruggeman, 2015; Sutherland et al., 2016).

**Hypotheses 5:** *Age has a mediating effect on a) the likelihood to be a new entrant; b) the likelihood to be a farm successor.*

The research model analyses the influence of financial, physical and social capital on new entrances and farm succession, as well the mediating role of human capital and age (Figure 3.1). Gender and number of household members were used as control variables, attending to the important roles of women (EIP-AGRI, 2016) and family (Pindado & Sánchez, 2017), on the decision of entry into the agricultural sector.

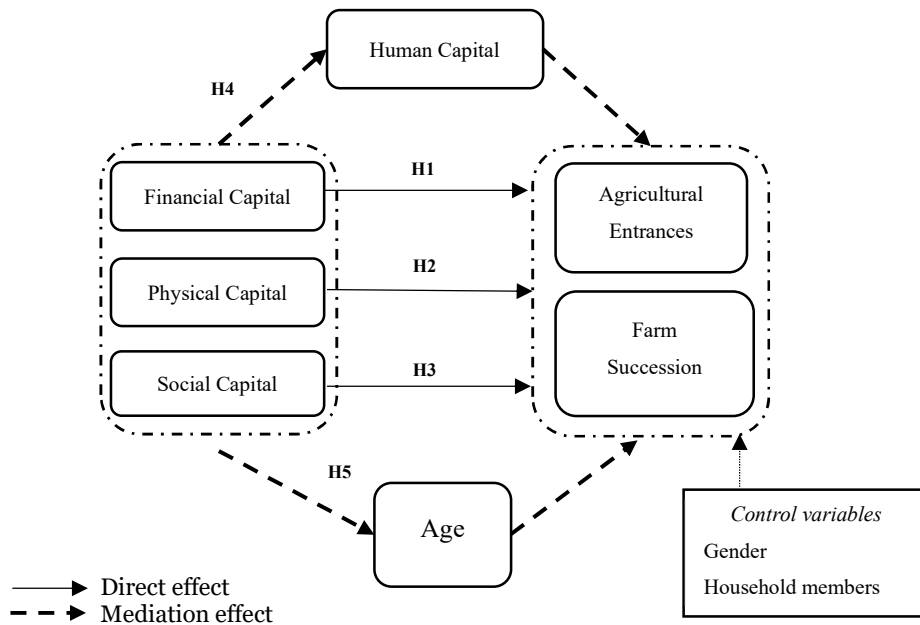


Figure 3.1 - Research model

### 3.4. Methods

#### 3.4.1. Sample characteristics

We analyse the entrepreneurial behaviour of new entrants and farm successors. Attending that Eurostat data excludes agricultural entrants older than 35 years (EIP-AGRI, 2016; Pindado et al., 2018), we follow the definition of new entrants from the United States Department of Agriculture (USDA) that includes individuals or groups who have operated a farm for ten years

or less (EIP-AGRI, 2016). However, contrarily to the USDA perspective, we do not include individuals and households who use their farm solely for residential purposes.

Similarly to previous studies about new entrants (Góngora et al., 2019) and farm successors (Bertolozzi-Caredio et al., 2020), our study is conducted at a regional level in a specific agricultural sector: the sector of the fresh fruit. The number of farmers interviewed was 160, of which 74 were agricultural entrants and 97 farm successors. The characteristics of the sample (total and agricultural entrants) are reported in Table 3.1.

Table 3.1 - Sample characteristics

Variable	Category	Total		
		N=160		
		Nº	%	
New entrants	Yes	74	46.3	
	No	86	53.7	
Farm successors	Yes	97	60.6	
	No	63	39.4	
Gender	Male	114	71.3	
	Female	46	28.7	
Household members (number)	1	12	7.5	
	2	61	38.1	
	3	37	23.1	
	4	42	26.3	
	5	8	5	
CAP funding to start-up	Yes	80	50	
	No	80	50	
Off-farm employment	Yes	47	29.4	
	No	113	70.6	
UAA	1 to 5 ha	38	23.7	
	5 to 20 ha	66	41.3	
	20 ha or more	56	35	
Own land	Yes	134	83.7	
	No	26	16.3	
Membership of Producer organisation	Yes	40	25	
	No	120	75	
Previous Entrepreneurial experience	Yes	45	28.1	
	No	115	71.9	
Higher Education background	None	121	75.6	
	Social sciences,	Business sciences	12	7.5
	Trade and law	Other social sciences and	6	3.8
	Law			
	Agriculture		10	6.3
	Engineering, transformative industries and construction		7	4.4
	Education		2	1.3
	Health and Social Protection		1	0.6
	Sciences, maths and informatics		1	0.6
	Arts and Humanities		0	0
Age (years old)	Less than 35	18	11.3	
	35 to 44	29	18.1	
	45 to 54	35	21.9	
	55 to 64	40	25	
	65 or more	38	23.7	

Note: CAP- Common Agricultural Policy; UAA - Utilised Agricultural Area

### 3.4.2. Analytical approach

To investigate the likelihood to be a new entrant and a farm successor, we perform two binary hierarchical logistic regressions, where we estimated the effects caused by each model on the likelihood that the dependent variable will take the value of 1 as opposed to a value of 0 (Table 3.2). In the first binary logistic regression, the dependent variable assumes the value of 1 for “new entrant” and 0 for “established farmer”. In contrast, in the second regression, this variable takes the value of 1 for “farm successor” and 0 for “newcomer”. The independent variables are the same in the two regressions.

We analysed five models. Model 1 is composed of the control variables. Model 2 also includes the direct effects of financial, physical and social capital. Model 3 adds the mediating effect of human capital, while Model 4 reflects the mediating effect of age. Finally, Model 5 is the global model with all variables.

Table 3.2 - Variables and description

Variable	Description
<i>Dependent variables</i>	
New entrants	If the respondent is a new entrant (0-No; 1-Yes)
Farm successors	If the respondent is a farm successor (0-No; 1-Yes)
<i>Independent variables</i>	
Financial capital	
CAP funding to start-up	If the respondent had benefited from CAP funding to start-up (0-No; 1-Yes)
Off-farm employment	If the respondent has off-farm employment (0-No; 1-Yes)
Physical capital	
UAA	Class of hectares (1-1 to 5 ha; 2-5 to 20 ha; 3-20 ha or more)
Own land	If the respondent owns the land (0-No; 1-Yes)
Social capital	
Producer organisation	If the respondent is a member of a producer organisation (0-No; 1-Yes)
Human Capital	
Higher Education	If the respondent has higher education (0-No; 1-Yes)
Previous entrepreneurial experience	If the respondent has previous entrepreneurial experience (0-No; 1-Yes)
Age	Age in years
<i>Control variables</i>	
Gender	Gender (0-male; 1-female)
Household members	Number of household members

Note: CAP- Common Agricultural Policy; UAA - Utilised Agricultural Area

CAP funding to start-up (Sánchez-Zamora et al., 2014), off-farm employment (Barnes et al., 2015), own land (Carter, 2001; Sutherland et al., 2019), producer organisations membership (Jezeer et al., 2019), higher education (Díaz-Montenegro et al., 2018) and previous entrepreneurial experience (Pindado et al., 2018) are binary variables that take the value of 1 for Yes and 0 for No. UAA (Utilised Agricultural Area) is a categorical variable that comprises the following categories: 1 to 5 ha, 5 to 20 ha, 20 ha or more (Carter, 2001; Sutherland et al., 2019). Age is measured by the number of years old (Pindado & Sánchez, 2017). The two control

variables comprise gender and household members. Gender is measured by male (“0”) or female (“1”), and household members are measured by their number.

SPSS software (version 26) was used to perform all the analyses.

### **3.5. Results**

Table 3.3 shows the descriptive statistics and correlation matrix. Multicollinearity was not a problem: none of the Variance inflation factors (VIF) scores approached the threshold of 10, presenting values below 3 (Hair et al., 2006).

#### **3.5.1. New entrants**

The results of the logistic regression for new entrants are presented in Table 3.4. The values of  $R^2$  of Nagelkerke (1991) increased between model 1 (.058) and model 5 (.650). This increase indicates that the last model explains a high percentage of the likelihood of being a new entrant.

We conclude that hypotheses H4a and H5a are supported while hypotheses H1a and H2a are partially supported, and we found no support for hypothesis H3a, which refers to social capital. Model 1 indicates that control variables (gender and household members) do not have a significant effect. The results from Model 2 partially support hypothesis H1a for financial capital. Common Agricultural Policy (CAP) funding to start-up and off-farm-employment have both a positive impact, but only the effect of off-farm-employment (OR=2.791;  $p<.05$ ) is significant. Model 2 also partially supports H2a for physical capital, with UAA-5 to 20 ha (OR=2.564;  $p<.05$ ) presenting a positive association. In this model, farmers off-farm employed with UAA-5 to 20 ha tend to be a new entrant.

Model 3 shows that H4a is supported since human capital has a mediating effect on the likelihood to be a new entrant through financial capital. After adding this effect, off-farm employment has a non-significant influence. However, the direct impact of human capital is also non-significant. In the same way, Model 4 reflects the mediating effect of age on the likelihood to be a new entrant through financial and physical capital, confirming H5a. With this mediating effect, off-farm employment has a non-significant association, while CAP funding to start-up has now a significant and negative impact (OR=.213;  $p<.05$ ) and UAA-1 to 5 ha (OR=7.065;  $p<.05$ ) presents a positive influence. Age also has a negative and significant effect (OR=.779;  $p<.001$ ), which means that younger people tend to be new entrants. In this model, as the control variable “household members” has a negative impact (OR=.539;  $p<.05$ ), farmers in smaller households are likely to enter into the agricultural sector. In Models 3 and 4, UAA-5 to 20 ha continue to have a positive and significant impact.

Table 3.3 - Descriptive statistics and correlation matrix

	<b>Mean</b>	<b>S. D.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
1. Agricultural entrances	.46	.50													
2. Farm succession	.61	.49	.06												
3. Female	.29	.45	.13	.12											
4. N° household members	2.83	1.06	.16*	-.08	-.03										
5. CAP funding to start-up	.50	.50	.18*	.04	0	.54**									
6. Off-farm employment	.29	.46	.20*	-.10	-.11	.23**	.07								
7. UAA 1 to 5 ha	.24	.43	-.08	.09	.10	-.23**	-.47**	-.04							
8. UAA 5 to 20 ha	.41	.49	.17*	.03	.06	-.06	.05	.02	-.47**						
9. UAA 20 ha or more	.35	.48	-.10	-.11	-.15	.27**	.37**	.02	-.41**	-.62**					
10. Own land	.84	.37	-.14	.23**	.06	-.18*	-.24**	.02	.17*	.06	-.21**				
11. Producer organization	.25	.43	-.04	-.16	-.05	.09	.09	.10	-.29**	.02	.24**	-.18*			
12. Higher education	.24	.43	.17*	.01	.03	.24**	.13	.50**	-.25**	.03	.19*	-.11	.28**		
13. Previous Entrepreneurial experience	.28	.45	.09	-.44**	-.24**	.03	-.07	.27**	-.09	-.02	.10	.01	-.01	.13	
14. Age	53.42	13.79	-.59**	-.06	-.01	-.57**	-.61**	-.33**	.40**	-.12	-.24**	.34**	-.04	-.32**	.03

\* $p < 0.05$

\*\* $p < 0.01$

Note: CAP- Common Agricultural Policy; UAA - Utilised Agricultural Area

Table 3.4 - Results of logistic regression for new entrants

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
<i>Control variables</i>										
Female	1.857	.359	2.030	.392	2.108		1.856	.512	2.535	.550
N° household members	1.379*	.155	1.129	.195	1.096		.539*	.301	.471*	.331
<i>Direct effects</i>										
CAP funding to start-up			1.883	.461	2.138	.475	.213*	.702	.200*	.747
Off-farm employment			2.791*	.402	1.962	.461	.564	.592	.376	.644
UAA 1 to 5 ha			1.674	.579	2.182	.605	7.065*	.811	10.165**	.875
UAA 5 to 20 ha			2.564*	.425	2.880*	.438	3.644*	.601	3.841*	.626
UAA 20 ha or more							*		*	
Own land			.413	.487	.419	.494	1.377	.712	1.630	.764
Producer organisation			.647	.434	.627	.453	1.215	.626	1.390	.642
<i>Mediating effect</i>										
Higher education					1.711	.501			1.008	.653
Previous entrepreneurial experience					1.674	.417			4.429*	.582
Age							.779***	.042	.761***	.047
Constant	.288	.489	.371	.791	.281	.824	1741459.523***	2.807	4357254.706***	3.080
Log-likelihood	213.762		196.845		194.184		121.396		114.262	
R <sup>2</sup> (Nagelkerke)	.058		.187		.205		.619		.650	
Chi <sup>2</sup>	15.163		2.542		9.002		3.912		6.588	
Global % of predictions	56.9		66.9		66.3		81.3		83.8	

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

Note: CAP- Common Agricultural Policy; UAA - Utilised Agricultural Area

Model 5 is the global model, including all variables. It suggests a mediating effect of age on the likelihood to be a new entrant through human capital. With this effect, previous entrepreneurial experience (OR=4.429;  $p<.05$ ) presents now a positive and significant influence, which means that farmers with previous entrepreneurial experience are 4.429 times as likely to be a new entrant. However, higher education continues not to present a significant impact. In the global model, younger farmers in smaller households but without CAP funding to start-up, having UAA-1 to 5 ha or UAA-5 to 20 ha, and previous entrepreneurial experience tend to be a new entrant.

### **3.5.2. Farm successors**

The results of the logistic regression for farm successors are exposed in Table 3.5. In comparison with model 1 (0.027), the value of  $R^2$  of Nagelkerke (1991) in model 5 (0.399) had increased, reflecting a good percentage of the likelihood of being a farm successor.

The results provide support to the hypotheses H4b and H5b and partial support to the hypotheses H1b and H2b, while the hypothesis H3b is not supported since social capital is not associated with farm succession. Model 1 shows that the control variables (female gender and household members) not have a significant relationship with the likelihood to be a farm successor. In Model 2, after including the independent variables, we found partial support to H1b and H2b, which refers that financial and physical capital are associated with farm succession. In particular, CAP funding to start-up (OR=2.536;  $p<.05$ ) and own land (OR=3.741;  $p<.01$ ) have a significant positive impact. In this model, farmers with their land and that had access to CAP funding to start-up are likely to be a farm successor.

Models 3 and 4 demonstrate the mediating effect of human capital and age on farm succession through financial capital since the impact of CAP funding to start-up is now non-significant. Hence, H4b and H5b are supported. Relatively to the direct effect of human capital, we found that higher education (OR=3.795;  $p<.05$ ) and previous entrepreneurial experience (OR=.094;  $p<.001$ ) present a positive and negative impact, respectively. In the same way, age (OR=.945;  $p<.01$ ) has a significant negative impact on farm succession. In both models, the effect of physical capital, measured by owned land, is still significant.

In the global model (Model 5), comprising all variables, own land continues to have a significant and positive influence on farm succession (OR=9.152;  $p<.001$ ). The direct effects of higher education, previous entrepreneurial experience and age also continue to be significant. Thus, we can state that younger and higher educated farmers with owned land but without previous entrepreneurial experience tend to be a farm successor.

Table 3.5 - Results of logistic regression for farm successors

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
<i>Control variables</i>										
Female	1.712	.373	1.471	.396	.852	.448	1.345	.406	.815	.452
N° household members	.859	.155	.818	.202	.757	.226	.675	.218	.665	.236
<i>Direct effects</i>										
CAP funding to start-up			2.536*	.469	2.385	.538	1.556	.585	1.556	.571
Off-farm employment			.696	.388	.707	.536	.421	.176	.468	.589
UAA 1 to 5 ha			1.823	.558	1.693	.661	2.421	.773	2.105	.680
UAA 5 to 20 ha			1.250	.413	1.181	.471	1.161	.504	1.125	.487
UAA 20 ha or more										
Own land			3.741**	.487	5.645**	.563	6.521***	2.175	9.152***	.641
Producer organisation			.667	.415	.403	.476	.829	.355	.475	.492
<i>Mediating effect</i>										
Higher education					3.795*	.632			3.577*	.649
Previous entrepreneurial experience					.094***	.477			.098***	.489
Age							.945**	.021	.953*	.023
Constant	2.051	.485	.511	.775	.954	.886	16.578	1.527	16.481	1.646
Log-likelihood	211.353		196.660		163.263		188.852		158.701	
R <sup>2</sup> (Nagelkerke)	.027		.143		.371		.201		.399	
Chi <sup>2</sup>	8.798		2.587		4.547		12.421		7.027	
Global % of predictions	61.9		66.9		78.8		73.1		79.4	

\*p < 0.05

\*\*p < 0.01

\*\*\*p < 0.001

Note: CAP- Common Agricultural Policy; UAA - Utilised Agricultural Area

### **3.6. Discussion**

The results show that the access to land and financial capital influence entrepreneurial entry (Balezentis et al., 2020; EIP-AGRI, 2016; Góngora et al., 2019), but there are differences between new entrants and farm successors. Farmers off-farm employed with UAA-5 to 20 ha are likely to be a new entrant, while farmers with their land and benefiting from CAP funding to start-up tend to be a farm successor. This conclusion may mean that, at an early stage of their entrepreneurial activity, new entrants with off-farm employment search for a complementary source of income provided by agriculture through farms with 5 to 20 ha (Sutherland et al., 2019). Attending that farm successors have already their land, it is easier to begin an agricultural business benefiting from the CAP funding to start-up since this support has some requirements related to the minimum size of a farm (Zagata & Sutherland, 2015).

Human capital mediates the relationships between off-farm employment and new entrants as well as between CAP funding to start-up and farm successors, making non-significant the effect of financial capital. The direct impact of human capital is non-significant on new entrances but significant on farm succession since higher education and previous entrepreneurial experience have a positive and negative effect on succession, respectively. The importance of higher education for farm succession is especially important because education is a determinant of entrepreneurial quality (Guzmán & Santos, 2001) and higher-educated people tend to obtain more financial success (Anthopoulou et al., 2017; Kasimis & Papadopoulos, 2013).

Although younger people are less prone to be entrepreneurs in the European agricultural sector than in other sectors (Pindado & Sánchez, 2017; Zagata & Sutherland, 2015), our study found that this tendency has changed in the last years and younger people are likely to be a new entrant (Dias & Rodrigues, 2019; EIP-AGRI, 2016; Pindado & Sánchez, 2017) as well as a farm successor, namely in subsectors more attractive as the sector of the fresh fruit. Age has a mediating effect on farm succession through financial capital. Still, this mediating effect is broader on new entrances, affecting the effects of financial, physical as well as human capital.

Previous studies refer a low level of new entrants with previous entrepreneurial experience (Pindado & Sánchez, 2017; Pindado et al., 2018), an important component of human capital, but our study shows that younger farmers with entrepreneurial experience are more likely to be new entrants. In terms of physical capital, age turns significant and positive the impact of UAA-1 to 5 ha on new entrances. These results endorse that small farms are a common way of young farmers to enter into the agricultural sector (Milone & Ventura, 2018). Concerning financial capital, only CAP funding to start-up has a significant but negative influence, which

is a surprising conclusion from a certain point of view. This negative influence means that younger farmers that do not benefit from this support tend to be new entrants and not established farmers with more than ten years of experience as owner-manager. Although those results do not deny the important role of CAP support to start-up in attracting younger entrants (Sánchez-Zamora et al., 2014; Sutherland et al., 2017), they may reflect the changes operated in this support in the last years, that makes more difficult the access of younger farmers with small farms or small investments (Balezentis et al., 2020), which is the case of many farmers in Mediterranean countries as Portugal.

The results suggest that younger and higher educated farmers running their land but without previous entrepreneurial experience are likely to be a farm successor. While it is not surprising that farm successors have their land and no previous entrepreneurial experience, the same does not happen with higher education since previous studies have related it with newcomers to the agricultural sector (EIP-AGRI, 2016; Sutherland et al., 2017). This may be a new class of farm successors with more qualification and better prepared to face the demanding challenges that the sector faces. Furthermore, contrarily what is suggested in previous studies (EIP-AGRI, 2016; Zagata et al., 2017), there is a rejuvenation of farm successors while newcomers seem to be older. Those newcomers may invest in agriculture later in life (Barbieri & Mahoney, 2009; Perenyi et al., 2018), although their previous entrepreneurial experience may provide basic business skills and confidence that can help them to achieve success in new businesses (Hessels et al., 2011).

Our study found that social capital and gender are not associated with new entrants and farm successors. Previous studies also state that farmers generally have a lower level of social capital (Pindado & Sánchez, 2017), including their participation in Producers Organisations (Brusselaers et al., 2014). Contrary to other studies, the female gender is not associated with new entrants (EIP-AGRI, 2016; Zagata & Sutherland, 2015), which may be related with their important role in the creation of farm-related firms oriented to non-agricultural businesses as agritourism (Dias et al., 2019b). Nevertheless, smaller households are related to new entrances and not with farm successors. Although both groups of farmers are younger, new entrants probably not have children and therefore the number of household members is small.

Considering the human capital theory, our research emphasizes the importance of examining how distinct types of human capital influence different entry approaches (new versus established and successors versus newcomers). Hence, higher educated farmers without previous entrepreneurial experience tend to be farm successors, while farmers with this experience are likely to be a new entrant. Moreover, human capital mitigates the importance

of the financial sources used by younger farmers, namely the off-farm employment of new entrants and CAP support to the start-up of farm successors. Although a lower level of human capital has been associated with the agricultural sector (Dias et al., 2019b; Pindado & Sánchez, 2017), our study shows that the form of entrepreneurial entry must be addressed when this issue is examined (Estrin et al., 2016).

### **3.7. Conclusions**

Our study contributes to a better understanding of the entrepreneurial entry process in agriculture, through the analysis of the impacts of farm capital and age on different groups of entrants as new entrants and farm successors. Focusing on the sector of the fresh fruit in a central inland region of Portugal, we found that younger farmers with previous entrepreneurial experience, owning smaller farms, without benefiting from CAP funding to start-up are likely to be a new entrant. Besides their direct effect, age mediates the relations between agricultural entrances and financial, physical as well as human capital. Age is also an important aspect of succession since younger and higher educated farmers running their land but without previous entrepreneurial experience are likely to be a farm successor. These results suggest a substantial rejuvenation of the sector, which is especially crucial in Mediterranean countries as Portugal, with a high share of farmers older than 55 years and small-scale farming (Bertolozzi-Caredio et al., 2020; Giannakis & Bruggeman, 2015).

The form of entrepreneurial entry into the agricultural sector is influenced by different levels of human capital, as suggest the human capital theory. Higher educated farmers, from various subject fields and not only from agricultural sciences (Sutherland et al., 2017) without previous entrepreneurial experience tend to be a farm successor, which means that they identify the family farm business as a better professional alternative than other professional choices. According to the human capital theory, those who want to improve their future economic well-being must invest in education (Bayon, Vaillant, & Lafuente, 2015). Still, this investment may have compensation even in different areas from the initial educational background. On the other hand, farmers with previous entrepreneurial experience are likely to be a new entrant, suggesting that in the last years experienced entrepreneurs are increasing their interest for investing in agriculture, aiming to achieve high performance outcomes. Hence, our study respond to recent calls for taking a more dynamic entrepreneurial approach of human capital theory, examining the specific entrepreneurial outcomes of educational and training activities (B. C. Martin et al., 2013) like the forms of entrepreneurial entry (Estrin et al., 2016).

The results may support the design of future public policies that are more efficient in attracting more entrants into the agricultural sector, especially the younger ones and with stronger human capital.

### **3.8. Limitations and future research lines**

Our study has limitations. As we examined the sector of the fresh fruit in a particular region, the findings may be hard to generalise to other sectors or regions with different types of farm capital and age profiles. We conclude that new entrants tend to have previous entrepreneurial experience, which suggests a new investment profile of entrepreneurs that consider agriculture as a sector more interesting than other sectors (Dias & Rodrigues, 2019), mostly in regions with excellent natural conditions and hydro-agricultural systems as it happens with Beira Interior region. More studies must investigate which type of sector this entrepreneurial experience has acquired and if this sector is closely related or not with the agricultural sector. Further studies should also examine the low participation of farmers on Producer Organisations and what motivates them to become a member (Kontogeorgos, Sergaki, & Chatzitheodoridis, 2017). Those studies could consider the number of Producer Organisations in a particular region since, in some regions like the Beira Interior region, there is only one Producers Organization which may limit even more the establishment of social and professional networks (Mylonas, 2015).

As CAP support to start-up does not attract all young farmers, further studies should analyse this type of support (Balezentis et al., 2020; Bertolozzi-Caredio et al., 2020), namely the main barriers that small farmers face obtaining this support. These studies may help in the design of future public support measures to young farmers since younger people tend to be more engaged in ambitious entrepreneurship (Giotopoulos, Kontolaimou, & Tsakanikas, 2016).

Our work examined new entrants with ten years of experience or less. Longitudinal studies could examine if and how long new entrants, as well as farm successors, remain in the sector. The motives to exit the sector should also be examined, namely the increasing competition from larger farm businesses and the low income associated with some agricultural subsectors (Fitz-koch et al., 2018).

## **Chapter 4 - How entrepreneurs face the farm diversification dilemma: conventional or unconventional businesses?**

### **4.1. Introduction**

In the strategic management literature, diversification occurs when an existing firm enters into a new area of business, through acquisition or internal growth (Orlando, Renzi, Sancetta, & Cucari, 2017; Puranam & Vanneste, 2016) and is considered an entrepreneurial process since results of the identification and exploration of business opportunities (Deligianni, Voudouris, & Lioukas, 2015). However, the definition of farm diversification has particularities since it is usually defined as on-farm or farming-related activity, which provides goods or services based on existing farm resources, that were previously employed in conventional agriculture (Hansson et al., 2013; Vik & McElwee, 2011). Hence, farms would have to use their farm resources to generate income outside conventional farm production. Moreover, what is considered to be vertical integration (processing or on-farm retailing) in the strategic management literature is deemed to be diversification in the farm diversification literature, involving added value to the products and satisfying the needs of a particular type of customer (Hansson et al., 2013).

Researchers have shown a significant interest on-farm diversification, especially during the last two decades, focusing not only on their determinants but also on pluriactivity, reflecting the different types of incomes of the farm family like off-farm employment and other businesses (Barnes et al., 2015). Besides, the literature about agricultural entrepreneurship has been linked to the diversification to non-agricultural businesses, although generally covering only one non-agricultural business as agritourism, care farms, farm SPA and kindergarten farms (Dias et al., 2019b).

Farm diversification encompasses many and complex aspects that were still not wholly examined (Perks & Medway, 2012). The literature suggests that farm diversification cover new ventures outside conventional agriculture (Barbieri & Mahoney, 2009; Derosa, McElwee, & Smith, 2019; Ilbery, 1991; McElwee & Smith, 2012), although the definitions of unconventional ventures are ambiguous. Hence, it is needed to empirically define “conventional farming” to determine if a farm is diversified (Barnes et al., 2015) conventionally or unconventionally. This need assumes particular importance in the case of non-agricultural businesses developed by

farmers, since the literature usually considers unconventional those businesses, although not all of them are (Hansson et al., 2013).

On the other hand, diversification is linked to portfolio entrepreneurship, whereby a person or group engages in multiple business ownership (Haugen & Jostein, 2008). Still, farm portfolio entrepreneurs must be analysed differently from other sectors as their various businesses are not necessarily different legal entities (Vik & McElwee, 2011). Furthermore, some authors defend that the entire household should be included in the analysis of entrepreneurial processes (Carter, 1999; Rønning & Kolvereid, 2006) since the role of other household members, besides the farmer, is crucial to the creation of farm-related firms (Lans et al., 2017).

Farm diversification has always accompanied European farms in recent decades (Giaccio et al., 2018; Kristensen et al., 2019). However, the literature highlight North Europe countries as the United Kingdom (Carter, 1998a, 1998b, 1999, 2001; Clark, 2009; Morris et al., 2017; Smith et al., 2017; Walford, 2003; Yoshida, Yagi, & Garrod, 2019), Finland (Niska et al., 2012; Pyysiäinen et al., 2006; H. T. Vesala & Vesala, 2010; K. M. Vesala & Peura, 2005; K. M. Vesala et al., 2007), Norway (Rønning & Kolvereid, 2006; Veidal & Flaten, 2014b; Vik & McElwee, 2011), Sweden (Ferguson & Hansson, 2015; Hansson et al., 2013) and Denmark (Kristensen et al., 2019). Furthermore, researchers focus on farms operating in different agricultural subsectors as crop and livestock sectors, without attending to their specificities. The analysis of other countries and specific subsectors may bring new insides to farm diversification literature.

Considering the complexity of farm businesses, with many of them not corresponding to different legal entities and others owned by household members, our study attempts to discriminate different profiles of farm diversification businesses and compare the respective farm, owner-manager and household characteristics. Attending at the lack of a clear operationalization of the concept of farm diversification, with the employment of different typologies and few consensuses on a single categorisation scheme (Barbieri & Mahoney, 2009; Ferguson & Hansson, 2015), our study makes an original contribution since it proposes an original framework that operationalises this concept in conventional and unconventional terms.

Despite the role of family business founders is emphasised in portfolio entrepreneurship, the creation of additional businesses by all members of the household should be examined (A. D. Cruz et al., 2012; Estrada-Robles et al., 2020). Hence, our study contributes to a better understanding of how portfolio entrepreneurship is developed in the family farm context,

analysing the type of farm-related firms created by all household members as well as the type of family ties. Furthermore, our work responds to recent calls for more quantitative studies about farm diversification (García-Cornejo, Pérez-Méndez, Roibás, & Wall, 2020) and family portfolio entrepreneurship (Estrada-Robles et al., 2020) in unexplored contexts, conducting a survey in the fresh fruit subsector in the Portuguese region of Beira Interior.

## **4.2. Literature review**

### **4.2.1. Farm diversification**

The notion of farm diversification had evolved along the time. In the early literature, any venture that provided additional income and could balance the risks was considered diversification. However, in recent years, research limits the concept of diversification to gainful activities outside conventional agriculture (Hansson, Ferguson, & Olofsson, 2010). Hence, some studies (Barnes et al., 2015; Hansson et al., 2010) propose the analysis of two types of diversification: i) the use of farm resources to produce income from activities outside conventional agriculture, and other more conventional ii) the income from two or more agricultural businesses, such as grain and milk.

The employment of different definitions of farm diversification has promoted different typologies (Steffen Korsgaard, Ferguson, & Gaddefors, 2015), which are strictly related to the country or region analysed. It may be focused on whether the activity takes place on-farm (activity as part of the existing farm-based business entity) or off-farm (new business ventures outside farming) (Vik & McElwee, 2011). The definition of unconventional businesses outside conventional farming (Ilbery, 1991) remains unclear, and a variety of meanings are used, as an alternative (McElwee & Smith, 2012) and non-traditional (Barbieri & Mahoney, 2009). Hence, there is a need to empirically define “conventional farming” to determine if a farm is diversified. However, this definition is expected to be time and geographical-dependent in what can be considered mainstream farming (Barnes et al., 2015). Attending to the lack of a clear operationalisation of the concept of farm diversification and based on the previous conclusions, our study proposes two categories of farm diversification: conventional and unconventional, covering agricultural and non-agricultural diversification.

We suggest that agricultural diversification can be classified as conventional, in terms of the farm income from two or more conventional agricultural businesses, and unconventional, comparing the additional business with the mainstream farming in the region analysed. Despite the various typologies, several studies had identified two types of agricultural diversification outside conventional farming. In essence, the first type covers the introduction

of unconventional crops, livestock or the adoption of unconventional agricultural practices, such as organic agriculture, while the second type involves the utilization of alternative marketing channels (Barbieri & Mahoney, 2009; Ilbery, 1991; McElwee & Smith, 2012). Our study proposes that those two categories could be applied not only to the analysis of unconventional but also conventional agricultural diversification.

The context may play an essential role in the diversification to unconventional crops, livestock and agricultural practices, as organic farming. In this sense, Carter (1998a) found that few farmers had chosen this type of diversification in the Cambridgeshire region of the United Kingdom. At the same time, Barbieri & Mahoney (2009) concluded that most of Texas farmers had businesses of this type on the United States. The diversification to unconventional crops, livestock and agricultural practices also seems to be related to the size of the farm since larger farms are more likely to engage in this type of diversification (Carter, 1998a). Nevertheless, organic farming may not be conventional when compared with mainstream farming in the region (Hansson et al., 2013), as well as the new crops or animals introduced by farmers (Bhaskaran, 2004; Okello, Lagerkvist, Kakuhenzire, Parker, & Schulte-Geldermann, 2018).

Another type of agricultural diversification is related to the utilization of conventional or alternative marketing channels. However, the definition of alternative marketing channels is ambiguous and different terms are used in the literature, namely direct marketing channels, short supply chains and Alternative Food Networks (AFN).

Direct marketing channels or even direct-to-consumer marketing channels are generally defined as the selling of agri-food products to consumers, without using intermediaries (Printezis & Grebitus, 2018). Concerning short agri-food supply chains, those are considered an alternative networking approach related not only to the distribution of agricultural products but also to the promotion of new production and consumption patterns, constituting a way for bridging the gap between farmers and consumers (Charatsari, Kitsios, Stafyla, Aidonis, & Lioutas, 2018). This definition is similar to AFN since these are defined as short supply chains where farmers sell their food products (Tudisca, Trapani, Sgroi, et al., 2014), ensuring high-quality products while promoting environmental conservation and the wellbeing of individuals and society (Migliore et al., 2015). Although those definitions are usually adopted in the literature, some studies include other customers besides consumers, as local retailers (e.g. Uematsu & Mishra, 2011).

Independently from the term used, researchers had identified various categories of alternative marketing channels: direct sales, farmers' markets, farm shops, vending machines, e-

commerce, solidarity purchasing groups or box schemes, “pick your own” (Tudisca, Trapani, Sgroi, et al., 2014), roadside sales, community-supported agriculture, on and off-farm events (Micheels & Boecker, 2017). The various perspectives state that the formation of alternative systems of food provision outside the conventional model of agriculture is essentially a short-circuiting of the conventional chain, through the development of new relationships between producers and consumers (Sonnino & Marsden, 2006).

The literature suggests that all direct marketing channels are unconventional. Nevertheless, in some regions, direct sales are largely used by agricultural entrepreneurs (Tudisca et al., 2015) as well as farmers’ markets (Micheels & Boecker, 2017). Direct marketing channels are especially crucial in farms of small-medium size, but these are also combined with long supply chains with the increase of farm size (Tudisca, Trapani, Sgroi, et al., 2014). Attending that produced quantities cannot be absorbed exclusively by local demand, many farmers use other sales methods, such as fruit and vegetable wholesale markets and contracts with large organized distribution (Tudisca et al., 2015). Thus, farmers use various direct and indirect marketing channels, but those should be compared to the mainstream channels of the region analysed to classify it as conventional or unconventional.

Based on previous studies, our study identifies non-agricultural diversification as another category of farm diversification, since it represents a distinct farm development path from agricultural diversification (Morris et al., 2017). Researchers had shown great interest by agritourism, although the type of non-agricultural businesses may depend on the country analysed, as care farms in the Netherlands (Dias et al., 2019b). Also, some non-agricultural businesses are not covered in some studies, namely in the works developed on Finland by H. T. Vesala & Vesala (2010) and on Sweden by Hansson et al. (2013). Those authors state that forestry is not seen as diversification activity since, in those countries, forestry is carried out on almost every farm. Nevertheless, the literature had neglected the analysis of both conventional and unconventional non-agricultural businesses, focusing on the analysis of the various types of non-agricultural businesses present on the context examined. Hence, our study proposes two general categories of non-agricultural businesses: conventional and unconventional, in terms of it is considered mainstream in the region analysed.

#### **4.2.2. Family portfolio entrepreneurship**

Farm diversification is related to portfolio entrepreneurship, whereby a person or group hold multiple separate businesses (Haugen & Jostein, 2008). It can be understood as the first step of a process of increasing business interests, which may be concluded through registration when they achieve maturity and scale (Carter, 1998a).

Various subject disciplines have addressed different portfolio entrepreneurship approaches (Carter & Ram, 2003). However, management literature has focused particularly on habitual entrepreneurship, comprising entrepreneurs who hold multiple businesses, in parallel (portfolio entrepreneurs) or sequentially (serial entrepreneurs) (Westhead & Wright, 1998). The characteristics of portfolio entrepreneurs are highlighted as they tend to identify more opportunities (Westhead, Ucbasaran, & Wright, 2009), to have stronger human capital (Carbonara, Tran, & Santarelli, 2020), more diverse experiences, resources and growth prospects (Westhead, Wright, & Binks, 2005), as well as an export profile (Robson, Akuetteh, Westhead, & Wright, 2014). In the agricultural sector, younger and better-educated owner-managers with larger farms are likely also to be portfolio entrepreneurs (Carter, 1998a).

In the context of family firms, not only human capital but also social capital seem to be positively associated with portfolio entrepreneurship, probably due to familiar connections (Sieger et al., 2011). Family entrepreneurs tend to engage more in portfolio entrepreneurship comparatively with non-family entrepreneurs, especially if they are female (C. Cruz & Justo, 2017), similarly to what happens in the agricultural sector (Carter, 1998a).

As the multiple businesses of farmers are not necessarily different legal entities (Vik & McElwee, 2011), it is needed to examine which businesses are related to the creation of new firms and those that are not (Carter, 1998a). In this sense, it is vital to examine not only farm diversification but also the farm-related firms of the farmer. Much of the literature is unclear in the distinction between the farm business, the farmer, and the farm household. Still, those three levels are particularly intertwined in family farms and influence one another in management decisions (Hansson et al., 2010). It is especially important to analyse farm-related firms of the other household members since, in the case of non-agricultural businesses (but not only), there are mainly related to other household members (Morris et al., 2017), and are a reflex from a household strategy rather than an individual farmer strategy (Haugen & Jostein, 2008). Hence, the type of farm businesses created by all members of the household as well as the type of family ties requires further understanding.

Our study proposes a framework related to the portfolio of farm and farm-related businesses (Figure 4.1). Farm diversification can be classified as conventional or unconventional compared to the mainstream on the region analysed, covering two categories: agricultural diversification and non-agricultural diversification. Besides, this framework includes the farm-related firms not only of the owner-manager but also of the other household members, considering the critical role of household members on the creation of farm businesses.

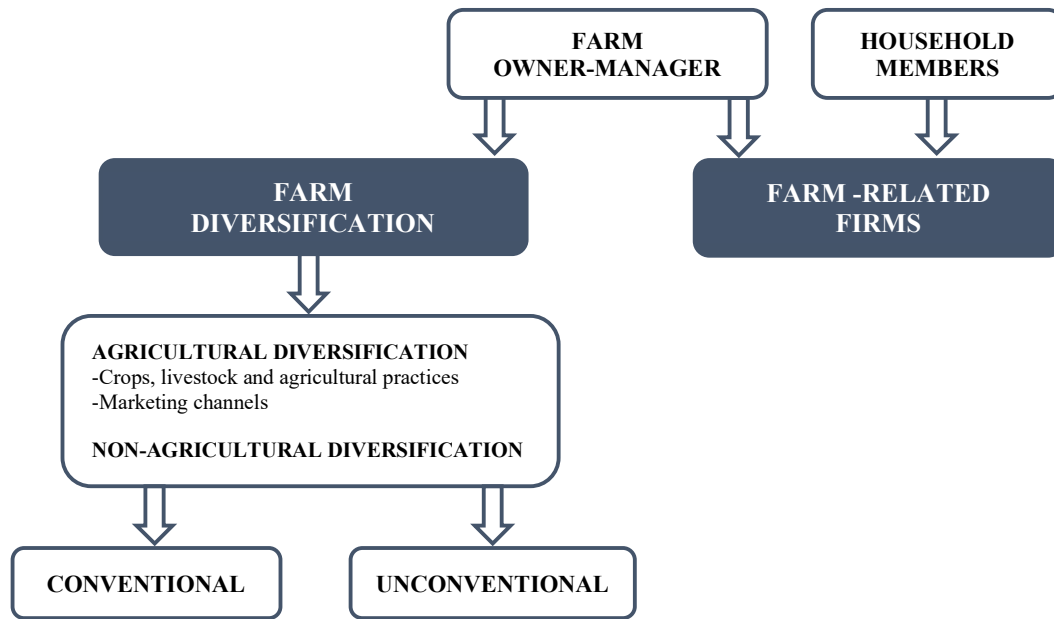


Figure 4.1 - Framework

## 4.3. Methods

### 4.3.1. Sample characteristics

Despite farm diversification has already been analysed at the regional level, the same not happen at the subsector level. Previous studies focused on diversification activities, independently from farms operating in the same agricultural subsector or not. However, each subsector has particularities, and it may influence diversification strategies. Hence, our study examines owner-managers that have in common the same agricultural business (fresh fruits) in the Beira Interior region.

Table 4.1 presents the characteristics of the sample. More than half of the 160 farmers interviewed produces more than one type of fresh fruit. At the same time, the majority beneficiates annually from Common Agricultural Policy (CAP) support, through the Single Farm Payment.

Table 4.1 - Sample characteristics

<b>Variable</b>	<b>Category</b>	<b>N°</b>	<b>%</b>
Production of more than one fresh fruits specie	Yes	92	57.5
	No	68	42.5
	<b>Total</b>	<b>160</b>	<b>100</b>
Single Farm Payment	Yes	142	88.7
	No	18	11.3
	<b>Total</b>	<b>160</b>	<b>100</b>

### **4.3.2. Analytical approach**

In traditional cluster analysis approaches, clusters are based on subjective distances between variables (within-cluster differences are minimized, and between-cluster differences are maximized), rather than objective fit criteria, which it is often subject to judgment calls (Stanley, Kellermanns, & Zellweger, 2016). Thus, researchers are using more model-based cluster analytic techniques, which offer more rigorous criteria for determining the number of clusters (Pastor et al., 2007), because are formulated as a probabilistic, finite mixture modelling approach for classifying objects (Brusco, Shireman, & Steinley, 2016).

Finite Mixture Model was used to categorise a heterogeneous sample into homogeneous groups or latent classes of individuals concerning a set of indicators (Ven, 2016). It assumes that the population consists of a finite and identifiable number of groups, each characterized by homogeneous preferences underlying their behaviour (Sands, Maggioni, Ferraro, Jebarajakirthy, & Dharmesti, 2019). Although it is conceptually similar to cluster analysis, group membership is examined as latent rather than known, and measurement error is allowed (Díaz-Montenegro et al., 2018). Latent Class Analysis (LCA) and Latent Profile Analysis (LPA) are the two basic types of the Finite Mixture Model. However, the indicators of latent class variables are continuous variables in LPA, while those in LCA are binary categorical variables (Ven, 2016).

LCA is appropriate for our study since it is based on six dichotomous questions of the type Yes/No: half are referred to conventional farming, and the other half assigned to unconventional farming. The respondent classifies the activity as unconventional, comparing it with the mainstream farming in the region analysed (Table 4.2). The LCA is useful because farmers are grouped into classes and can be studied as a segment of farmers rather than as individuals. The classes were compared attending to the characteristics of farm, owner-manager and household characteristics.

Table 4.2 - Operationalization of farm diversification (six questions of the type Yes/No)

<b>CATEGORY</b>	<b>Conventional</b>	<b>Unconventional</b>
<b>Agricultural diversification</b>	1-Besides fresh fruits, farm income, became from another conventional crop or animal? 2-Farm income from two or more conventional marketing channels?	4-Farm income from any unconventional crop, animal or agricultural practice? 5-Farm income from any unconventional marketing channel?
<b>Non-agricultural diversification</b>	3-Farm income from conventional non-agricultural businesses?	6-Farm income from unconventional non-agricultural businesses?

Our study uses the MPlus statistical package – version 8.0 (Muthén & Muthén, 2017) to perform LCA and SPSS (version 26) software to perform all statistical tests.

## **4.4. Results**

### **4.4.1. Description of farm businesses and farm-related firms**

Our study describes the farm activities, as well the farm-related firms of the owner and other household members (Table 4.3). Our work found that 10 percent of the owner-managers of fresh fruits farms have other farm-related firms, in line with previous studies on the field (Carter, 1998a), of which 50 percent curiously is also dedicated to fresh fruits. However, the majority is focused on non-agricultural activities (81.2 percent). Furthermore, 13.1 percent of the owner-managers are included in households whom other members have farm-related firms, essentially with fresh fruits (85.7 percent) and non-agricultural activities (71.4 percent). These numbers reflect a specialization of farm-related firms on those activities. Analysing the type of non-agricultural activities, we conclude that packaging is the main activity developed not only by farms (16.9 percent) but essentially by farm-related firms of other household members (38.1 percent) and of the owner-manager (31.3 percent), along with food processing (37.5 percent). Nevertheless, 60 percent of farms do not have non-agricultural activities.

Table 4.3 - Agricultural and non-agricultural businesses of farm and farm-related firms

Activities	Farm		Farm-related firms			
	N°	% Total	Farm owner-manager		Household members	
			N°	% Total	N°	% Total
<i>Agricultural activities</i>						
None	0	0	7	43.8	3	14.3
Fresh fruits	160	100	8	50	18	85.7
Other crops	82	51.3	2	12.5	5	23.8
Livestock production	8	5	0	0	0	0
<i>Non-agricultural activities</i>						
None	96	60	3	18.8	6	28.6
Packaging	27	16.9	5	31.3	8	38.1
Forest	24	15	1	6.3	4	19.1
Renewable energy	20	12.5	1	6.3	7	33.3
Food processing	15	9.4	6	37.5	3	14.3
Tourism	14	8.8	3	18.8	3	14.3
Contractual work	5	3.1	0	0	1	4.8
Food and beverage trade	3	1.9	0	0	1	4.8
Handicraft and non-food processing	2	1.3	6	12.5	2	9.5
<b>Total</b>	<b>n=160 (100%)</b>		<b>n=16 (10% of Total)</b>		<b>n=21 (13.1% of Total)</b>	

Our study found that all members of the household are involved in the family portfolio entrepreneurship (Figure 4.2). In this sense, the spouse is the household member that more contribute to the number of those firms, followed by husband, sons, fathers and brothers.

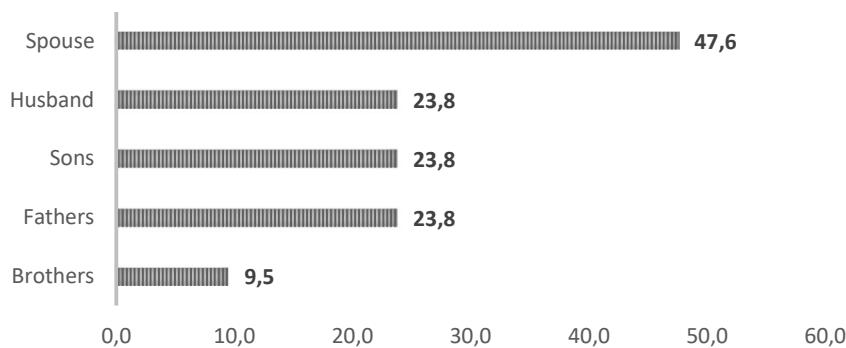


Figure 4.2 - Type of household members with farm-related firms (n=21)

#### 4.4.2. Latent Class Analysis

Frequencies and Spearman correlations of types of farm diversification are presented in Table 4.4. The highest correlation occurs between Conventional and Unconventional crops, animals and agricultural practices ( $r = -0.304$ ), although this is a negative correlation. Conventional marketing channels (73.1) and Conventional crops, animals and agricultural practices (51.3) report the highest frequencies, while the other variables present frequencies lowest than 0.5

namely “Unconventional non-agricultural diversification” (18.1). Diversification of marketing channels is highlighted, either in conventional (73.1) or unconventional (25) terms, even some farmers do not opt for this strategy. Non-agricultural diversification (conventional and unconventional) is the type of diversification with less importance.

Table 4.4 - Frequencies and Spearman correlations

	%	1	2	3	4	5
Conventional crops, animals and Agricultural practices	51.3					
Conventional marketing channels	73.1	.057				
Conventional non-agricultural diversification	31.9	.265**	.203*			
Unconventional crops, animals and Agricultural practices	29.4	-.304**	-.197*	-.117		
Unconventional marketing channels	25	-.101	-.041	.194*	.071	
Unconventional non-agricultural diversification	18.1	-.028	.139	.131	.231**	.290**

\* $p < 0.05$

\*\* $p < 0.01$

The optimal model was determined using the fit indices, like the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), the Lo–Mendell–Rubin adjusted Likelihood Ratio Test (LMR-LRT) and Bootstrap Likelihood Ratio Test (BLRT) (Gong, Li, Xie, & Tan, 2020; Rodrigues, Ferreira, & Felgueira, 2019). Smaller AIC and BIC values reflect a better model fit. Significant LMR-LRT and BLRT p values show that the  $k$  class model should be chosen than the  $k-1$  class model.

We follow previous studies that use the criterium of the minor BIC to prevent the problem of overfitting in smaller datasets (Ogliastri & Quintanilla, 2016; Seppälä, Hakanen, Tolvanen, & Demerouti, 2018). Despite the two and three-class model present the lower BIC values and a significant BLRT p-value, the three-class solution is the only one that shows a significant LMR-LRT p-value (Table 4.5). Besides, the size and interpretation of each class (Cuneo, Milberg, Alarcon-del-Amo, & Lopez-Belbeze, 2019; Gong et al., 2020; Nylund, Asparouhov, & Muthén, 2007) suggests that a three-class model is the best solution.

Table 4.5 - Fit indices for models covering 2 to 6 latent classes

Fit indices	2	3	4	5	6
AIC	1123.062	1104.495	1092.740	1087.399	1092.538
BIC	1163.039	1165.999	1175.770	1191.955	1218.620
LMR-LRT (p-value)	.054	.011	.273	.002	.109
BLRT (p-value)	.000	.000	.000	.000	.375

AIC: Akaike's Information Criterion

BIC: Bayesian Information Criterion

LMR-LRT: Lo–Mendell–Rubin adjusted Likelihood Ratio Test

BLRT: Bootstrap Likelihood Ratio Test

The main diagonal of Table 4.6 indicates the posterior probabilities that individuals fit their allocated classes and not to other classes (Stanley et al., 2016). In our study, those probabilities are high and ranges between 0.756 and 0.963, reflecting that each class is distinguishable from one another.

Table 4.6 - Posterior probabilities

<b>Class</b>	<b>1</b>	<b>2</b>	<b>3</b>
1	.852	.113	.035
2	.027	.963	.010
3	.051	.193	.756

The proportions for each type of diversification are displayed by class in Table 4.7 and Figure 4.3. Farmers can be grouped into three classes: Pioneers, Traditionalists and Diversifiers. Pioneers are the smallest group, comprising 20 percent of the sample. The highest level of diversification characterizes them to unconventional crops, animals and agricultural practices, as well by the lowest scores on the three conventional types of diversification. Traditionalists are the largest group, representing 58.1 percent of the sample. This group has high scores of conventional diversification to crops, animals and agricultural practices, as well to market channels while presenting the lowest levels on the three unconventional types of diversification. The last group is designated by Diversifiers, comprising 21.9 percent of the sample. They focus highly on diversification to market channels and non-agricultural activities, both in conventional and unconventional terms, although present also a high level of diversification to conventional crops, animals and agricultural practices.

Table 4.7 - Proportions of classes and Qui-square tests

	<b>Class 1</b> <b>n=32</b> <b>(20%)</b> <b>% Yes</b>	<b>Class 2</b> <b>n=93</b> <b>(58,1%)</b> <b>% Yes</b>	<b>Class 3</b> <b>n=35</b> <b>(21,9%)</b> <b>% Yes</b>	$\chi^2$	<b>p</b>
<i>Conventional</i>					
Crops, livestock and agricultural practices	3.1	65.6	57.1	37.806	.000***
Marketing channels	43.8	75.3	94.3	22.243	.000***
Non-agricultural activities	0	28	71.4	40.846	.000***
<i>Unconventional</i>					
Crops, livestock and agricultural practices	93.8	8.6	25.7	83.491	.000***
Marketing channels	40.6	0	77.1	85.919	.000***
Non-agricultural activities	21.9	2.2	57.1	52.201	.000***

\*\*\* $p < 0.001$

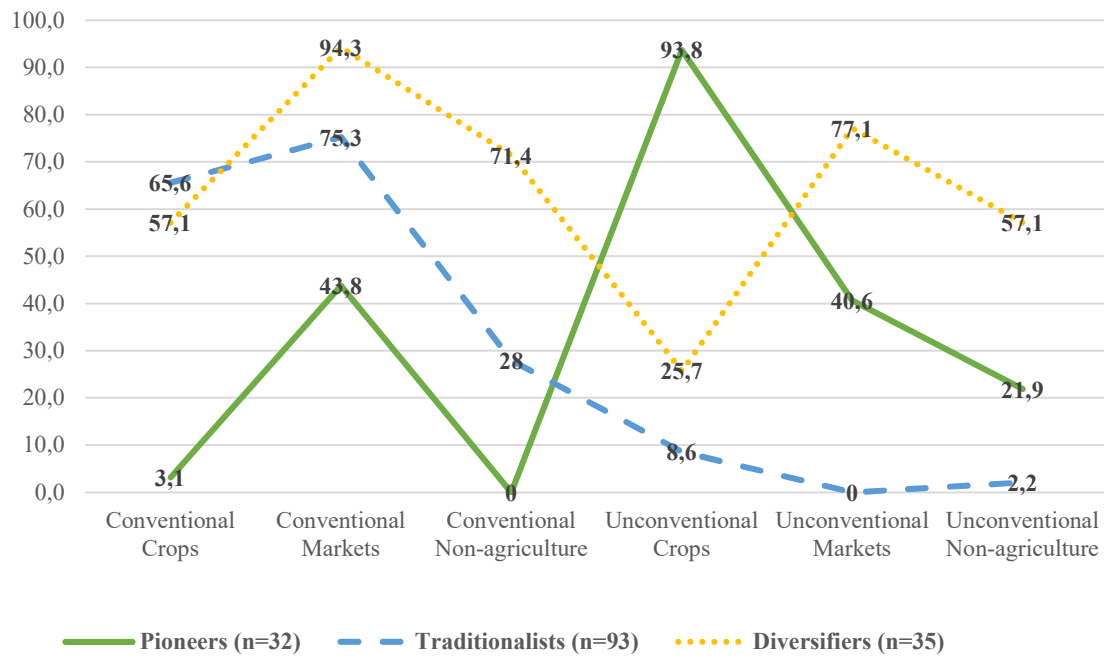


Figure 4.3 - Proportions of diversification for a three-class model (% Yes)

Tables 4.8, 4.9 and 4.10 report results from ANOVA, Brown-Forsythe, Chi-square and Fisher analysis, describing each of these classes in terms of the farm, owner-manager and household characteristics. Those analyses indicate significant differences between the three segments.

ANOVA and Brown-Forsythe tests show that there are significant differences among the three classes in permanent workers, total area, UAA, fresh fruits area, direct and indirect market channels, age, experience and household size since the p-value is less than 0.01 (Table 4.8). Pioneers have the highest means on permanent workers, household size and the three types of farm area, while Traditionalists have the lowest means on these variables. On the contrary, this last class presents the highest means of age and experience, whereas Pioneers account the lowest means. Diversifiers present the highest means on direct and indirect market channels.

Table 4.8 - ANOVA and Brown-Forsythe tests for farm, owners/managers and household characteristics

	<b>Pioneers</b>		<b>Traditionalists</b>		<b>Diversifiers</b>		<i>F</i> <sup>a</sup>	<i>F</i> <sub>BF</sub> <sup>b</sup>	<b>p</b>
	<b>n=32 (20%)</b>		<b>n=93 (58,1%)</b>		<b>n=35 (21,9%)</b>				
	<b>Mean</b>	<b>Std. dev.</b>	<b>Mean</b>	<b>Std. dev.</b>	<b>Mean</b>	<b>Std. dev.</b>			
<i>Farm characteristics</i>									
Permanent workers (N <sup>o</sup> )	1.97	2.32	0.44	1.21	1.77	2.62		72.989	0.001**
Area (ha)	36.54	23.11	14.94	19.33	25.42	24.79		11.070	0.000***
Utilised Agricultural Area (ha)	36.54	23.11	13.95	18.44	23.40	22.85		12.811	0.000***
Fresh Fruits Area (ha)	36.11	22.72	9.40	10.53	19.83	22.44		20.322	0.000***
Direct marketing channels (N <sup>o</sup> )	0.59	1.27	0.98	0.77	2.34	1.51		74.419	0.000***
Indirect marketing channels (N <sup>o</sup> )	1.56	0.88	1.25	0.72	1.94	1.26		74.056	0.003**
<i>Owner/manager characteristics</i>									
Age (years)	42.72	10.66	58.56	13.08	49.54	11.31	22.111		0.000***
Experience (years)	10.69	6.73	18.42	11.73	15.94	12.15		75.381	0.000***
<i>Household characteristics</i>									
Household size (N <sup>o</sup> )	3.44	1.11	2.52	0.95	3.11	0.99	12.081		0.000***

<sup>a</sup>ANOVA test

<sup>b</sup>Brown-Forsythe test

\*\**p* < 0.01

\*\*\**p* < 0.001

The chi-square analyses suggest that there are no significant differences across the three classes in gender, off-farm employment of the owner-manager and other household members since the p-value is higher than 0.05 (Table 4.9). In all classes, generally, the owner-managers are men and have not an off-farm-employment. However, the weight of off-farm employment is lower in the Traditionalists class, while the proportion of other household members off-farm employed is higher in the Diversifiers classes.

Table 4.9 - Qui-square tests for farm, owners/managers and household characteristics

	<b>Pioneers</b> n=32 %	<b>Traditionalists</b> n=93 %	<b>Diversifiers</b> n=35 %	$\chi^2$	<i>p</i>
<i>Farm characteristics</i>					
Main type of geographic market					
Regional	56.3	49.5	25.7	7.601	0.022*
National	43.7	50.5	74.3		
Food labels					
Yes	100	58.1	82.9	23.385	0.000***
No	0	41.9	17.1		
<i>Owner/manager characteristics</i>					
Gender					
Men	71.9	72	69	0.157	0.924
Women	28.1	28	31		
Education level					
No complete level	9.4	58.1	34.3	29.014	0.000***
Basic/Secondary	40.6	24.7	45.7		
Higher	50	17.2	20		
Off-farm employment					
Yes	43.7	24.7	28.6	4.165	0.125
No	56.3	75.3	71.4		
<i>Household characteristics</i>					
Farm or farm-related activities as the main income source					
Yes	59.4	44.1	25.7	9.839	0.007**
No	40.6	55.9	74.3		
Off-farm employment of other household members					
Yes	53.1	36.6	54.3	4.676	0.097
No	46.9	63.4	45.7		

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

Farms operating in regional markets, managed by farmers with a higher level of education and whose main household income source came from farm activities, are more likely to be part of Pioneers class. Owner-managers with no complete level of education are more expected to be included in the Traditionalists class. Farms operating in national markets and not constituting the main household income source are more likely to fall into the Diversifiers class. A larger

proportion of farms included in the Pioneers and Diversifiers classes have food labels, while this proportion decreases in the Traditionalists class.

Fisher tests show that the differences among the three classes are significant in almost types of direct and indirect marketing channels, non-agricultural activities, food labels and characteristics of household income (Table 4.10). It is crucial to understand the contribution of the farm or farm-related activities to household income. Hence, our study found that Pioneers present the large proportion of farm-related firms, especially firms owned by other household members. At the same time, Diversifiers have the highest proportion of household members as permanent workers, although this value is not very high.

Diversifiers have a large proportion of direct marketing channels like direct sales, pick-your-own, on and off-farm events, as well as indirect marketing channels such as wholesale markets and resellers of other regions. Non-agricultural activities like packaging, food processing, renewable energy and tourism are also emphasised in this class. Although direct sales are the main direct marketing channel in the three classes, wholesaler markets are the principal indirect marketing channel only for Traditionalists and Diversifiers. At the same time, Pioneers focus more on Producer Organizations and Familiar Packaging and Marketing Units.

The main label is Integrated farming in all classes. It allows for selling products to large distribution and obtaining relatively higher prices, optimising the balance between environmental and economic requirements. This implies that chemicals are applied in doses, times and with distribution techniques according to the real needs of crops (Tasca, Nessi, & Rigamonti, 2017). Still, Pioneers have the highest proportion of this label along with GlobalGap label.

Table 4.10 - Fisher tests for farm and household characteristics

Variable	Pioneers	Traditionalists	Diversifiers	FI	p
	n=32 % Yes	n=93 % Yes	n=35 % Yes		
<i>Farm characteristics</i>					
Direct marketing channels					
Direct sales	34.4	69.9	77.1	15.470	0.000***
Off-farm events	6.3	0	45.7	45.721	0.000***
Pick your own	3.1	3.2	31.4	19.703	0.000***
On-farm events	6.3	0	28.6	25.697	0.000***
Farmers' markets	0	11.8	17.1	6.256	0.047*
Door-to-door sales	3.1	6.5	5.7	0.397	0.898
Itinerant sales	0	3.2	5.7	1.567	0.485
Roadside sales	0	3.2	5.7	1.567	0.485
E-commerce	6.3	0	2.9	5.143	0.043*
Off-farm shop	0	0	8.6	7.094	0.017*
On-farm shop	0	0	5.7	4.760	0.086
Indirect marketing channels					
Wholesale markets	15.6	50.5	68.6	20.454	0.000***
Producer Organizations	50	23.7	5.7	17.602	0.000***
Resellers of other regions	9.4	14	31.4	6.365	0.039*
Familiar Packaging and	31.3	0	5.7	27.425	0.000***
Marketing Units					
Other farmers	9.4	22.6	11.4	3.656	0.165
Industry	18.8	6.5	20	6.532	0.038*
Small retail	9.4	5.4	20	5.886	0.048*
Large retail	6.3	1.1	11.4	6.720	0.020*
Hotels, restaurants, cafeterias	0	1.1	11.4	7.094	0.022*
Exportation	6.3	0	8.6	7.905	0.012*
Food labels					
Integrated farming	100	57	82.9	28.921	0.000***
GlobalGap	53.1	4.3	8.6	36.717	0.000***
Others	25	1.1	0	19.606	0.000***
Non-agricultural activities					
Packaging	3.1	10.8	45.7	23.445	0.000***
Food processing	3.1	1.1	37.1	31.657	0.000***
Renewable energy	15.6	3.2	34.3	21.072	0.000***
Tourism	6.3	1.1	31.4	24.276	0.000***
Forest	0	20.4	14.3	9.380	0.009**
Contractual work	0	2.2	8.6	3.596	0.159
Food and beverage trade	0	1.1	5.7	2.824	0.223
Handicraft and non-food	3.1	1.1	0	1.540	0.408
processing					
<i>Household characteristics</i>					
Other household members	18.8	3.2	22.9	13.409	0.001**
as permanent workers					
Farm-related firms					
Owner-manager	28.1	2.2	14.3	17.770	0.000***
Other household members	43.8	2.2	14.3	31.795	0.000***

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

## 4.5. Discussion

Our work has contributed to a better understanding of the activities developed on farm-related firms and the influence of the familiar relations on their creation. Although previous studies noted that farm-related firms are focused on non-agricultural activities (Dias et al., 2019b), our study found that those are also dedicated to the core business of the primary farms (fresh fruits). This may be due to financial reasons, including not only fiscal aspects (Carter & Ram,

2003) but also the access to the Common Agricultural Policy (CAP) start-up scheme (Zagata & Sutherland, 2015). Contrary to the conclusions of Carter (1998), the packaging is the principal non-agricultural activity developed by farms and farm-related firms. This occurs because many small and medium farms sell fresh fruits to larger farms or even familiar packaging and marketing units, owned by other household members, with better refrigeration and transportation equipment as well as better access to large distribution (Dias et al., 2017). The role of women had already been identified as very important in family portfolio entrepreneurship (C. Cruz & Justo, 2017; Lans et al., 2017), although our study concludes that spouse, husband, sons, fathers and brothers are all involved in this process.

We provided an original framework that operationalizes the conventional and unconventional nature of farm diversification, surveying a context unexplored until now. Based on this framework, our study found three classes of farmers: Pioneers, Traditionalists and Diversifiers. In all classes, owner-managers generally not have an off-farm-employment and use direct sales as the principal direct marketing channel. This channel is widely spread in the region as it happens in other European regions (Tudisca et al., 2015).

Traditionalists are predominant, characterized by a higher level of conventional diversification to crops, animals and agricultural practices, as well to marketing channels. They are more likely to be older, with large experience, low level of education and with small farms (Carter, 1998a, 2001; Morris et al., 2017). This class use conventional marketing channels like direct sales and wholesaler markets (Micheels & Boecker, 2017; Tudisca, Trapani, Sgroi, et al., 2014).

Pioneers are focused on the diversification to unconventional crops, animals and agricultural practices. This class is characterized by larger farms with more permanent workers, managed by younger and better-educated people (Carter, 1998a, 2001). Although previous studies highlight organic farming (Barbieri & Mahoney, 2009; Ilbery, 1991; McElwee & Smith, 2012), our study show that some other agricultural practices or labels as GlobalGap may reveal a more unconventional approach of larger farmers in a particular region. This label is promoted mainly by European retailers, allowing a farm to export its products to high-income countries (Andersson, 2018).

In Portugal, sales to cooperatives or other producer organizations never have the level of importance as in other European countries (Brusselaers et al., 2014), although in the last years new forms of private management attracted producers of large dimension to those organizations as seems to happen with Pioneers. Thus, this class focus on regional markets, selling mainly to Producer Organizations as well as Familiar Packaging and Marketing Units.

As those units partially export their products, Pioneers must invest in certifications as GlobalGap.

Previous studies reach different conclusions about the influence of farm diversification on the total household income (Clark, 2009; Rønning & Kolvereid, 2006), which may be related to different profiles of diversification and the creation of farm-related firms. Our study found that Pioneers tend to create farm-related firms, namely Familiar Packaging and Marketing Units owned by them and essentially by other household members, which may explain that the main household income source came from the farm or farm-related activities in this class. According to the characteristics of the Pioneers class, our study demonstrate that younger and better-educated owner-managers with larger farms are more engaged in portfolio entrepreneurship (Carbonara et al., 2020; Carter, 1998a).

Diversifiers opt to diversify market channels and non-agricultural activities, both in conventional and unconventional terms. As this class presents a high proportion of other household members off-farm employed, their primary household income source is not generally from farm activities. Previous studies state the crucial role of women on the development of non-agricultural businesses, especially agritourism (Pettersson & Cassel, 2014; Seuneke et al., 2013), while others emphasize the role of younger and better-educated farmers in those businesses (Hassink, Grin, et al., 2016; Renting et al., 2008). However, in the Diversifiers class, middle-aged men with elementary/secondary education are highlighted. In this sense, when it occurs simultaneously diversification to non-agricultural activities and diversification of marketing channels, the owner-manager characteristics seems to be different compared to farms diversifying only to non-agricultural businesses.

Diversifiers have various non-agricultural activities as packaging, food processing, renewable energy and tourism. They sell mostly in national markets, namely to wholesaler markets and to resellers from other regions, although they use a broad set of marketing channels. Besides indirect channels, this class focus also on direct marketing channels which may be conventional as direct sales and pick-your-own, or unconventional as on and off-farm events. Off-farm events reflect the participation of farmers on the various tourist events promoted in the region like food fairs (Alves, Campón Cerro, & Martins, 2010). Those are often related to on-farm events, since that the same tourists that visit food fairs are also engaged in events promoted by farmers on their farms, benefiting from partnerships with regional tourist players as public institutions, hotels and travel agencies.

Hence, farmers follow different diversification strategies which reflect different farm, owner-manager and household characteristics.

## **4.6. Conclusions**

Due to the complexity of many farm businesses, our study examined which of those businesses are linked to the creation of other farm-related firms and which the role of family members on starting those firms. We found that farm-related firms are not only related to non-agricultural activities (Dias et al., 2019b) but also to fresh fruits, the core business of the primary farms. Besides the important role of the spouse, all the other family relations in the household are crucial in the creation of new businesses (Aldrich & Cliff, 2003).

As the various farm or farm-related businesses are not often different legal units, farm portfolio entrepreneurs must be analysed differently from other sectors (Vik & McElwee, 2011). Some of those businesses have specific markets and specific resources, often managed by other household members that play an invisible role in the business registration statistics. The development of new farm businesses can be recognised as an entrepreneurial process, involving many of the same challenges faced by any new business formation process (Ferguson & Hansson, 2015). Nevertheless, the creation of new ventures outside conventional farm businesses requires a more entrepreneurial approach, evolving a creative process that requires contracts with new customers and/or suppliers, new marketing channels and reorganisation of the management in the business (Hansson et al., 2013).

Based on an original framework that operationalizes farm diversification in conventional and unconventional terms, our study found three classes of farmers: Pioneers, Traditionalists and Diversifiers. This last class is characterized by the diversification of market channels and non-agricultural activities, independently from their conventional or unconventional nature. Pioneers enhance family portfolio entrepreneurship while diversifying to unconventional crops, animals and agricultural practices. Traditionalists opt for this type of diversification as well to marketing channels, although both in conventional terms. Even neglecting more unconventional approaches, farm diversification of Traditionalists is essential to the economic sustainability of smaller farms, and the enhancement of cultural and traditional features of rural zones (García-Cornejo et al., 2020). Still, the diversification, conventional or not, to more direct channels besides direct sales may contribute to improving their performance.

All classes of farmers adopt a limited variety of food labels, although it may be an important branding strategy to create value including by small farmers. The few importance of organic farming in our study may suggest that this label is hard to implement in the sector of fresh

fruits, compared with others as horticulture and livestock sectors (Lobley, Butler, & Reed, 2009; Mahindaratne & Gunaratne, 2015). To produce fresh fruits on a large scale according to environmental and environmental standards, Integrated farming seems to be more appropriate (Tasca et al., 2017). In contrast, organic farming is more oriented to market niches, and smaller farms may implement it. Although it is predominant in all classes of farmers, Integrated farming is faced as a business-to-business label and is not recognized generally by consumers, which constitutes the main barrier to their direct purchase to farmers (Brach, Walsh, & Shaw, 2017). As the main difficulty in implementing food certifications by farmers seems to be the financial costs (Brach et al., 2017), the role played by local associations, public institutions and scientific organizations may be crucial, namely in promoting geographical indications (Quiñones-Ruiz et al., 2016).

More training programmes on entrepreneurship and marketing must be promoted not only by future CAP reforms (Yoshida et al., 2019), but also by universities and research institutes since farmers became more open to implementing new practices (Sutter, Webb, Kistruck, Ketchen, & Ireland, 2017) and marketing channels with training. Those programmes may enhance e-commerce, along with other direct channels like farmers' markets which role in the region was significant in the past. Local institutions related to the agricultural sector could follow other European regions, where farmers' markets are highly promoted to support small farms and create a more direct connection between producers and consumers (Tasca et al., 2017; Tolstad, 2014; Tudisca, Trapani, Sgroi, et al., 2014). Simultaneously, those local institutions should continue to promote tourism events (Mshenga & Richardson, 2013) in the region, which was enhanced unconventional direct channels like on and off-farm events, and even non-agricultural activities as agritourism.

#### **4.7. Limitations and future research lines**

Our study has limitations. The conventional or unconventional nature of farm diversification was self-reported, which is mitigated through the choice of a sample of farmers integrating a particular sector in a particular region that they know well. Future studies should define quantitative measures related to the conventional and unconventional aspects of farm diversification. These studies may allow making comparative studies between agricultural sectors, regions or countries. Further, our work found that the principal non-agricultural business developed by farmers (packaging) is closely related to the needs of the fresh products sector in the Beira Interior region. Thus, more research is needed to identify which types of non-agricultural businesses are related to each agricultural subsector.

Our study shows the importance of all household members in the creation of farm-related firms, including agricultural firms. Nevertheless, further studies must study family portfolio entrepreneurship, including not only a single household but also the familiar relations with other households (Estrada-Robles et al., 2020), where often occurs the share of agricultural equipment and labour which may enhance the creation of new farm-related firms. The differences between portfolio and serial entrepreneurs should also be analysed.

The owner-manager characteristics of farms that diversify simultaneously non-agricultural activities and marketing channels, seem to be different when compared to farms diversifying only to non-agricultural businesses (Hassink, Grin, et al., 2016; Pettersson & Cassel, 2014; Seuneke et al., 2013), tending to be a middle-aged man with primary or secondary education. Future studies should examine the association between marketing channels and non-agricultural activities, attending to the role of gender, education and farm size. More research is needed about the unconventional nature of the various food labels adopted by farmers, focusing not only on organic farming but also on GlobalGap and others. Researchers must analyse the association between food labels and marketing channels in different agricultural subsectors.

# **Chapter 5 - Enhancing the environmental and financial performance of small agricultural businesses**

## **5.1. Introduction**

Contrary to the case over an extended period, mainstream entrepreneurship studies have demonstrated an increasing interest in the agricultural sector in recent years (Dias et al., 2019b). It is indeed exciting to examine how agricultural entrepreneurs deploy and reorganize resources and capabilities particularly as agriculture has economic and environmental particularities, especially strict rules and laws, mature markets, in addition to a higher environmental impact in comparison with other industries (Pindado & Sánchez, 2017).

Agricultural firms face financial constraints and increasing environmental pressures to accomplish various goals from both institutions and consumers, especially in Europe, which influence their business strategy and performance (Morris et al., 2017). In this sense, various firms are exploring opportunities that reach beyond environmental rules and correspondingly implementing a range of practices related to the development of sustainable products, the decrease of energy consumption, and the mitigation of the ecological footprint (Albertini, 2013).

Our study provides several contributions. Empirical studies that examine the association between Entrepreneurial Orientation (EO) and both the financial and environmental performance of organizations are scarce despite environmental approaches potentially making a positive contribution to their levels of financial and environmental performance (Roxas et al., 2017; Yu et al., 2017). It is thus essential to grasp the entrepreneurial processes ongoing in agricultural firms in keeping with their particular resources, requirements and organizational approaches, in particular just how agricultural entrepreneurs deal with the recent transition to more market-oriented agriculture (Pindado & Sánchez, 2017) based on higher environmental standards. Hence, this article responds to recent calls for further studies examining the role that the resources and capabilities of farms (Dias, Rodrigues, & Ferreira, 2019a; Dias et al., 2019b; Pindado & Sánchez, 2017; Pindado et al., 2018) play in enhancing environmental and financial performance.

Taking into account the general lack of studies on agricultural entrepreneurship with an explicitly theoretical framework (Fitz-koch et al., 2018), our study maintains that we may examine the role the resources and capabilities of agricultural entrepreneurs play in both environmental and financial performance through the Natural Resource-Based-View (NRBV) (Hart & Dowell, 2011) and the Dynamic Capabilities (DCs) approach (Teece et al., 1997). According to NRBV, firms may achieve competitive advantage through improving their environmental sustainability (Hart, 1995). Still, appropriate DCs are required to reorganize their resources, and reconfiguring farm businesses in new scenarios while fostering new ways to attenuate the lack of resources available to small farms (Grande, 2011).

Our study focuses on an unexplored context. Due to their small scale, the Portuguese agricultural sector lacks the organization structure to compete on a large scale even while farmers go about exploring the opportunities provided by the excellent natural conditions of the country. Based on a sample of 160 small farms located in inland Portugal, we deployed a partial-least-square, structural-equation model (PLS-SEM) to analyze how DCs, EO and Environmental Sustainability Commitment are associated with improving the financial and environmental performance of farm businesses. Despite many entrepreneurs do not realize of their impacts on the environment and have few resources to respond to environmental challenges (Mupfasoni, Kessler, & Lans, 2018), our study reports that farms can establish competitive advantages through the improvement of environmental sustainability as proposed by the Natural Resource-Based-View (NRBV). Farmers are also developing DCs, although R&D Capabilities focus on environmental performance to the detriment of financial performance, which may stem from the environmental requirements prevailing in agricultural markets.

## **5.2. Literature review and research hypotheses**

### **5.2.1. Natural Resource-Based-View (NRBV)**

The Resource-Based-View (RBV) underlines how resources and capabilities determine a firm's competitive advantage. Resources comprise not only the financial and physical assets but also worker skills and organizational processes. In contrast, a capability is something a firm can perform, supported on their resources and routines (Hart & Dowell, 2011). According to the RBV, a resource should be valuable, rare, inimitable and based on tacit skills or organizational procedures for firms to achieve superior level performance (Barney, 1991, 2001). In this sense, the core argument of RBV is that firms deploy heterogeneous resources and capabilities, which are difficult to copy or move between them (Grande et al., 2011).

However, the RBV neglected the link between firms and their bio-physical surroundings, leading to the proposition of the Natural Resource-Based-View (NRBV), which suggests that organizations can create competitive advantages through mitigating their impacts on the environment (Hart, 1995). NRBV thereby constitutes an evolution of the RBV in stating that the competitive positioning of firms with environmental concerns can arise from resources and capabilities that are valuable, rare, and inimitable (Barney, 1991; Wong, Lai, Shang, Lu, & Leung, 2012).

Environmental strategies may drive competitive advantages through the reduction of costs or product differentiation (Albertini, 2013). Environmentally sustainable production methods can become the means of reducing costs, especially resulting from lower levels of energy consumption, in addition to firms differentiating their products from their competitors in environmental terms by paying attention to product and market aspects (Albertini, 2013). Hence, NRBV underlines how resources and capabilities of firms prevent pollution and contribute to sustainable development, improving competitive performance standards (Hart, 1995). Nevertheless, the effect of environmental management on performance remains contentious (Roxas et al., 2017) as measures differentiating a product from the competition may significantly increase the operating costs of businesses (Chan, 2005).

The literature has already identified Entrepreneurial Orientation (EO) as fundamental in environmentally sustainable small and medium-sized companies (SMEs), and capable of positively influencing performance (Roxas et al., 2017). Organizational orientations reflect one of the most important intangible assets as these skill sets are closely involved in the daily routines of firms (Zhou, Li, Zhou, & Su, 2008), are not easy to reproduce by the competition and consequently lead to sustainable advantages (Kropp, Lindsay, & Shoham, 2006).

This study deploys the NRBV, and the Dynamic Capabilities (DCs) approaches, stating that EO and DC are crucial to improving the financial and environmental performance of agricultural businesses. DCs differ from “ordinary” capabilities and resources as they enable the organization to restructure their existing resources and basic capabilities (Teece et al., 1997). DCs hold relevance not only for firms facing hyper turbulent environments but also other types of environments meeting the current need of most sectors to respond to continuous changes (Helfat & Peteraf, 2009), including in the agricultural sector that faces heavy competition requiring the continuous adaptation of farm strategies (Grande, 2011).

The NRBV allows for analyzing the resources and capabilities and their relationships to environmental and financial performance (Hart & Dowell, 2011). As organizations may sustain

their performance whenever holding the capability to exploit as well to preserve natural resources (Wong et al., 2012), the DC perspective enables the examination of how agricultural entrepreneurs reconfigure farm resources to raise their financial and environmental performance levels. Hence, NRBV and DCs emerge as complementary in their examination of how agricultural businesses may create value.

### **5.2.2. Dynamic Capabilities**

The entrepreneurial process is determined by the firm's capabilities (Ruiz-Ortega, Parra-Requena, Rodrigo-Alarcón, & García-Villaverde, 2013). Following how competitive advantage in dynamic environments stems from Dynamic Capabilities (DCs) (Teece, 2007), it is essential to grasp how some organizations manage to continuously exploit business opportunities (Rodrigo-Alarcón, García-Villaverde, Ruiz-Ortega, & Parra-Requena, 2018).

Some farmers lack the appropriate entrepreneurial skills (McElwee, 2008) and hence entrepreneurs need to develop the DCs able to reconfigure farm resources, especially marketing capabilities (MCs) and R&D capabilities (RDCs) (Dias et al., 2019b; Grande et al., 2011). As regards exploring new markets, developing and selling new products and services often require different usages of resources as well as changes to the firm's organization (Easterbye-Smith, Lyles, & Peteraf, 2009), MCs may be particularly immobile, inimitable, and non-substitutable (S. L. Martin & Javalgi, 2016). MCs are indeed essential to the extent that they enable organizations to produce and disseminate market information and adapt to client needs (Moorman & Slotegraaf, 1999) in addition to potentially fostering long-lasting relationships with clients (Day, 1994). RDCs also constitute a fundamental factor to the development of new technological abilities, specifically the identification of new technologies, the recruitment of specialized scientists, and the implementation of novel types of production processes (Bendig, Strese, Flatten, Da Costa, & Brettel, 2017; Danneels, 2008). These capabilities shape the processes that allow firms to create novel technical knowledge, recombine it with present technology, and develop premium products (Kemper, Schilke, & Brettel, 2013).

Farmers have furthermore had to respond to recent shifts in the market, sustainability, food safety and biotechnology (Lans et al., 2017). The higher complexity of food marketing and distribution, with various labels and certification programs, as organic and genetic modification-free, requires agricultural entrepreneur generate greater value and update their processes (Lewis et al., 2014). In this sense, MCs and RDCs enable organizations to take actions and become more innovative, proactive and risk-taking (Ruiz-Ortega et al., 2013) through adopting various entrepreneurial strategies, such as the diversification of market channels,

innovation and environmental protection (Dias et al., 2019b). Firms with strong MCs and RDCs tend to perceive environmental commitment as an opportunity, and correspondingly develop new green products or include the green aspects in existing products that respond to current consumer needs (Hirunyawipada & Xiong, 2018; Kang & He, 2018).

Given the new technological advances impacting on agricultural production (Vik & McElwee, 2011), strong RDCs enable firms to develop more efficient production processes and differentiate their products from the competition and boost their levels of financial (Kemper et al., 2013) and environmental performance (Hart & Dowell, 2011). MCs interlink with the market knowledge (Ruiz-Ortega, García-Villaverde, & Parra-Requena, 2018) that allows farm firms to respond to recent changes in the agricultural markets, and establish advantages in their customer relationships (Spanos & Lioukas, 2001). This positively contributes to firm performance both in financial (Wilden & Gudergan, 2015) and environmental (Yu & Ramanathan, 2016) terms. Hence, MCs and RDCs increase performance in keeping with the capacity for advanced technology to bring about increases in production quality and produce new products able to attract higher prices. At the same time, MCs may raise sales of those products (Jin, Jung, & Jeong, 2018).

***Hypothesis 1:*** Dynamic Capabilities (Marketing and R&D Capabilities) are associated with Entrepreneurial Orientation.

***Hypothesis 2:*** Dynamic Capabilities (Marketing and R&D Capabilities) are associated with Environmental Sustainability Commitment.

***Hypothesis 3:*** Dynamic Capabilities (Marketing and R&D Capabilities) are associated with a) Environmental Performance; and b) Financial Performance.

### **5.2.3. Entrepreneurial Orientation**

The definition of Entrepreneurial Orientation (EO) involves the strategic entrepreneurial processes deployed by the main decision-makers to apply their structural goals, implement their vision, and develop a competitive advantage (Rauch et al., 2009). EO undergoes operationalization through multiple ways, but there would seem an increasing consensus that EO incorporates a construct composed of three subconstructs (innovativeness, proactiveness and risk-taking) (Rauch et al., 2009), including in agriculture (Grande et al., 2011; Ishak et al., 2015; Pindado & Sánchez, 2017; Veidal & Flaten, 2014a). The few studies analyzing the EO-Performance relationship in the agricultural sector reach different conclusions (Grande et al., 2011; Veidal & Flaten, 2014a), while the vast majority of the literature findings on EO conclude that this generates positive impacts on the organizational performance (Rauch et al., 2009).

Contrary to the positive impact of EO on financial performance, the role of EO in environmental strategies and environmental performance remains unclear (Dickel, 2018). Firms with a strong environmental commitment need proactive, innovative and risk-taking owner-managers (Roxas et al., 2017), seeking for creative ways to do business and to compensate their relative lack of resources (Dickel, 2018). Thus, entrepreneurial activities may limit environmental degradation and generate economic value by deepening the environmental commitment prevailing (Jiang, Chai, Shao, & Feng, 2018), especially in sectors with major impacts on the environment, such as the agricultural sector.

Innovativeness reflects the willingness of firms to explore new business ideas, products and services, thereby highlighting issues including market research, product design and promotion (Lumpkin & Dess, 1996). New ideas are crucial for farmers even though they may not necessarily new be to other players in the agricultural sector (Gellynck et al., 2015). Thus, in recent years, farmers have been presenting innovative products to customers including not only new crops and cultivars (Micheels & Nolan, 2016) but also new forms of packaging and branding (Lewis et al., 2014) that may take environmental issues into account. Other farmers are now processing fresh goods, essentially whenever in surplus, resulting in new products, such as sweets or liquors (Tripathi & Agarwal, 2014) and reducing food wastes. Hence, innovation brings about a positive influence on farm performance (Gellynck et al., 2015).

Proactiveness encapsulates the exploration of business opportunities based on the anticipation of future needs, generally before the competition (Lumpkin & Dess, 1996), which enables firms to achieve competitive advantages in turbulent environments (C. L. Wang, 2008). Proactive firms are often the first whether entering new markets or introducing innovations (Lumpkin & Dess, 1996), including new techniques, technologies and production methods (Courrent, Chasse, Waleed, Chassé, & Omri, 2016), that increasingly consider environmental requirements. Furthermore, proactive farmers continually strive to introduce, before their competitors, new crops or cultivars appreciated by customers and appropriately adapted to the natural environment as the crop or cultivar portfolio structure substantially determines the performance of farms (Jaeck & Lifran, 2013).

Risk-taking reflects the prevailing manager preferences for audacious and risky opportunities rather than cautious acts within the scope of obtaining the objectives set (Courrent et al., 2016; Lumpkin & Dess, 1996). Some authors state that agricultural entrepreneurs are more averse to risk as to the uncertainty of agricultural markets and climate conditions already influence their incomes (Chavas & Holt, 1996). However, other authors conclude that farmers are not more averse to risk than other entrepreneurs (Pindado & Sánchez, 2017), responding audaciously to

shifts in food safety and consumer habits (Lans et al., 2017). When successful, high-risk projects bring in substantial profits (Courrent et al., 2016) while potentially involving the introduction of unfamiliar technologies or new product sales in new markets (Lumpkin & Dess, 1996). This may increase not only the financial performance but also the environmental performance as the trade in agricultural products increasingly requires the implementation of new environmental standards.

**Hypothesis 4:** Entrepreneurial Orientation is associated with Environmental Sustainability Commitment.

**Hypothesis 5:** Entrepreneurial Orientation is associated with a) Environmental Performance; and b) Financial Performance.

#### **5.2.4. Environmental Sustainability Commitment**

The environmental sustainability strategies of organizations provide for restructuring their settings, procedures and activities to attenuate their adverse effects on the environment (Roxas et al., 2017). The Environmental Sustainability Commitment (ESC) is an important firm resource that reflects the organizational engagement with this strategy, contributing to its effective implementation (Carrillo-Higueras, Prajogo, & Smith, 2018; Chen, Tang, Jin, Li, & Paille, 2014). Organizations with strong ESCs are more focused on preventing rather than reacting to pollution and voluntarily seek to decrease their environmental impacts, and going beyond legislative requirements (Carrillo-Higueras et al., 2018).

Agriculture has deeper impacts on the environment than other activities as their practices are based and developed on land (H.-C. Lee et al., 2007; Pindado & Sánchez, 2017). Nevertheless, actions taken by agricultural entrepreneurs in recent years have focused on mitigating those impacts. Some important actions include increasing carbon sequestration, developing renewable energy sources and the significant growth in organic farming, enhanced by institutional support and farmer-level concerns over biodiversity and sustainability (H.-C. Lee et al., 2007; Schwindenhammer, 2017). As higher ESCs require efficiency in the utilization of resources, reductions in waste and less pollution (Carrillo-Higueras et al., 2018), this improves the environmental and financial performance of firms.

**Hypothesis 6:** Environmental Sustainability Commitment is associated with a) Environmental Performance; and b) Financial Performance.

The research model (Figure 5.1) derives theoretically from the Natural Resource-Based-View (NRBV), and interrelates Dynamic Capabilities (DC), Entrepreneurial Orientation (EO),

Environmental Sustainability Commitment (ESC) and the Performance (Environmental and Financial) of farm firms.

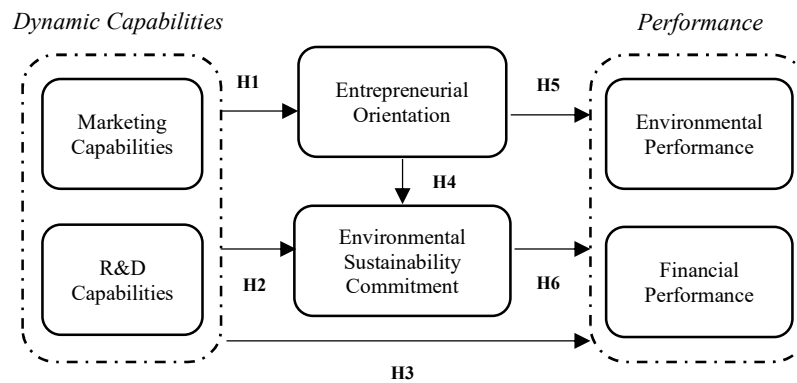


Figure 5.1 - Research Model

## 5.3. Methods

### 5.3.1. Sample characteristics

The entrepreneurial activity of farmers has profound impacts on environmental and financial performance, but those effects may be different across agricultural subsectors and regions. Despite fruit production has a lower environmental impact than other agricultural products, like vegetables and livestock products, it is considered an intensive agricultural system comprising the use of high levels of pesticides, fertilisers, equipment and financial capital when compared with other cropping systems (Cerutti et al., 2014). Thus, the study, in particular of the fresh fruit subsector in the Beira Interior region, where small farms are predominant, may bring new insights to the agricultural entrepreneurship literature.

Table 5.1 present the sample characteristics. The majority of farmers has environmental certifications, while almost the totality has fresh fruits as the primary income source.

Table 5.1 - Sample characteristics

<b>Variable</b>	<b>Category</b>	<b>N°</b>	<b>%</b>
Juridical status	Individual Producer	131	81.9
	Agricultural Society	29	18.1
Fresh fruits area	1-5 ha	49	30.6
	5-20 ha	65	40.6
	20 ha or more	46	28.8
Fresh fruits as the primary income source	Yes	150	93.8
	No	10	6.2
Environmental certifications	Yes	115	71.9
	No	45	28.1

### 5.3.2. Measures

This survey provided for the collection of responses about the items measuring the variables included in the research model: Dynamic Capabilities (DCs), Entrepreneurial Orientation (EO), Environmental Sustainability Commitment (ESC), and performance – Financial Performance (FP) and Environmental Performance (EP). All items apply a five-point Likert scale even while the original scale contains a different number of points to preserve coherence with the respondent. Response one conveys “strongly disagree” while five represents “strongly agree”, except for the items related to the DC construct in which the degree of the firm’s capabilities compared to the competition in the region ranges from 1 (“much weaker than the competition”) and 5 (“much stronger than the competition”).

The study applied the nine-item scale of Covin & Slevin (1989) to evaluate the organization’s EO through three dimensions: innovativeness, proactiveness and risk-taking (Rauch et al., 2009). By previous studies, this measured DCs through Marketing Capabilities (Ruiz-Ortega et al., 2018; Spanos & Lioukas, 2001; Wilden & Gudergan, 2015), including four items, and R&D Capabilities (Bendig et al., 2017; Danneels, 2008), with five items. We here adopted the ESC scale and its four items from the study of Roxas et al. (2017). We furthermore measured FP and EP by five and four items, respectively (Yu et al., 2017).

### 5.3.3. Analytical approach

Similar to previous studies about agricultural entrepreneurship (Gellynck et al., 2015; Khoshmaram, Shiri, Shinnar, & Savari, 2018), we applied structural equations modelling (SEM) to test the research model. SEM allows researchers to test models comprising multiple equations involving dependent relationships in which the same variable may be both a dependent variable and an independent variable (Hair et al., 2006). In particular, we made recourse to partial least squares SEM (PLS-SEM) following the research objective to explain the variance (predicting the constructs) in an approach appropriate to small sample sizes and

complex models, and making practically no assumptions about the underlying data (Hair et al., 2017).

The analytical procedures applied Smart-PLS software (version 3).

## **5.4. Results**

Applying SEM incorporated a two-step procedure, firstly assessing the measurement model through confirmatory factor analysis, followed by an analysis of the structural model (Hair et al., 2006). As PLS-SEM aims to maximize the explained variance ( $R^2$  value) of the endogenous latent variables, the assessment of the quality of the measurement and structural models comprises metrics related to the model's predictive capabilities (Hair et al., 2017).

### **5.4.1. Measurement model**

The evaluation of the measurement model encompasses Cronbach's alpha and composite reliability (CR) for the assessment of internal consistency reliability; individual indicator reliability and with average variance extracted (AVE) assessing the convergent validity; and the Fornell-Larcker criterion for assessing discriminant validity (Hair et al., 2017).

This confirms the reliability of the scales (Table 5.2) as the cut-off values for Cronbach's alpha (0.70), and CR (0.70) are duly exceeded (Hair et al., 2006). This also verified the convergent validity as, for all constructs, the indicator loadings are above 0.70, and the values of AVE are above 0.50, meaning that the construct explains more than 50% of its indicators' variance. The study verified discriminant validity, which measures whether a construct is distinct from other constructs, through the Fornell-Larcker criterion as the square root value of the AVE returned by each construct is greater than its highest correlation with any other construct (Table 5.3).

Table 5.2 - Evaluation of the measurement model

<b>Items</b>	<b>Indicator loading</b>	<b>α</b>	<b>CR</b>	<b>AVE</b>
<b>Entrepreneurial Orientation (EO)</b>				
EO1. My farm strongly emphasizes technological leadership and innovations	0.863	0.929	0.942	0.669
EO2. My farm has implemented several new product lines in the last five years	0.801			
EO3. My farm has implemented important shifts in product lines in the last five years	0.772			
EO4. My farm is generally the first to begin actions that the competitors follow	0.843			
EO5. My farm is very often the first to implement new products, new technologies, new production methods, etc.	0.878			
EO6. My farm generally has a very competitive and “undo-the-competitors” attitude, rather than a “live-and-let-live” posture <sup>a</sup>	-			
EO7. My farm is oriented to high-risk projects with the potential for very high profit	0.731			
EO8. Attending to the type of environment, audacious acts accomplish the farm’s purposes, and not minimum tactical modifications	0.818			
EO9. When decisions comprise uncertainty, my farm always has a bold attitude to optimize the chance of exploiting opportunities, rather than a cautious and “wait-and-see” posture.	0.825			
<b>Marketing Capabilities (MCs)</b>				
MC1. Market knowledge.	0.856	0.887	0.921	0.746
MC2. Control and access to market channels.	0.914			
MC3. Privileged contacts with clients.	0.866			
MC4. Fixed client base.	0.815			
<b>R&amp;D Capabilities (RDCs)</b>				
RD1. Define new kinds of farm facilities and operations	-	0.927	0.946	0.780
RD2. Learn about new technology	0.929			
RD3. Assess the viability of new technology.	0.940			
RD4. Recruit engineers for unfamiliar technical fields	0.735			
RD5. Identify auspicious new technology.	0.926			
RD6. Implement new kinds of production methods.	0.870			
<b>Environmental Sustainability Commitment (ESC)</b>				
ESC1. Business is related to environmental protection	0.936	0.928	0.954	0.874
ESC2. Environmental practices benefit business	0.951			
ESC3. More clients are gained by environmental protection	0.917			
ESC4. Pleased to do business in the community <sup>a</sup>	-			
<b>Environmental Performance (EP)</b>				
EP1. My farm has obtained relevant environmental certifications.	0.942	0.919	0.949	0.861
EP2. My farm has habitually reached obligatory goals on waste decrease, energy preservation and recycling	0.942			
EP3. With green practices, my farm has previously saved a lot of money, excluding the achievements related to waste decrease, energy preservation or recycling	-			
EP4. On average, the global environmental performance of my farm has improved in the last five years	0.899			
<b>Financial Performance (FP)</b>				
FP1. On average, my farm has increased its sales in the last five years	0.903	0.841	0.906	0.763
FP2. On average, the market share of my farm has increased in the past five years	0.924			
FP3. The product portfolio of my farm has improved in the past five years	0.786			
FP4. New product markets were reached by my farm in the past five years	-			
FP5. New geographical markets were reached by my farm in the past five years <sup>a</sup>	-			

<sup>a</sup>The item was deleted during the construct validity process

Table 5.3 - Discriminant validity

	EO	EP	ESC	FP	MC	RDC
EO	<b>0.818</b>					
EP	0.785	<b>0.928</b>				
ESC	0.701	0.803	<b>0.935</b>			
FP	0.762	0.687	0.666	<b>0.873</b>		
MC	0.679	0.603	0.582	0.567	<b>0.864</b>	
RDC	0.776	0.790	0.747	0.648	0.671	<b>0.883</b>

### 5.4.2. Structural model

The assessment of the structural model requires analyzing the model’s predictive capabilities and the associations prevailing among the constructs based on the significance of the path coefficients, the  $R^2$  values, the effect size ( $f^2$ ) and the predictive relevance ( $Q^2$ ) (Hair et al., 2017). As PLS-SEM does not assume normally distributed data, the approach deploys a nonparametric bootstrap procedure. In our study, 5000 bootstrap samples are drawn from the original sample, each of which contains the same number of observations as the original sample (160 bootstrap cases) (Hair et al., 2017).

This verified the  $R^2$  values for the endogenous constructs (Table 5.4), comprising Entrepreneurial Orientation (EO), Environmental Sustainability Commitment (ESC), Environmental Performance (EP) and Financial Performance (FP). The  $R^2$  values returned were substantial for EP (0.769), and moderate for EO (0.652), ESC (0.607) and FP (0.632), which demonstrates the model has a suitable level of predictive capacity (Hair et al., 2017; Henseler, Ringle, & Sinkovics, 2009). Applying the blindfolding procedure, this also observed that the  $Q^2$  values for all endogenous constructs are much larger than zero, which thus demonstrates the predictive relevance of the model.

Table 5.4 - Assessment of the model’s predictive power

Construct	$R^2$	$Q^2$
EO	0.652	0.421
ESC	0.607	0.514
EP	0.769	0.647
FP	0.632	0.449

Finally, we examined the significance of the path coefficients and the size of the effects (Table 5.5). Only the relationship between Dynamic Capabilities (DCs) and FP is not significant, and hence rejecting Hypothesis 3b. In turn, Hypotheses 2 and 3a receive partial support as only R&D Capabilities (RDC) generate a significant and positive effect, respectively on ESC and EP.

Conversely, the other hypotheses are duly confirmed per the positive associations returned between DCs and EO (Hypothesis 1), EO and ESC (Hypothesis 4), EO and Performance (Hypotheses 5a/5b), as well as ESC and Performance (Hypotheses 6a/6b). The effect size ( $f^2$ ) attained satisfactory levels for the significant paths, reporting values of above 0.02 (Acosta, Crespo, & Agudo, 2018; Henseler et al., 2009). Nevertheless, this further highlights how this effect is large for the path between RCD and EO (0.555) and medium for the paths between RDC and ESC (0.234), EO and EP (0.151), EO and FP (0.299), as well as ESC and EP (0.282).

Table 5.5 - Assessment of the structural model

Hypothesis	Relationship	Coefficient	t-value	f <sup>2</sup>	Decision
H1	MC-EO	0.286***	4.391	0.139	Supported
	RDC-EO	0.586***	9.668	0.555	
H2	MC-ESC	0.065	0.918	0.012	Partially
	RDC-ESC	0.488***	4.043	0.234	Supported
H3a	MC-EP	-0.022	0.230	0.013	Partially
	RDC-EP	0.269**	3.092	0.100	Supported
H3b	MC-FP	0.041	0.487	0.011	Not
	RDC-FP	-0.020	0.100	0.007	supported
H4	EO-ESC	0.278**	2.727	0.077	Supported
H5a	EO-EP	0.315***	4.236	0.151	Supported
H5b	EO-FP	0.574***	7.183	0.299	Supported
H6a	ESC-EP	0.393***	6.036	0.282	Supported
H6b	ESC-FP	0.257**	3.005	0.077	Supported

\*\* $p < 0.01$

\*\*\* $p < 0.001$

## 5.5. Discussion

In spite of previous studies having obtained different conclusions about the effect of EO on FP in the agricultural sector (Grande et al., 2011; Veidal & Flaten, 2014a), we here report that EO generates a significant and positive impact on FP. These differences may derive from the characteristics of the farms analyzed. Despite the two aforementioned studies being carried out in the same country (Norway), one study returned a negative effect through focusing on farms from different geographical locations and sectors (Veidal & Flaten, 2014a). In contrast, the other study encountered a positive impact on analyzing farm firms in one particular region (Grande et al., 2011). In comparison with these works, our study displays particularities as it focused on a single region and but one specific sector (fresh fruits). As the agricultural sector is not homogeneous (McElwee, 2008), the entrepreneurial behaviour of farmers should be analyzed in keeping with the differences not only between regions but also between subsectors.

In this sense, Gellynck et al. (2015) followed the same approach in studying the banana sector in a region of Ecuador before concluding that Innovative EO influences FP positively.

Even though the agricultural sector generates a greater impact on the environment than other industries, we demonstrate that EO produces a significant and positive influence on Environmental Sustainability Commitment (ESC) and EP, and mitigating this impact. Previous studies have reached similar conclusions but following their examination of green ventures or when applying a green entrepreneurial orientation scale to other sectors (Dickel, 2018; Jiang et al., 2018). Hence, EO has a positive influence on performance and represents one of the more important intangible assets that are especially hard to imitate by competitors (Kropp et al., 2006; Roxas et al., 2017).

ESC also returns a significant impact on EP and FP even while with a stronger effect on EP. Despite ESC firstly incurring negative impacts on farm productivity (Morris & James, 2017) and implying higher costs, the positive aspects overcome these costs over the long term (Roxas et al., 2017). Thus, our study correspondingly finds that farms are particularly able to achieve competitive advantage through raising their levels of environmental sustainability as proposed by the Natural Resource-Based-View (NRBV) (Hart, 1995).

In spite of the vast literature on the theoretical relationships between firm capabilities and EO, the empirical implementation of these connections in particular types of firms still needs a deeper understanding (S. L. Martin & Javalgi, 2016) as is the case with the agricultural sector. Our study demonstrates how Marketing Capabilities (MC) and R&D Capabilities (RDCs) generate significant positive effects on EO. MCs and RDCs enhance the development of new products and processes adapted to customer needs, including their environmental requirements, improving innovativeness, facilitating early market entry and fostering higher risk-taking (Ruiz-Ortega et al., 2013). Although the effect of RDCs on EO is greater than the effect of MCs (Ruiz-Ortega et al., 2013), we report here that MCs constitute a core capability that positively affects EO not only in high-technology and exporting sectors (Liu, Zhang-Zhang, & Ghauri, 2020; Ruiz-Ortega et al., 2013) but also in agriculture. Therefore, MCs and RDCs represent Dynamic Capabilities as they enable farms to restructure their existing resources and basic capabilities (Teece et al., 1997) to enhance their new value creation (Grande, 2011).

RDCs significantly influence ESC and EP and thereby suggesting that farmers strive to adapt to new environmental standards through the development of those capabilities. Previous studies state that RDCs enhance the implementation of more advanced environmental technologies, improving resource conservation efficiency and EP (Joo, Seo, & Min, 2018;

Pipatprapa, Huang, & Huang, 2016; Rahman, Aziz, & Hughes, 2020), but this relationship displays certain particularities in the agricultural sector. Over the last century, as this sector was revolutionized by extraordinary advances in engineering knowledge and market demands, agricultural businesses have required significant applications of high technology to obtain higher returns coupled with increasing reductions in their environmental impacts (Cavallo et al., 2014; Sassenrath et al., 2008). Furthermore, innovation occurs on farms of all sizes (Micheels & Nolan, 2016) even though the type of technology may differ depending on the farm size (Rogers, 2004).

Contrary to RDCs, farmer MCs do not generate significant effects on ESC and EP, although those effects do seem positive in the manufacturing sector (Yu & Ramanathan, 2016). Agricultural entrepreneurs seem to hold lower levels of marketing skills when compared to other entrepreneurs, probably due to strong regulations, especially environmental stipulations, and public support for agricultural activities (Dias et al., 2019b), which may limit the type of environmental strategies adopted. Hence, farmers do not approach environmental challenges as opportunities to leverage their MCs and differentiate their products environmentally from other farmers.

Several works come out in support of the positive impact of MCs (Alnawas & Farha, 2019; Hao & Song, 2016) and RDCs (Hao & Song, 2016; Hernandez-Perlines, Ribeiro-Soriano, & Rodriguez-Garcia, 2019) on FP but there are contexts, including the agricultural sector, where this effect remains insufficiently examined. Nevertheless, our study demonstrates that neither MCs nor RDCs interlink with FP. This may suggest that the RDC of small-scale farmers, similar to some SMEs, essentially focuses on developing new technological processes, and not products (Hervas-Oliver, Boronat-Moll, & Sempere-Ripoll, 2016), which requires more time for implementation and consequently with no immediate effect on FP (Gellynck et al., 2015). In addition, R&D strategies must consider other factors besides RDCs, such as the supplier structure. Complementary innovation technologies, for example, packaging and refrigeration, externally provided by Marketing and Packaging Units or other suppliers potentially limit FP (Dias et al., 2017; Gellynck et al., 2015).

In the same way, the marketing strategies of small farms must highlight not only MCs but also the diversification of market channels as the means of improving FP (Dias et al., 2017). The alternative food networks (AFN), such as direct sales and farmers' markets, may provide good means of achieving this goal as they cut down the number of intermediaries between producers and consumers (Tudisca, Trapani, Sgroi, et al., 2014).

## **5.6. Conclusions**

The bulk of the research findings on Entrepreneurial Orientation (EO) demonstrate their positive influence on Financial Performance (FP) (Jiang et al., 2018; Rauch et al., 2009; Roxas et al., 2017), although the role of EO in terms of both Environmental Performance (EP) and FP remains unclear. Furthermore, the link between EO and performance (Dias et al., 2019b) as well as the type and effect of Dynamic Capabilities (DCs) on performance in the agricultural sector has hitherto been broadly neglected by researchers (Grande, 2011; Grande et al., 2011). Hence, our study contributes to a better understanding of the mechanisms through which entrepreneurs enhance their financial and environmental performance in sectors with high environmental impacts such as agriculture.

Our study concludes that EO and Environmental Sustainability Commitment (ESC) positively influences EP and FP, in addition to EO generating a positive impact on ESC. Taking into consideration how agriculture faces continuous challenges from both the demand and the supply sides (Gellynck et al., 2015), success depends on firms effectively developing their tangible and intangible assets (Day & Wensley, 1988), which are valuable, unique and hard to copy (Barney, 1991, 2001) such as EO and ESC. Therefore, farms may obtain a competitive advantage by improving their environmental sustainability as proposed by the Natural Resource-Based-View (NRBV) (Hart, 1995).

Farmers are also developing appropriate DCs, in particular R&D Capabilities (RDCs), to reconfigure their existing resources for new purposes and increased performance standards. To mitigate the environmental consequences of traditional agriculture and to adapt to the demand for environmental products, there has been a rise in usage of non-conventional agricultural systems, for example, organic and integrated farming that come with complex rules (Tasca et al., 2017) and require RDCs. Hence, those sets of capabilities tend to focus on the ESC and EP (Vecchio, Rosa, Adinolfi, Bartoli, & Masi, 2020) but not on FP. DCs comprise processes and mechanisms that enable organizations to undertake changes, enhancing benefits from unique resources and entrepreneurial actions. However, some of the capacities making up Marketing Capabilities (MCs) remain challenging for farmers to develop (Grande, 2011).

The different Common Agricultural Policy reforms over recent decades have increased the pressures on farmers to become more competitive, essentially in Mediterranean countries such as Portugal (Giannakis & Bruggeman, 2015). Although national and European agricultural policies must continue to provide farmers with financial resources and environmental training to achieve environmental targets, those policies must also endow them with the capabilities

necessary to become successful agricultural entrepreneurs (Pindado & Sánchez, 2017), specifically MCs and RDCs. Entrepreneurship training projects, in particular, may play an important role in sustainable agricultural value chains, enabling farmers to approach food security as a market opportunity (Bonney et al., 2013) and not only as of the rules they have to follow.

### **5.7. Limitations and future lines of research**

This research has some limitations. As we deployed a quantitative approach, there is still the need for more qualitative or mixed studies to determine just which types of resources and capabilities of agricultural entrepreneurs play the most significant roles in achieving environmental and financial performance, as well as incorporating the perspective of other players operating in the agricultural sector in addition to farmers. Longitudinal studies might examine farms of different sizes, which hold different resources and capabilities, to analyze the associations between the types of environmental strategies followed and the types of innovations developed (product or process innovations).

As we focused on a specific sector in a single Portuguese region, the results are not susceptible to generalization to other contexts. Thus, the literature needs more studies about the links between natural resources, EO and performance in different regions, including dry areas, to see how producers enhance the natural resources of their region. Our study examines fresh fruit farms that, contrary to packaged food units, generally do not make recourse to brands and other innovative ways of differentiating their goods (Lewis et al., 2014). Further studies must analyze different sectors, including both fresh and packaged products, to identify the role of MCs in developing entrepreneurial opportunities, essentially those interrelated with environmental preservation. As the environmental impacts and the type of DCs also seem to differ between crop and livestock sectors (Bastanchury-López, De-Pablos-Heredero, Montes-Botella, Martín-Romo-Romero, & García, 2020), future studies should also take into account the relationships prevailing between EO, DCs and EP.

## **Chapter 6 - General Conclusions**

### **6.1. Final considerations**

Based on a regional and sectoral context approach, this thesis has as general objective the analysis of the entrepreneurial behaviour of owner-managers operating small agricultural businesses in an inland region. To attend this objective, four studies were developed, each with a specific objective.

In Chapter 2, it was conducted a Systematic Literature Review (SLR) based on bibliometric analysis, to address how the investigation in agricultural entrepreneurship is approached in different periods. In the period 1969-2012, two main themes emerged in the literature (“Entrepreneurial Skills and Income Sources” and “Market and Resources”) while, in the period 2013-2017, three main topics were highlighted (“Entrepreneurial Skills and Behaviour”, “Entrepreneurial Strategies” and “Community and Entrepreneurial Activity”). Based on several research gaps identified on the SLR, three empirical studies were developed.

The specific objective of Chapter 3 is to examine the influence of farm capital and age on new entrances and farm succession. Attending to a regional and sectoral context, the results suggest that younger farmers with previous entrepreneurial experience, running smaller farms but without beneficiating from CAP funding to start-up tend to be a new entrant. On the other hand, younger and higher educated farmers with their land but without previous entrepreneurial experience are likely to be a farm successor. Hence, this study suggests not only a rejuvenation of the agricultural sector in a country characterised by a higher proportion of older farmers (Giannakis & Bruggeman, 2015), but also that different levels of human capital influence different forms of entrepreneurial entry into the sector, as proposed by the human capital theory.

Chapter 4 pretends to categorize different profiles of farm diversification businesses, based on their conventional and unconventional nature, relating it with family portfolio entrepreneurship. Based on an original framework that operationalizes farm diversification in conventional and unconventional terms, the results allow identifying three classes of farmers: Pioneers, Traditionalists and Diversifiers. Pioneers promote family portfolio entrepreneurship and diversify to unconventional crops, animals and agricultural practices, Traditionalists opt for this type of diversification as well to marketing channels, although both in conventional terms; and Diversifiers are focused on the diversification of market channels and non-agricultural activities. Although inheritance was already identified as an important factor

determining self-employment among farmers (Skrzek-Lubasinska & Szaban, 2019), this study found that a farm household may comprise fathers and sons running independent farms which naturally are boosted by the sharing of resources. Moreover, farm-related firms are not only related to non-agricultural activities (Dias et al., 2019b) but also to the core business of the original farms.

The specific objective of Chapter 5 is to comprehend the influence of resources and capabilities of agricultural entrepreneurs on environmental and financial performance. The findings suggest that Entrepreneurial Orientation (EO) and Environmental Sustainability Commitment (ESC) positively impacts Environmental (EP) and Financial Performance (FP), in addition to EO originating a positive effect on ESC. As proposed by the Natural Resource-Based-View (NRBV) (Hart, 1995), small farms may attain a competitive advantage by improving their environmental sustainability based on resources that are valuable, unique and hard to copy (Barney, 1991, 2001). Adequate Dynamic Capabilities (DCs) have also been developed, namely R&D Capabilities (RDCs), to reconfigure the existing resources for new purposes, essentially the environmental ones. However, Marketing Capabilities (MCs) must be improved (Grande, 2011) to respond more creatively to the increasing demand for environmental products by the consumers.

Recently, the Portuguese government, supported by European Union institutions, has introduced the Innovation Agenda for Agriculture 2030 (MAFDR, 2020) for the period between 2021 and 2030. To develop the agricultural sector based on innovation, this strategic plan proposes the achievement of various goals, namely the attraction of more younger farmers to inland regions, the digital transition, the promotion of short supply chains and diversification to non-agricultural businesses, the improving of farms' financial and environmental sustainability, as well as increasing the investment on R&D. The role of higher education institutions and research institutes will be essential. However, it must have a multidisciplinary nature that includes not only people from agricultural and technology sciences but also from management and economics sciences. Hence, it will be possible to enhance agricultural entrepreneurship in inland regions, providing farmers with adequate entrepreneurial skills to face those challenges.

## **6.2. Implications**

This thesis has important implications for theory and practice, focusing on the entrepreneurial behaviour of small farmers in regions and subsectors limited by the lack of resources.

In Chapter 2, the Systematic Literature Review (SLR), based on a bibliometric analysis, shows the importance of applying bibliometric techniques on the identification of thematic areas on a research field. By dividing into different periods the literature about agricultural entrepreneurship, this SLR allows identifying not only which research topics are emphasised in each period but also different perspectives on the same topic in both periods. Considering sector as a fundamental context which influences many aspects of entrepreneurship (Fitz-koch et al., 2018), it is possible to analyse the specific entrepreneurial skills, strategies and resources associated to the agricultural sector.

In Chapter 3, the study allows understanding the entrepreneurial entry process in agriculture, through the analysis of the effects of farm capital and age on new entrances and farm succession. It allows comprehending how, in a country with a high share of older farmers and small farms (Giannakis & Bruggeman, 2015), younger people may be attracted to agriculture without Common Agricultural Policy (CAP) start-up support. Despite the importance of public financial measures related to the creation of new businesses (Brzozowski, Cucculelli, & Peruzzi, 2019; Fuentelsaz et al., 2019), this study shows that human and physical capital may be more important for agricultural entrances. It also demonstrates the importance of developing a more dynamic entrepreneurial perspective of human capital theory, examining the specific entrepreneurial outcomes of educational and training activities (B. C. Martin et al., 2013) like the forms of entrepreneurial entry (Estrin et al., 2016). The results suggest the elaboration of future public policies more efficient in attracting agricultural entrants, especially the younger ones and with stronger human capital.

The study included in chapter 4 provides an original framework that reflects the conventional and unconventional nature of farm diversification. It shows that the particularities of each region and agricultural subsector may influence farm diversification strategies. It also demonstrates the close relationship between farm diversification and family portfolio entrepreneurship, highlighting the importance of all familiar relations on the creation of farm-related firms as well the activities developed there. Farm diversification businesses may be understood as the first step of developing other firms (Carter, 1998a) owned by the farmer or other household members. However, those firms may be focused on the same activities as the original farm. Attending that farmers became more open to implementing new practices with training (Sutter et al., 2017), more technical support and training programmes on entrepreneurship, marketing and technology must be provided by local associations, universities and research institutes. Public institutions should continue to involve farmers in tourism events (Mshenga & Richardson, 2013), promoting the diversification of their sources of income.

In chapter 5, the last study allows understanding how entrepreneurs increase both financial and environmental performance on sectors with strong environmental impacts like agriculture. This study shows that small farms may obtain a competitive advantage by improving their environmental sustainability as proposed by the Natural Resource-Based-View (NRBV) (Hart, 1995), while Dynamic Capabilities (DCs), namely R&D Capabilities, may be more oriented to environmental performance than financial performance, due to the stronger environmental requirements of agricultural markets. Based on the results obtained, national and European agricultural policies must provide not only financial support but essentially training on environmental marketing to farmers, enabling them to explore all the opportunities offered by the increasing concerns of consumers with the environment.

### **6.3. Limitations and future research lines**

This thesis has some limitations that may provide avenues for future research. As it takes a quantitative approach, more qualitative and mixed studies must analyse the issues examined. Attending that it focuses on a particular sector of a particular region, the findings may not be generalised to other sectors or regions. Further studies must analyse different sectors, regions and countries to see the differences in the entrepreneurial behaviour of farmers. Future studies must also integrate the perspective of other players operating in the agricultural sector in addition to farmers.

In Chapter 2, as only articles included in the Scopus database are examined in the Systematic Literature Review (SLR), future reviews may comprise other databases like Web of Science and other types of documents as conference papers, books and book chapters. The analysis of other periods, as well as other search terms, may also bring other perspectives of the literature. This SLR provided future research lines that were explored in three empirical studies, although other lines may be followed in future investigations.

Chapter 3 presents some limitations. As only new entrants with ten years of experience or less were addressed, longitudinal studies should examine if and why new entrants as well as farm successors remain in the sector. Future studies must examine more deeply how other types of farm capital are associated with the agricultural entrances process. However, the Common Agricultural Policy (CAP) support to start-up to young farmers (Balezentis et al., 2020; Bertolozzi-Caredio et al., 2020), especially the obstacles that farmers face to obtain the support, still requires attention by researchers. These studies may help in the design of future public support measures to young farmers since younger people tend to be more engaged in ambitious entrepreneurship (Giotopoulos et al., 2016). Further studies should also examine

how the level of social capital of agricultural entrants may be improved, namely through their participation in Producer Organisations (Kontogeorgos et al., 2017).

In Chapter 4, as the conventional or unconventional nature of farm diversification was self-reported, future studies could define quantitative measures considering that it can be time and geographical-dependent of mainstream farming (Barnes et al., 2015). More studies are needed about family portfolio entrepreneurship, covering not only one household but also the familiar relations between various farm households (Estrada-Robles et al., 2020). As the creation of new ventures outside conventional farm businesses involves a more entrepreneurial approach (Hansson et al., 2013), more research is needed about the association between marketing channels, food labels and non-agricultural activities, attending to their conventional or unconventional nature. Although the comparison between portfolio and serial entrepreneurs has received considerable attention by management researchers, the analysis of this issue in the agricultural sector may bring new insights to the entrepreneurship literature.

Chapter 5 calls for more studies to determine other types of resources and capabilities of agricultural entrepreneurs that may improve environmental and financial performance. Longitudinal studies are also required and could include farms of different sizes, examining the relationships between environmental strategies and the types of innovations developed (product or process innovations). Further studies must focus on how entrepreneurs enhance natural resources to improve performance, attending to the heterogeneity of natural conditions existing in different areas, including the dry ones. Further studies must analyze more deeply the links between Entrepreneurial Orientation, Dynamic Capabilities, especially Marketing Capabilities, and Environmental Performance, considering the different requirements between fresh and packaged products (Lewis et al., 2014), and between crop and livestock products (Bastanchury-López et al., 2020).

Despite the increased interest of entrepreneurship researchers on context (Kim, Moon, Kim, Koh, & Shin, 2019), there are central contexts that still do not capture sufficient attention from researchers as the agricultural sector (Fitz-koch et al., 2018). In a time where a severe pandemic affects the world, agriculture is one of the sectors than cannot stop since it is inescapable to the survival of humanity. Hence, our study calls for more works that allow comprehending the specificities of the sector in promoting entrepreneurship, especially after the recent pandemic.

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# **Appendix**

## **Questionnaire**

**QUESTIONÁRIO Nº \_\_\_\_\_**

Este inquérito é realizado no âmbito do 3º Ciclo em Gestão na UBI. Toda a informação recolhida é confidencial.

**REQUISITOS**

- A. Ser proprietário/gestor de uma exploração de frutos frescos na Beira Interior
- B. A área mínima de frutos frescos deve ser 10.000 m<sup>2</sup> (1 hectare)
- C. Os frutos frescos produzidos devem ser principalmente para comercialização

**1-Capacidades de Marketing**

-Indique as capacidades da sua exploração relativamente aos concorrentes na região desde 1 (Muito mais fracas que os concorrentes) até 5 (Muito mais fortes que os concorrentes):

Items	1	2	3	4	5
1.1-Conhecimento do mercado					
1.2-Controlo e acesso a canais de distribuição (ex: hipermercados, mercearias)					
1.3-Relações privilegiadas com clientes					
1.4-Reter uma base estável de clientes					

**2-Capacidades de I&D**

-Indique as capacidades da sua exploração relativamente aos concorrentes na região desde 1 (Muito mais fracas que os concorrentes) até 5 (Muito mais fortes que os concorrentes):

Items	1	2	3	4	5
2.1-Definir novos tipos de instalações agrícolas e operações (ex: seleção, embalamento e armazenamento de produtos)					
2.2-Aprender sobre tecnologia que ainda não foi utilizada					
2.3-Avaliar a viabilidade de novas tecnologias					
2.4-Recrutar engenheiros em áreas técnicas em que não estão familiarizados					
2.5-Identificar novas tecnologias promissoras					
2.6-Implementar novos tipos de processos de produção					

### **3-Orientação Empreendedora**

-Indique o nível de concordância desde 1 (Discordo fortemente) até 5 (Concordo fortemente)

<b>Items</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
3.1-A minha exploração agrícola valoriza significativamente as inovações e a liderança tecnológica					
3.2-Nos últimos 5 anos, a minha exploração lançou muitas novas linhas de produtos (ex: novas culturas, cultivares, produtos transformados)					
3.3-Nos últimos 5 anos, as mudanças nas linhas de produtos foram em geral muito significativas (ex: embalagem, design)					
3.4-A minha exploração é geralmente a primeira a iniciar ações a que os concorrentes respondem (ex: primeira a entrar em novos mercados)					
3.5-A minha exploração é geralmente a primeira a introduzir novos produtos, novas tecnologias, novos métodos de produção, etc.					
3.6-A minha exploração procura ativamente que os seus concorrentes saiam do mercado, em vez de tentar evitar guerras com os concorrentes					
3.7-Em geral, a minha exploração tem uma forte preferência por projetos de elevado risco (com possibilidade de rentabilidades muito elevadas mas incertas)					
3.8-Tendo em conta a natureza do meio envolvente, a exploração necessita de ações arrojadas e de grande impacto para alcançar os seus objetivos, em vez de mudanças táticas menores					
3.9-Quando a minha exploração é confrontada com decisões que envolvam incerteza, adota sempre uma postura arrojada para maximizar a probabilidade de explorar oportunidades, em vez de adotar uma postura cautelosa de “esperar para ver”					

#### 4-Compromisso para a Sustentabilidade Ambiental

-Indique o nível de concordância desde 1 (Discordo fortemente) até 5 (Concordo fortemente)

Itens	1	2	3	4	5
4.1-A proteção ambiental faz parte do negócio					
4.2-As práticas ambientais são boas para o meu negócio					
4.3-Ganho mais clientes com a proteção ambiental					
4.4-Tenho orgulho em fazer negócio na comunidade local					

#### 5-Desempenho Ambiental

-Indique o nível de concordância desde 1 (Discordo fortemente) até 5 (Concordo fortemente)

Itens	1	2	3	4	5
5.1-A minha exploração atingiu importantes certificações relativas ao ambiente (Ex: Produção Biológica, Produção Integrada)					
5.2-A minha exploração atingiu regularmente metas impostas sobre conservação de energia, reciclagem ou redução de desperdícios					
5.3-Devido a práticas amigas do ambiente, a minha exploração tem poupado um montante significativo de dinheiro, não incluindo as metas em termos de conservação de energia, reciclagem ou redução de desperdícios (ex: conservação de água, reutilização de materiais e desperdícios)					
5.4-Em média, o desempenho ambiental global da minha exploração melhorou nos últimos 5 anos					

#### 6-Desempenho Financeiro

-Indique o nível de concordância desde 1 (Discordo fortemente) até 5 (Concordo fortemente)

Itens	1	2	3	4	5
6.1-Em média, as vendas da minha exploração têm crescido nos últimos 5 anos					
6.2-Em média, a minha exploração melhorou a sua quota de mercado nos últimos 5 anos					
6.3-A minha exploração aumentou o seu portfolio de produtos nos últimos 5 anos					
6.4-A minha exploração atingiu novos mercados de produtos nos últimos 5 anos					
6.5-A minha exploração atingiu novos mercados geográficos nos últimos 5 anos					

## 7-Caraterísticas da exploração agrícola

### 7.1-Natureza jurídica da exploração agrícola

1-Produtor singular \_\_\_

2-Sociedade \_\_\_

3-Outra \_\_\_\_\_

### 7.2-Contrata trabalhadores permanentes?

0-Não \_\_\_

1-Sim \_\_\_ Se Sim, indique N° total \_\_\_

### 7.3-A forma de exploração da terra é exclusiva ou principalmente própria?

0-Não \_\_\_

1-Sim \_\_\_

### 7.4-Área total (inclui floresta), Superfície Agrícola Utilizada (SAU) e Área de frutos frescos:

	ha	Área total	SAU	Área de Frutos Frescos
<b>Total</b>				
<b>Classes</b>	1) 1 a 5 ha			
	2) 5 a 20 ha			
	3) 20 ha ou mais			

### 7.5-Área de frutos frescos, por espécie:

Espécie	ha
Ameixa	
Cereja	
Damasco	
Diospiro	
Figo	
Ginja	
Maçã	
Marmelo	
Pera	
Pêssego	
Outros frutos frescos _____	

### 7.6-Produz mais que uma espécie de frutos frescos (ex: cereja, pêssego)?

0-Não \_\_\_

1-Sim \_\_\_

7.7-Além de frutos frescos, tem outras atividades lucrativas (sem outra empresa constituída)?

0-Não \_\_\_

1-Sim \_\_\_ Se Sim, indique:

Atividades	Produtos	0-Não	1-Sim
<b>Agrícolas</b>	Outras culturas, além de frutos frescos		
	Produção animal		
<b>Não Agrícolas</b>	Compra e venda de frutos frescos (Embalamento)		
	Produção florestal		
	Transformação de produtos agrícolas alimentares (ex. compotas)		
	Artesanato e transformação de produtos agrícolas não alimentares		
	Turismo rural		
	Produção de energias renováveis		
	Prestação de serviços (ex: aluguer de equipamentos a terceiros)		
	Outras _____		

7.8-Qual é a principal fonte de rendimento da exploração?

1-Frutos frescos \_\_\_

2-Outras culturas, além de frutos frescos \_\_\_

3-Produção animal \_\_\_

4-Atividades não-agrícolas \_\_\_

7.9-Utiliza circuitos comerciais diretos ao consumidor?

0-Não \_\_\_

1-Sim \_\_\_ Se Sim, indique:

Circuito direto	0-Não	1-Sim
Vendas diretas na exploração		
Colheita direta no campo pelo cliente		
Loja na exploração		
Comércio eletrónico (ex: site, Facebook)		
Mercados agrícolas (ex: Praça)		
Eventos na exploração (ex: casamentos)		
Eventos fora da exploração (ex: Feira da cereja)		
Vendas à beira da estrada		
Vendas porta-a-porta		
Vendas em transporte itinerante		
Outro _____		

7.10-Utiliza circuitos comerciais indiretos?

0-Não \_\_\_

1-Sim \_\_\_ Se Sim, indique:

<b>Circuito indireto</b>	<b>0-Não</b>	<b>1-Sim</b>
Organização Produtores		
Unidade embalagem privada		
Mercados abastecedores		
Pequeno retalho		
Grande retalho		
Hotéis, restaurantes, cafetarias		
Indústria		
Exportação		
Outro _____		

7.11-Tipos de mercados geográficos:

<b>Mercado geográfico</b>	<b>0-Não</b>	<b>1-Sim</b>
Mercado regional		
Mercado nacional (além do regional)		
Mercado internacional		

7.11.1-Qual o principal tipo de mercados geográficos?

1-Regional \_\_\_

2-Nacional \_\_\_

3-Internacional \_\_\_

7.11.2-Implementou algum esquema de certificação agrícola na exploração?

0-Não \_\_\_

1-Sim \_\_\_ Se Sim, indique quais:

<b>Esquema de certificação</b>	<b>0-Não</b>	<b>1-Sim</b>
Produção Biológica		
Produção Integrada		
GlobalGAP		
Outro _____		

7.12-Comparando com o padrão da região, indique se o rendimento da exploração provém de atividades tradicionais ou não-tradicionais:

Atividade	Tipo de atividade	0-Não	1-Sim
<b>Tradicional</b>	Além de frutos frescos, o rendimento provém de outra cultura ou animal tradicional?		
	Utiliza dois ou mais circuitos comerciais tradicionais (diretos ou indiretos)?		
	O rendimento provém de atividades não-agrícolas tradicionais?		
<b>Não tradicional</b>	Tem culturas, animais ou práticas culturais não-tradicionais (ex: agricultura biológica)?		
	Utiliza circuitos comerciais não-tradicionais?		
	Tem atividades não-agrícolas que sejam não-tradicionais?		

7.13-Apoio financeiro comunitário - PAC (Política Agrícola Comum)

Tipo de apoio	0-Não	1-Sim
PU (Pedido Único)		
Medidas Agro-Ambientais - Produção Biológica e Integrada		
Instalação da exploração (Projeto de Jovem Agricultor)		

## 8-Caraterísticas do proprietário/gestor

8.1-Género

0-Masculino \_\_\_

1-Feminino \_\_\_

8.2-Idade (anos) \_\_\_\_\_

1-Menos de 35 \_\_\_

2-35-44 \_\_\_

3-45-54 \_\_\_

4-55-64 \_\_\_

5-65 ou mais \_\_\_

8.3-Educação (nível de escolaridade mais elevado que completou)

- 1-Sem estudos \_\_\_
- 2-4º ano \_\_\_
- 3-6º ano \_\_\_
- 4-9º ano \_\_\_
- 5-12º ano \_\_\_
- 6-Bacharelato \_\_\_
- 7-Licenciatura \_\_\_
- 8-Mestrado \_\_\_
- 9-Doutoramento \_\_\_

8.4-Tem formação a nível superior?

- 0-Não \_\_\_
- 1-Sim \_\_\_ Se Sim, indique a área: \_\_\_\_\_

Área de educação	0-Não	1-Sim
Agricultura		
Artes e Humanidades		
Ciências, matemática e informática		
Ciências sociais, Comércio e Direito		
	Ciências empresariais	
	Outras Ciências sociais e Direito	
Educação		
Engenharia, indústrias transformadoras e construção		
Saúde e Proteção social		
Outra _____		

8.5-Condição perante o trabalho

- 1-Empregado \_\_\_
- 2-Desempregado \_\_\_
- 3-Reformado \_\_\_
- 4-Outro \_\_\_\_\_

8.5.1- Se Empregado, indique:

Empregado	0-Não	1-Sim
Na exploração ou empresas relacionadas		
Fora da exploração		

8.6-Nº anos de experiência como proprietário/gestor da exploração agrícola \_\_\_\_\_

0-Mais de 10 anos \_\_\_\_

1-10 anos ou menos \_\_\_\_ Indique o nível de concordância desde 1 (Discordo fortemente) até 5 (Concordo fortemente) com os motivos pelos quais iniciou um negócio agrícola:

Motivos	1	2	3	4	5
Obter lucro					
Aceder a financiamento da PAC (Política Agrícola Comum)					
Aumentar o prestígio e status social					
Para satisfação e realização pessoal					
Ser independente					
Mudar o estilo de vida					
Promover a sustentabilidade ambiental					
Contribuir para o bem-estar da sociedade/comunidade					
Manter o negócio da família					
Ser inovador					
Educar os consumidores acerca da agricultura e alimentação					

8.7-Entrou no setor agrícola por sucessão familiar?

0-Não \_\_\_\_

1-Sim \_\_\_\_

8.8-Antes da entrada no setor agrícola, foi proprietário/gestor de negócios?

0-Não \_\_\_\_

1-Sim \_\_\_\_

8.9-Tipo de associações de produtores de que é membro:

Tipo de associação	0-Não	1-Sim
Associação de agricultores		
Associação de regantes		
Outra _____		_____

8.10-É proprietário/gestor de outras empresas que utilizem recursos da exploração?

0-Não \_\_\_

1-Sim \_\_\_ Se Sim, indique:

Atividades	Tipo de produtos	0-Não	1-Sim
<b>Agrícolas</b>	Frutos frescos		
	Outras culturas, além de frutos frescos		
	Produção animal		
<b>Não Agrícolas</b>	Embalamento de frutos frescos		
	Produção florestal		
	Transformação de produtos agrícolas alimentares		
	Artesanato e transformação de produtos agrícolas não alimentares		
	Turismo rural		
	Prestação de serviços (ex: aluguer de equipamentos a terceiros)		
	Produção de energias renováveis		
	Outras _____		

### 9-Caraterísticas do agregado familiar

9.1-As atividades desenvolvidas na exploração ou empresas relacionadas são a principal fonte de rendimento do agregado?

0-Não \_\_\_

1-Sim \_\_\_

9.2-Nº total de membros do agregado familiar \_\_\_

9.3-Algum membro do agregado é trabalhador permanente na exploração ou empresas relacionadas do entrevistado?

0-Não \_\_\_

1-Sim \_\_\_

9.4-Algum membro do agregado trabalha fora da exploração ou empresas relacionadas?

0-Não \_\_\_

1-Sim \_\_\_

9.5-Algum membro é proprietário/gestor de empresas que utilizem recursos da exploração?

0-Não \_\_\_

1-Sim \_\_\_ Se Sim, indique:

9.5.1-Tipos de membros:

Tipo de membro	0-Não	1-Sim
Cônjuge		
Filhos		
Pais		
Irmãos		
Outro _____		

9.5.2-Tipos de empresas:

Atividades	Tipo de produtos	0-Não	1-Sim
<b>Agrícolas</b>	Frutos frescos		
	Outras culturas, além de frutos frescos		
	Produção animal		
<b>Não Agrícolas</b>	Embalamento de frutos frescos		
	Produção florestal		
	Transformação de produtos agrícolas alimentares		
	Artesanato e transformação de produtos agrícolas não alimentares		
	Turismo rural		
	Prestação de serviços		
	Produção de energias renováveis		
	Outras _____		

Nome _____
Designação da exploração _____
Freguesia/Município _____
Telefone (facultativo) _____
E-mail (facultativo) _____
Data _____