

Research Article

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When does Innovation Become Custom? A Case Study of the Montado, Southern Portugal

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Abstract: In theory, if a new idea offers a good solution for a current problem and is properly widespread, then there is an ongoing brokering process, and, at a certain moment in time, an innovation is no longer considered as such. In the present study, we examine the case of the Montado, an agro-silvo-pastoral system in southern Portugal, to reflect on when and how innovations become custom. Integrating data from 2013 and 2017, we identified innovative initiatives that, if expanded, could reverse the current decline of the Montado system. We categorized the identified innovations as 1) social and institutional, 2) regulations and policies, 3) products and markets, and 4) farming techniques and management practices. Innovation is deemed necessary for the preservation of the Montado, yet initiatives that have existed for over 20 years are still considered innovative and an exception to the rule. At least since 2013, innovation-brokering processes have been attempted, leading us to question why these innovations are not becoming custom. By examining categories of innovations, we suggest that for innovations to become custom, changes in social and institutional arrangements need to be reinforced by regulations and policies that support changes in products and markets as well as by the adoption of new farming techniques and management practices. We conclude by suggesting a research agenda that starts aligning the evolution of the Montado system with the desired future as soon as possible.

Keywords: innovation, transition, visions, agro-silvo-pastoral systems, Montado

1 Introduction

Transitioning to sustainable agriculture has been at the top of the policy and scientific agenda for some time (Sutherland et al. 2015; Šūmane et al. 2018). However, although several policy drivers have been put in place to promote such a transition, present efforts lack effectiveness, and farming is still unable to provide all the public goods and functions desired by citizens (Dramstad and Fjellstad 2011; Wolff et al. 2015). Therefore, there is a need to assess transition processes so that best practices can be identified, characterized, and used by others to meet the urgent need for change. One effort being made with respect to this issue is the promotion of innovation-brokering processes (Beaufoy 2017). In an innovation-brokering process, conditions are put in place so that new ideas can be developed and implemented (*Oslo Manual* 2005; Madureira et al. 2013; Wolff et al. 2015). This means that if a new idea, device, or method of dealing with problems is successful and becomes sufficiently widespread, other individuals, organisations, and businesses, at a certain point in time, will also make use of them. If an innovation starts being used by many, then such an innovation stops being the exception and becomes custom. The process of innovation is defined by the Oslo Convention (*Oslo Manual* 2005) as the introduction/implementation of a product (good or service), process, organisation form, or marketing method that is new or significantly improved. The process of innovation is multidimensional and often difficult to identify and measure (Madureira et al. 2013).

Theoretical developments around transition and innovation are increasing, and a similar increase is seen with empirical experiments that try to put into practice the elements described as necessary to enable transitions and incorporate innovations (Knickel et al. 2009; Sutherland et al. 2015; Bjørkhaug and Knickel 2018). In the agriculture sector, elements such as farmers' and rural entrepreneurs' knowledge, motivations, and values are considered important in innovation processes (Knickel et al. 2009). The importance of learning and of the integration of knowledge, both formal and informal,

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through an innovation-brokering process are being increasingly recognized (Šumane et al. 2018). Therefore, the current discourse regarding theories of transition and innovation emphasize the social aspects of innovation and the importance of knowledge integration and of learning.

In this paper, we look at results from three different research projects, namely, FarmPath, HNV-Link, and Tertúlias do Montado, in which innovation initiatives were identified. Our analysis is based on data collected at a case-study level. Our case study focuses on the sustainability of the most emblematic landscape of the Alentejo region in Portugal—the agro-silvo-pastoral system designated ‘the Montado’. Our reflection on the outcomes of these three projects framed within a timeline and within a categorization of the identified innovations enabled a qualitative analysis to be conducted that challenges the importance given to innovation-brokering processes. Our goal is to assess when and how innovations become sufficiently widespread that they turn into custom. We suggest that knowledge dissemination is not on its own sufficient to impel changes and the incorporation of new ways of doing things. On the basis of the achieved results, we propose a future research agenda regarding pathways towards securing the sustainability of the Montado as a multifunctional and High Nature Value (HNV) farming system. The paper provides a snapshot of the theoretical background of the transitions to sustainable agriculture, provides the context of the Montado case study and the analytical approach used, and presents a discussion of the results leading to the major findings.

2 Understanding transitions towards sustainable agriculture

Transition studies conceptualise societal systems as complex adaptive systems (Rotmans and Loorbach 2009; de Haan and Rotmans 2011). These are open systems, that is, they interact with their environment, and the rules governing the interactions between components are adaptive, that is, they change over time. A complex adaptive system therefore constantly changes and unfolds over time rather than stabilising in equilibrium. The interaction between societal subsystems affects the dynamics of the overall societal system. Indeed, as economic, cultural, technological, ecological, and institutional subsystems interact, they respond to changes in each other and adapt accordingly. Understanding transition thus means that the structures, cultures, and practices of a societal system are analysed in an integrative manner (de Haan and Rotmans 2011). The structures include, for example,

the formal, physical, legal, and economic features that enable or restrict practices. The cultures include the cognitive, discursive, and ideological issues involved in sense-making. The practices include the routines, habits, and procedures by which actors (individuals and/or organisations) maintain the functioning of the societal system. A socio-technical transition involves the development of technical innovations (by scientists or entrepreneurs), their organisation (manufacturing and financing), their use (selection and adoption), and the broader societal embedding (regulations, markets, infrastructures, and cultural symbols). A multi-phase conceptualisation of an innovation (Figure 1) describes a transition in time as a sequence of four phases (Rotmans and Loorbach 2010). First, there is a pre-development phase, where niches develop, but the changes are not visible. During the take-off phase, the process of structural change picks up momentum. This leads to the acceleration phase, in which structural changes become visible. Finally, a stabilisation phase occurs, where the new regime becomes established.

Transition studies have generally focused on the processes of radical change at national or even international level (Sutherland et al. 2015). Such studies are normally historical, as they require retrospectivity. However, the present paper focuses on transitions in farming and on emerging transitions (i.e., transitions in-the-making as described in (Sutherland et al. 2015)). Sutherland et al. (2015) describe the findings obtained during an analysis of seven European case studies, including the Montado. In the framework used by Sutherland et al. (2015), emerging transitions were defined as established niches that have engaged with actors and organisational structures at the regime level in a significant way (Darnhofer 2015). This means that these niches should be sufficiently stable (e.g., having well-defined rules and standards as well as established networks, amongst others) and should affect and modify the existing regime. To understand if such a change is occurring, Sutherland et al. (2015) analysed niches in the different case studies to examine whether these niches were affecting the farming sector as a whole or the value chain or the territory. Furthermore, niches were discussed considering their capacity to create a new alignment of actors, networks, or regimes, and whether the rules and values were clearly distinct from those of the regime. Finally, a niche should be addressing a sustainability issue that has been clearly defined by the actors involved in the emerging transition (Darnhofer 2015). In 2013, during the FarmPath project, niches in the Montado case study were identified. The results obtained in that study are presented below. However, a

conclusion expressed in Sutherland et al. (Sutherland et al. 2015) was that in several of the case studies, including the Montado, it was not clear whether the niches had stabilised and were promoting an emergent transition. Figure 1 provides a visual representation of the process of change as conceptualised by transition theory, including the concept of niches and their break-through over time.

Innovation theory emerges from another school of thought that seeks to explain how, why, and at what rate new ideas and technology spread. For the purpose of this paper, innovation theory provides a complementary perspective of how transitions occur through a description of the innovation-spreading process. The innovation-spreading process is linked to the innovation-brokering process (Beaufoy 2017), as the focus is on how an innovation is incorporated and starts becoming custom. Rogers (Rogers 2003) argues that the diffusion of innovations is the process by which an innovation is communicated over time among the participants of the social system. Four main factors influence the spread of a new idea: the innovation itself, communication channels, time, and the characteristics of the social system (Rogers 2003). The innovation must be widely adopted to become self-sustaining. As the process of adoption proceeds, there is a point at which an innovation reaches critical mass (i.e., it becomes custom). After the innovation is developed by the innovator, the adopters of the innovation can be categorized as early adopters, early

majority, late majority, and laggards. Innovation diffusion manifests itself in different ways and is highly dependent on the types of adopter and on the decision-making process surrounding adoption. The HNV-Link project, for which we present results here, was inspired by innovation theory. The HNV-Link methodological approach included the collection of innovations from grassroots efforts within 10 different HNV case studies around Europe and their wide dissemination across Europe. Dissemination was complemented by the identification and promotion of well-informed and motivated ‘animateurs’ who, working locally with HNV farmers, could contribute to the incorporation of HNV innovations. Therefore, the overall premise of the project was that a lack of information and proper orientation together with a weak social network support were the main reasons for the lack of an effective innovation-spreading process.

The role of agriculture is changing with societal expectations, and there is a growing recognition of the need for multifunctionality in agriculture and rural areas, leading to an increase in the number of innovation studies in those sectors (Knickel et al. 2009; Maderson and Wynne-Jones 2016; Coolsaet 2016; Šumane et al. 2018). Besides transition theory and innovation theory, another approach to understanding sustainable transitions is the innovation systems framework (Truffer and Coenen 2012). This framework adopts a systemic perspective, considering the collective of actors and institutions involved in the

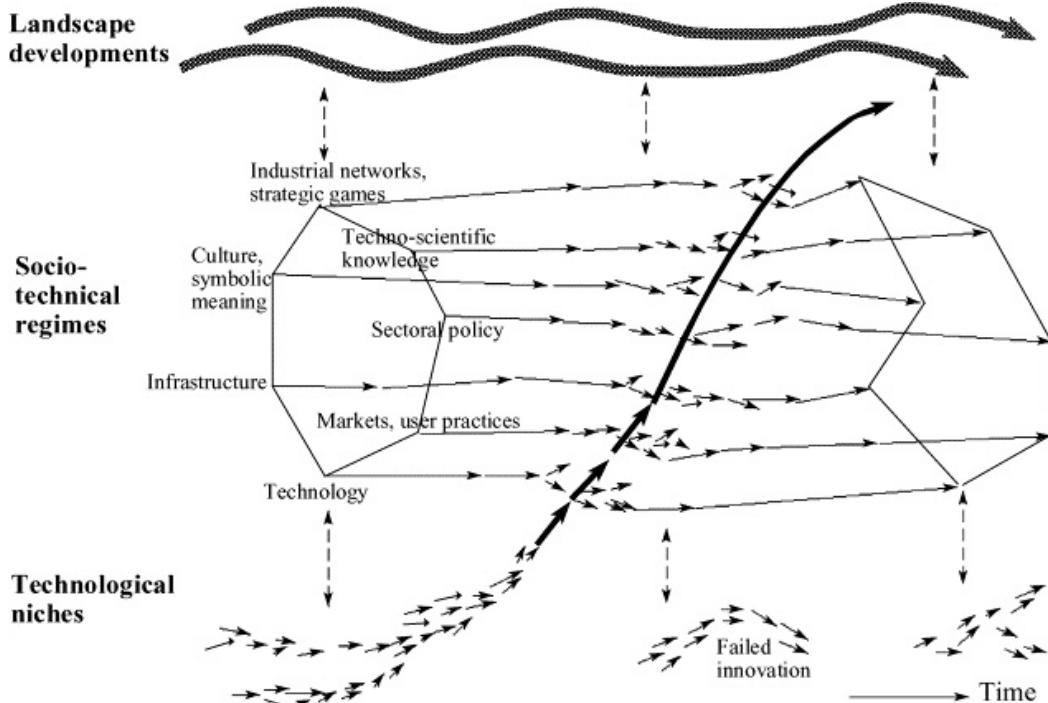


Figure 1: A multi-level perspective of the development and break-through of a niche innovation over time (source: (Geels et al. 2004))

innovation process organised in a multidimensional system, as well as their interactions (Schlaile et al. 2017). The innovation systems (IS) framework has been used successfully when aiming to understand strengths and weaknesses in the diffusion of innovations (Jacobsson and Bergek 2011; Truffer and Coenen 2012). For instance Knickel et al. (2009) found that to increase multifunctionality, farmers and rural entrepreneurs need support to achieve the associated adjustments. As farmers are linked to the market, they tend to develop demand-driven innovations. Therefore, a key challenge for innovation systems is to support improvements in the processing, marketing, and value-adding capacity of agriculture and forestry, as well as the exploitation of new opportunities related to the production and value of ecosystem services (Knickel et al. 2009). The institutions that should be supporting these changes were described as being too slow to react and to incorporate changes within their own structures, therefore rendering them incapable of supporting the adoption of innovation (Knickel et al. 2009). Thus, those institutions become a limiting factor in the innovation process. More research is needed regarding the institutional arrangements and factors that support or hinder the diffusion and adoption of innovations. Šūmane et al. (2018) focused mostly on knowledge production and integration and concluded that although cooperation among various knowledge actors and joint knowledge generation is expanding, there is limited structural support for such initiatives. Knowledge hierarchies still

give preference to scientific evidence and tend to exclude or ignore farmers' grassroots knowledge, in particular, that related to 'alternative' agricultural practices (Maderson and Wynne-Jones 2016; Coolsaet 2016).

By viewing the Montado case through the lens of transition theory and innovation theory at different moments in time (FarmPath in 2013 and HNV-Link in 2017), we were able to engage in a reflection, discussed in this paper, regarding the limitations of innovation-brokering processes. Through the analytical approach presented in the following section, we developed a critical reflection regarding the brokering process that has been promoted since 2013. While discussing the results presented in this paper, we return to transition theory and innovation theory to understand whether our empirical data support the conceptualisation of change that both theories describe. Within this discussion, the IS framework also contributes by offering a systemic perspective on the reasons why innovation-brokering processes have not yet induced the changes considered as required in the Montado land-use system, as revealed in the case study presented below.

3 Case study and analytical approach

The analytical approach used in this paper combines the analysis of qualitative data collected from three projects focused on farming transitions (FarmPath, an

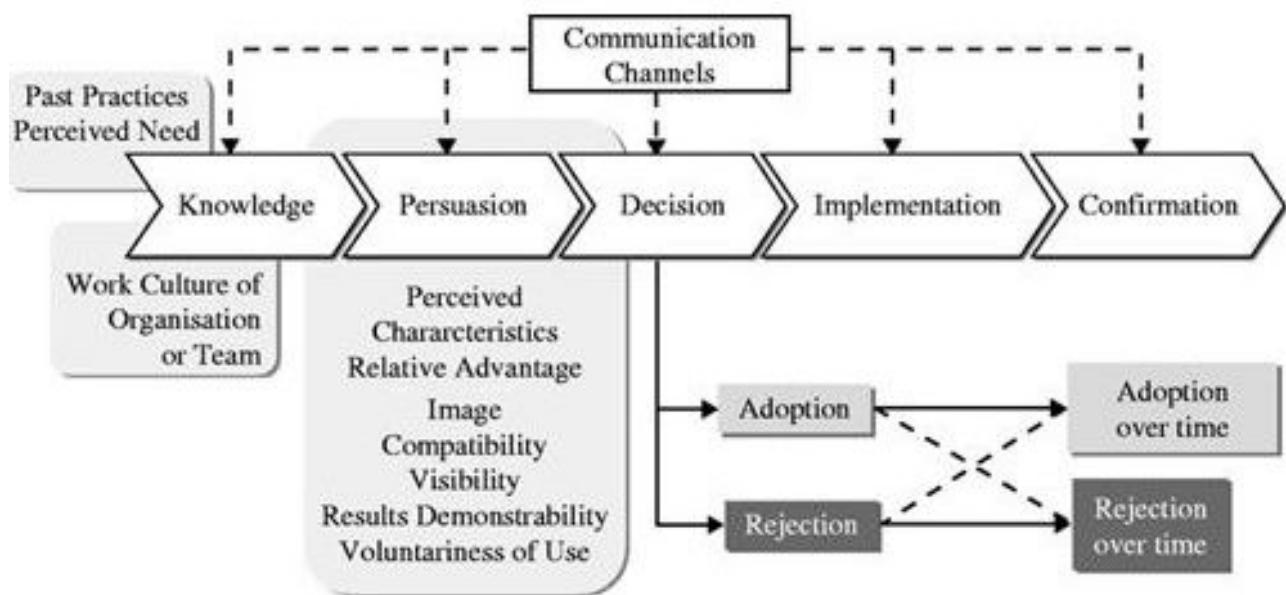


Figure 2: A model of the stages in the innovation-decision-making process. 'The innovation-decision process is the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to forming an attitude towards the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision' (source: (Rogers 2003))

FP7 EU-funded project), knowledge sharing and the dissemination of innovation in HNV farming (HNV-link, an H2020 EU-funded project), and the co-construction of knowledge (Tertúlias do Montado, a local initiative). All three projects were case study driven and used different scales of analysis. In the present study, we focus on the data collected in these projects regarding the Montado farming system in the Alentejo region, Portugal.

3.1 The Montado system and its desired futures

The Montado is an agro-silvo-pastoral land-use system that can be considered as an HNV farming system because its traditional multifunctional management is characterized by low intensity and a high level of biodiversity (Pinto-Correia and Carvalho-Ribeiro 2012). This system covers 46% of mainland Portugal and constitutes the majority of the land area in the region of Alentejo (Figure 3; (Godinho et al. 2016)). Despite the large coverage of the Montado, its

existence as an agro-silvo-pastoral system is under threat owing to the trends of intensification or abandonment. Godinho et al. (2016) provide an assessment of the current regime that is influencing the status of the Montado system by highlighting the influence of disruptive management actions (e.g., soil mobilisation) and the effects of the European common agricultural policy, both of which have strongly influenced the decline in the density and coverage of the system reported since the end of the nineteenth century.

The Montado system was studied under the FarmPath framework from March 2011 to May 2014. The overall goal of FarmPath was to identify and assess future transition pathways towards the regional sustainability of agriculture in Europe, as well as the social and technological innovations needed to progress along these pathways. One of the activities developed within the project was the co-creation of a vision of the farming sector for a local area in the Alentejo region for 2030 (all details in (Pinto-Correia et al. 2015)). This vision construction process took place in 2013, through five participative workshops, where

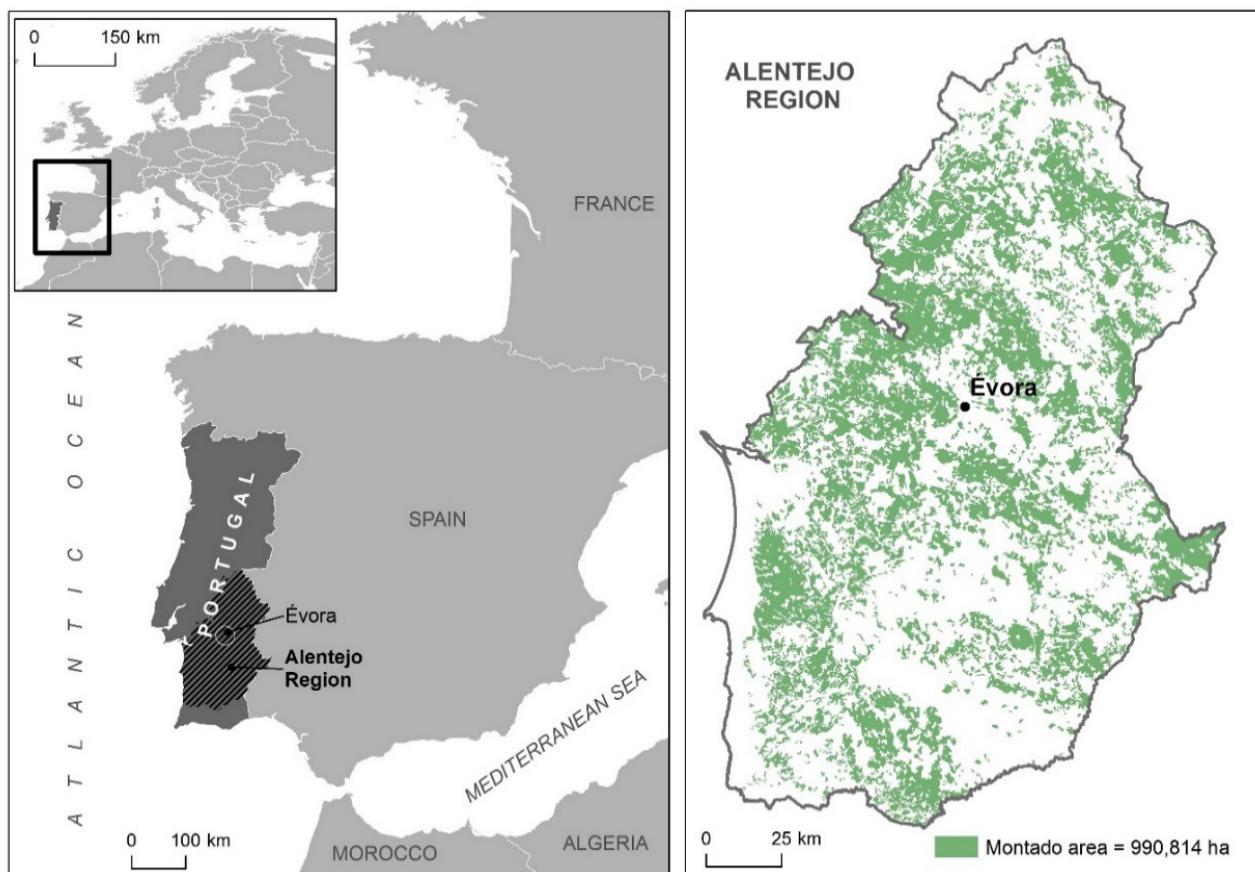


Figure 3: The location and coverage of the Montado in the Alentejo region (2006 data; source: (Godinho et al. 2016))

information regarding the most relevant visions and the pathways towards the desired future was gathered. The participants of this process included individuals dedicated to governmental and non-governmental activities related to rural issues, individuals acting upon the policies through managing the land (e.g., farmers), and those who benefit from the land (e.g., end users and recreationists).

Figure 4 presents the visions that resulted from this process. In both presented visions (A and B in Figure 4), the Montado is considered central to the future. In the first vision (vision A), the focus is on the promotion of a prestigious brand, the diversification of the products developed in this system, and the marketing of the goods

and services of the system focused on quality. In the second vision (vision B), besides the Montado, there is also an emphasis on the development of irrigated crops. This second vision considers the existence of new water sources for agriculture made available by the Alqueva dam. During the development of these visions, some participants (mainly farmers) considered that both visions could coexist in the territory, whereas others (mainly researchers) pointed out that each vision would lead to different results in the Montado land-use system. The group of participants that argued for vision A considered that the first vision would lead to the expansion of the Montado in terms of area and tree density, whereas

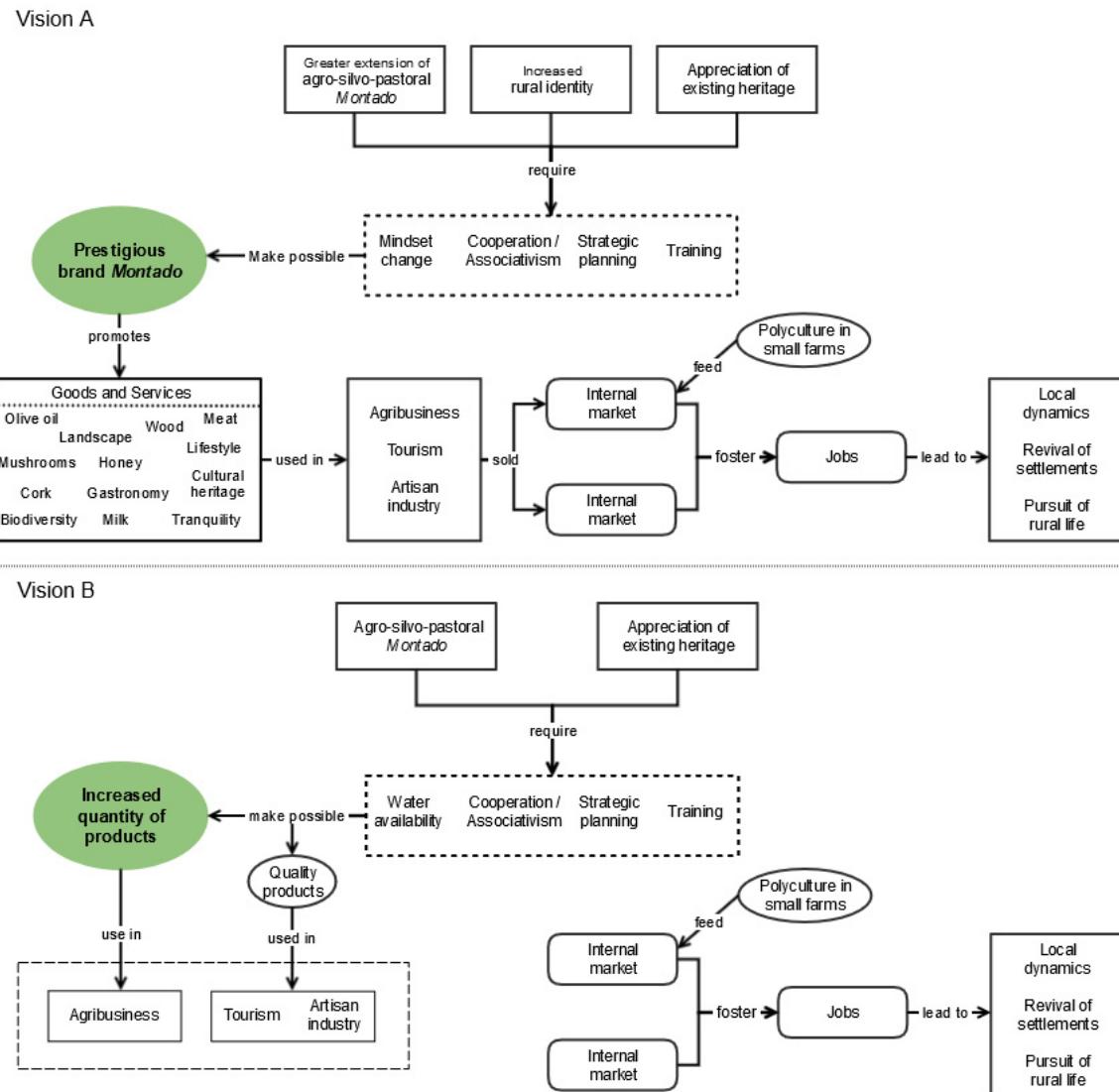


Figure 4: The visions produced in 2013 by a transdisciplinary team during the FarmPath project. In vision A, the Montado is thought of as the main driver of rural development, whereas in vision B, the intensification of production and irrigation are also considered in addition to the Montado system. (Source: this study)

the second vision implied a difficult trade-off between short-term, rapidly generated revenues (provided by intensification) and long-term, more slowly generated revenues (provided by extensive practices). These participants considered that the nature-based values of the system were better preserved in the first vision and that by 2030, the second vision would lead to a Montado system characterized by a patchy distribution across the territory, which could imply a decrease in its area. Participants who argued for vision B did not agree and considered that the area of the Montado would remain stable and that irrigated crops would expand elsewhere.

In 2017, the above-mentioned visions were re-examined in a new project designated HNV-Link. HNV-Link started in 2016 and will run until 2019. The objective of HNV-Link was to identify the innovations that are taking place in order to preserve the proper functioning of HNV farming systems across Europe. After identifying the innovations and the gaps in innovation, HNV-Link promoted opportunities to disseminate, exchange, and learn about innovations between the different case studies included in the project. Each case study of HNV-Link was designated a 'Learning Area' whereby inspiring innovation examples should be disseminated and experimented with in different contexts. The starting point of HNV-Link was to understand the socio-economic and environmental baselines of each case study and the main challenges, and, together with local actors, to construct a vision for 2030 in support of sustainable farming (particularly HNV farming). Since 2013, under the FarmPath project, a vision for the farming sector has been developed, and we opted to use this vision as the starting point of discussion with the local actors participating in HNV-Link. Our interaction with local actors started with interviews and continued with an innovation workshop. These interactions included farmers, administrators (people from local estate institutions that have responsibility for territorial management), representatives from associations and NGOs (people from farmers' associations, environmental organisations, and local action groups), and representatives from research and development institutions and other companies/institutions (people engaged in activities other than farming, such as nature tourism and cultural activities, amongst others). After reviewing these interactions, no further changes to the visions developed in 2013 were necessary, and therefore these visions were validated.

3.2 The analytical approach to understanding innovation processes in the Montado

Based on the desired future expressed in the visioning process that occurred in 2013 and validated in 2017, a search for innovation was developed. The analysis developed in the present study started with a comparison between the innovations identified in 2013 and those identified four years later. In 2013, the initiatives identified and analysed were designated as niches under the umbrella of the transition theory. In 2017, these niches were also used within the framework of HNV-Link and designated as innovations under the umbrella of innovation theory. For the present study, we opted to refer to the initiatives presented here as innovative initiatives.

In 2013, innovations were identified during interviews and participatory workshops developed along the visioning process described in Pinto-Correia et al. (2015). In total, 34 actors were involved in the different steps of this visioning process and interviews. As the analytical approach for the FarmPath project was based on transition theory, at that time we were not using the concept of innovations but referred to niches and pathways towards desired futures.

In 2017, innovations were identified within the HNV-Link framework and defined as a change in the institutional, regulatory, market, or farming approach that better enables the conservation of HNV farming and its characteristics (Beaufoy 2017). An HNV innovation may not necessarily have an explicit nature-conservation objective, but it should contribute to the maintenance and/or improvement of high nature-based values, even if it comes as a side-effect of another objective. Innovations were identified using a combination of a literature review comprising all sources of information (i.e., scientific papers and grey literature), interviews, and a workshop. The workshop was dedicated to identifying and discussing innovations with respect to their relevance to the achievement of the desired vision, the existing obstacles for their incorporation/adoption, and the need to guarantee that the desired future is achieved.

For the present study, the data collected in both FarmPath and HNV-Link were complemented by data collected in an ongoing initiative, named *Tertúlias do Montado*. The initiative established a regular and structured dialogue between researchers, landowners, land managers, public administrators, and the private sector regarding the sustainable development of the

Montado system. The *Tertúlias do Montado* initiative has been ongoing since April 2016, and so far, 15 sessions have been organised. In the first session, an agenda of issues was defined by the participants, termed the *common agenda*. The subsequent sessions were organised considering the issues identified in the common agenda. A skilled facilitator structures and coordinates the sessions, each of which lasts around three hours. Each session is audio-recorded and then evaluated by the participants at the end of the session. Between sessions, a core group reflects about what has happened so far, including the evaluations received. After this reflection, the structure and programme of the next session are prepared. The recordings of the sessions are used to produce a report that summarizes the key points, conclusions, and aspects that need further development. All sessions are publicly announced, and there is a blog where all reports and programmes can be consulted (<https://tertuliasdomontado.blogspot.pt/>). Currently, the list of contacts numbers around 200, and the average number of participants at each session is 24.

To complement the comparative analysis of innovations, a categorization of the innovations was undertaken by the authors as well as a tracking of the emergence of these innovations through time. The categorization was based on themes used in HNV-Link (see details in (Beaufoy 2017)). The themes are: (i) Social and Institutional (SI), which covers the social aspects of actors, such as the capacity to collaborate and self-organise, as well as the functioning of public institutions that can facilitate innovation-generating processes; (ii) Regulations and Policy (RP), which covers the design of norms that can support or favour innovation rather than impose barriers on its progress; (iii) Products and Market (PM), which includes the development of new products and commercialization processes that allow adding value to HNV farming systems, products, and areas; and (iv) Farming Techniques and Management (FTM), which includes innovations that reduce cost, increase efficiency, and are able to promote ecological and socio-economic objectives. This categorization helped the authors search for innovation comprising the several dimensions where new ideas and behaviours can appear.

4 Results and discussion

During the FarmPath project, the discussion around the two visions (Figure 4) included elements other than those related to the Montado agro-silvo-pastoral system. The results presented in this section are derived mainly from the

analysis of vision A (Figure 4), as that vision is dedicated to the sustainability of the Montado. Further, we focus our analysis on those features that can be compared with the outcomes of HNV-Link working solely on the Montado and *Tertúlias do Montado* (which was also focused on the Montado). Table 1 presents a comparative analysis of the pathways (identified in 2013 within the framework of transition theory) with the innovation needs (identified in 2017 based on innovation theory). To further support our analysis, we complement Table 1 with data derived from the ongoing discussions promoted in *Tertúlias do Montado* (Table 2). The pathways and needs summarized in Table 1 helped in identifying the initiatives described in Table 3. The decisions regarding the innovative nature of the initiatives listed in Table 3 were taken considering the desired future expressed in the visioning process, the pathways, needs, and issues identified (Tables 1 and 2), and using the case study as a reference point. Therefore, some of the initiatives might not be considered innovative in other places, yet within the case study they are either very recent or existing for a long period but are not widespread.

4.1 Framing the innovative initiatives

The information included in Figure 4 and Tables 1 and 2 supports the understanding of the interactions between the established regime (i.e., the typical structure of acting, see Figure 1) and the initiatives listed in Table 3. The initiative of *Tertúlias do Montado* was identified as being within the SI theme (initiative No. 10, Table 3). In April 2016, the first session for *Tertúlias do Montado* was undertaken, and the common agenda was built. Table 2 presents the topics that were identified, highlighting those connected to the issues identified and discussed in Table 1. During the first session of *Tertúlias do Montado*, 17 issues were identified by 20 participants: 11 researchers, 5 landowners and land managers, 3 public administration members, and 1 member of a non-governmental organisation. Six of the 17 issues are not directly related to the overall discussion summarized in Table 1. The remaining 11 issues are related to the ongoing discussion initiated in 2013. This overlap indicates a perpetuation of issues that can hinder the achievement of the identified desired future.

The extensive nature of the Montado system has been experiencing a set of pressures promoting intensification or abandonment that might imply its disappearance in the future (Godinho et al. 2016). However, the visions described in section 3.1 above reveal that the Montado is considered to be a key landscape element, and therefore

we placed our focus on the initiatives that are in place and which can promote changes in the regime that favour its preservation and enhancement.

Tables 1 and 2 show that the design of public policies that support farmers in their maintenance of the system is considered necessary. This need has been reported in several previous studies and reflects the fact that current agriculture and forestry policies are not aligned with the multifunctional nature of the system (Guimarães et al. 2018). This lack of alignment becomes even more important when the current policies that support cattle production create an imbalance between the pastoral and forestry components of the system (Godinho et al. 2016).

Since 2013 (Tables 1 and 2), the lack of technical support to farmers has been a recurrent issue. The almost total interruption of public extension services in Portugal (Guimarães et al. 2017) has generated a gap between knowledge production and farming practices that no formal public structure has been able to overcome. Furthermore,

the collaborative requirements of the systems' actors and the need for better communication between farmers, public administrators, decision-makers, and researchers have been identified since 2013. Such communication was considered necessary to help farmers define management actions based on the best knowledge available and also to contribute to the design of policies that are effective and useful for the maintenance of the Montado system.

Finally, the Montado is part of the Alentejo heritage, so its maintenance can be argued for not only on the basis of the productive or ecosystem services components but also on account of the cultural landscape that it represents. The acknowledgement of such relevance has been clear since 2013 (Tables 1 and 2). Nonetheless, the level of knowledge about this aspect of the system is considered low, which justifies the reference to aspects such as creating an increased level of awareness of the Montado system, allowing open access to parts of the Montado (which is mostly privately owned), and the creation of a

Table 1: Changes that need to occur with respect to the maintenance of the Montado agro-silvo-pastoral system

2013 Pathways (FarmPath)	2017 Innovation needs (HNV-Link)	Common points
Design policy measures able to promote multifunctionality	Design agri-environmental measures: Results-based, action-based, X or mixed to support the HNV of the Montado	
Open access to parts of the Montado for tourism	Increase tourism-based activities in the Montado for the valorisation of the Montado landscape	X
Revive extension services to generate a more effective and wider dissemination of best practices in the management of the Montado	Conduct training and rural extension to provide technical advice to farm managers on embracing multifunctionality	X
Design a prestige brand for the Montado	Promote the Montado and its products and services by showing their uniqueness and excellence through the design of a prestigious brand associated with the production system and/or revitalizing product-associated brands	X
Create a network of actors working towards the definition of common goals in the Montado	Promote discussion groups and space for interaction among Montado actors	X
Increase the participation of local actors in the design of policies that impact their activities	Consult local actors for the design of support measures and the application of rules that impact their activities	X
Support small to medium-sized industries and short supply chains		
Define the strategy for each subtype of the Montado system		
Disseminate knowledge and educate the general public about the Montado		
Increase the participation of landowners and land managers in the activities of producers' organisations	Improve soil management to restore and gain fertility Increase oak recruitment (i.e., tree regeneration) Implement monitoring activities to support grazing management decisions	

How to achieve the vision A focus on the valorisation of the Montado

Note: In the far-right-hand column, the results of 2013 and 2017 that are similar (common) are marked with 'X'. That is, after 4 years, we identified similar needs.

prestige brand. The branding of the Montado would allow the system to be recognised while also contributing to the valorisation of the commercial products derived from it.

4.2 The initiatives identified

Table 3 lists the 14 innovative initiatives identified in the present study. All the initiatives might contribute to the desired future described in section 3.1 above and are related to the pathways, needs, and issues described in Tables 1 and 2. Considering the nature of these innovations, they were classified into distinct themes.

The PM theme is the theme containing the largest number of identified innovations, including EU quality schemes. This is not a recent initiative, has exist in the area since 1994. However, the participation of producers in such product and marketing schemes is very low, representing only around 1% of the estimated producers' population within the case study. Still, in the PM theme, we identified two enterprises that sell meat and meat products directly to consumers with a clear reference to the Montado system and its inherent differentiated quality

(initiative No. 3, Table 3). We also identified one agrotourism company with a clear link to agro-silvo-pastoral activities (initiative No. 5, Table 3). Since 2016, initiatives to promote food products of the Montado organised by the private or public sectors have been detected (e.g., initiative No. 11, Table 3). We did not identify a brand that integrated all the values of the Montado. The lack of such an initiative has been a topic of discussion since 2013. The traditional mentalities still rooted in a productivism perspective have been described as hindering the collective actions that are needed to advance such an initiative (Pinto-Correia et al. 2014). Further, the lack of capacity of farmers to work collectively has also been signalled as a reason for the lack of implementation of this action. Therefore, there appears to be a lack of social and institutional capacity to move forward with any collective actions

In the SI theme, most of the initiatives identified are recent. The oldest initiative is the zonal program of Castro Verde (initiative No. 2, Table 3), which is an innovation in both the SI and RP themes because it involved the development of collective actions that culminated in the development of a unique program where specific regulations were put in place. Another initiative identified

Table 2: The common agenda developed at the beginning of the Tertúlias do Montado initiative

Issues in Tertúlias do Montado (2016)	Comparative analysis with the outcomes achieved in FarmPath and HNV-Link
Climate change scenarios and adaptive strategies	
Impact of the drop in the price of cork	
Spreading residual muds (e.g., from dams and water treatment plants) for soil improvement	
Legislation and the lack of specialized training for cork harvesters	
Specific valorisation of the holm oak of the Montado	
The survival of the Montado in the context of crisis and demographic changes	
Application for the Montado as UNESCO cultural landscape heritage	With implications for the vision co-created
Increasing awareness of society	An issue identified in both projects
Reforestation	Linked to issues related to oak recruitment
Tree ageing and death	
Monitoring the Montado system and the activities occurring in it	This was identified as necessary in both projects
Payment for non-market functions	The design of policies that promote multifunctionality and the promotion of the value of nature are related to this issue
Policies considering the specificities of the Montado and conflicting goals	
Accessibility to the Montado	Related to the potential for developing tourism and recreational activities
New ways to capitalize the Montado	Related to the innovations identified, mainly those related to markets and products
Soil and its vital importance	Linked to FTM
Grazing management and impact	

was an informal group of farmers and researchers dedicated to conservation agriculture created in 2002 with the main focus being on soil quality (initiative No. 4, Table 3). Within the SI theme, one farm has adopted new organisational structures (initiative Nos. 6 and 8, Table 3) where the landowner shares the land for the implementation of projects in which decision-making is taken by the project leaders, as well as community-supported agriculture, which represents a new relationship between farmers and consumers. In 2009, an informal network of farmers, researchers, and users was created to develop ideas on how to promote and protect the Montado agro-silvo-pastoral system (initiative No. 10, Table 3). This initiative is the only one that no longer exists, a result of a lack of understanding and commitment between those initially engaged in the initiative. In 2016, a process of dialogue between landowners, land

managers, researchers, public administrators, and users of the Montado was initiated (initiative No. 10, Table 3). Within the same line of cooperation, two other initiatives were identified (initiative Nos. 12 and 14, Table 3): the construction of a results-based payment scheme measure that represents a collective action between different stakeholders; and the development of a mobile poultry processing unit that, if put in place, will bring about a new organisational structure for poultry processing so far only developed in stationary units. Both of these initiatives are in development but not yet instituted.

In the RP theme, only a few innovations were found (Table 3), and some of the changes that were considered necessary were at the regulation and policy level. Specifically, the development of policies that secure advantages and support farmers if they choose to implement management practices that promote nature-

Table 3: Innovative initiatives identified and detailed

No.	Initiative details	Starting date	Innovation type ¹
1	EU quality schemes for several products that may be produced in the Montado: PDO – Protected Designation of Origin and PGI – PGI - Protected Geographical Indication – ‘Carne de Bovino Mertolenga’ (PDO); ‘Carne Alentejana’ (PDO); pork – ‘Porco Alentejano’ (PDO); lamb – ‘Borrego de Montemor-o-Novo’ (PGI); honey – ‘Mel do Alentejo’ (PDO); and cheese – ‘Queijo de Évora’ (PDO).	1994	PM
2	Zonal Programme of Castro Verde – within the Natura 2000 payments (Zonal supports): www.hnblink.eu/download/Portugal_LocallyadaptedAgri-environmentalmeasure.pdf	1995	RP and SI
3	Production and direct meat sales: Solar da Giesteira (https://solardagiesteira.pt/) Herdade do Freixo do Meio (www.herdadedofreixodomeio.pt/)	1998/2001	PM
4	A healthy soil as the core of the Montado production system: Informal group for conservation agriculture http://www.hnblink.eu/download/Portugal_HealthysoilasthecoreoftheMontado.pdf	2002	FTM and SI
5	Agro-tourism associated with agro-silvo-pastoral activities: www.herdadedaserrinha.com	2007	PM and FTM
6	Independent projects hosted by a large farm estate: (http://www.hnblink.eu/download/Portugal_Independentprojects_ThecaseofHerdadedoFreixodoMeio.pdf)	2008	SI
7	CRIE Montado network	2009 – no longer active	SI
8	Community-Supported Agriculture (www.herdadedofreixodomeio.pt/)	2014	FTM and SI
9	Agri-environmental action-based measure – Extensive grazing: support for the maintenance of agro-silvo-pastoral systems in the Montado	2015	RP
10	Tertúlia do Montado (http://tertuliasdomontado.blogspot.com/)	2016	SI
11	Local promotion of local products: the Acorn Week (http://www.hnblink.eu/download/Portugal_2016_Acornsfoodforhumans_retroinnovation.pdf)	2016	PM
12	Agri-environmental results-based payment scheme measure	Under development	RP and SI
13	Montado Monitoring System – Development of a web/mobile tool to monitor pasture quality and animal movements	Under development	FTM and SI
14	Project for the development of a mobile poultry processing unit http://www.hnblink.eu/download/Portugal_Mobilepoultry.pdf	Under development	SI, PM, FTM, and RP

Note: Innovation themes are as follows. SI: Social and Institutional innovation; RP: Regulations and Policy innovation; PM: Products and Markets innovation; FTM: Farming Techniques and Management innovation.

based values. In the RP theme, three initiatives were identified: the zonal plan of Castro Verde with specific regulations (initiative No. 2, Table 3); in 2016, the first agri-environmental measure adapted to the Montado was implemented (initiative No. 9, Table 3); and, very recently, a process to implement an agri-environmental result base scheme to the Montado has been started (initiative 12, Table 3). The small number of initiatives found for the RP theme is also consistent with the context already given, in which adapted policies are considered to be needed but are lacking.

Within the FTM theme, soil fertility correction using conservation farming techniques has been carried out by some land managers in the Montado, with impressive results, mainly regarding the increased pasture biomass production available across the year for grazing animals, which has brought about a drastic reduction in the need for feed supplements (initiative No. 4, Table 3). These management practices have been developed in close connection with research through an informal group interested in conservation agriculture. A question that is posed is the reason behind the limited expansion and uptake of such efforts, given that the economic outcomes are apparent in a short period after adopting new practices. During the innovation workshop, participants suggested the lack of support systems for guiding farmers during the implementation of new practices. Nonetheless, the 'Informal Group for Conservation Agriculture' states that all farmers who have requested guidance have received it. There may be inertia that delays the adoption of new management actions with clear economic benefits, possibly related to the need for participants to make an initial financial investment.

4.3 Is the Montado in transition? When does innovation become custom?

The results in Table 3 show that most innovations occurring within the territory are associated with the ways in which farmers approach markets and sell their products, whereas farming techniques and management, social and institutional, and regulatory/policy innovations are scarce. This lack of innovation might be explained by the institutional and regulatory barriers (already identified in 2013) that continue to hinder the development and propagation of initiatives that support HNV farming, including in the Montado. Although pathways and examples of regulatory and policymaking changes were identified, their concrete application has not yet been achieved. Our results support the arguments of Bjørkhaug

and Knickel (2018) in their analysis of the role of governance in transition processes. In our case study, we were not able to identify policy innovations that imply a changing role of the state from being a 'provider' to becoming an 'enabler' of activities. The inability to innovate at this level might contribute to the lack of implementation of innovations at other levels (e.g., farming practices). In support of the findings of Knickel et al. (2009) it seems that the roles of organisations facilitating innovation, as well as public innovation policies, are critically important and further research is needed on how to accelerate the changes required at these levels.

In 2013, under the FarmPath project, we identified niches applying solutions to problems that the established regime was not able to overcome. After five years, these niches were detailed and categorized in terms of innovations under HNV-Link project. In some cases, they have existed for more than 20 years, and there is no indication that they will disappear (e.g., initiative Nos. 1, 2, and 3 in Table 3). However, they continue to be niches, as similar initiatives have not been identified. At the same time, we can conclude that these niches seem to have arisen as a response to various shortcomings of the current regime, as they have been around for a considerable amount of time. Therefore, these niches might still be in the pre-development phase, where niches develop, but the changes are not yet visible (Sutherland et al. 2015). Perhaps this will lead to the structural changes that need to occur and become apparent so that a new regime is established. However, looking at the oldest initiatives, we might ask why this process is taking so long and whether these niches have crystallized. Although we are unable to understand the reasons behind the lack of interaction between the niches and the regime, we acknowledge that transitions are long-term processes that include different stages, and in the Montado case, the transition is yet to happen. Guimarães et al. (2018) identified 7589 holdings with agroforestry areas in Alentejo, of which 5236 are in the Montado; of those 5236 holdings, only 75 were identified as producing Carne Alentejana PDO, and 82 were producing Carne Mertolenga PDO (initiative No. 1, Table 3) (*Inquérito aos Agrupamentos de produtores de produtos com DOP/IGP/ETG* 2016). Future studies should try to detail the reasons behind the lack of participation of farmers in this type of quality branding. Perhaps there is a disinterest caused by problems with the certification process or an unwillingness to change even if this change leads to the desired outcomes. This low participation issue needs to be addressed so that strategies to overcome the obstacles can be defined. In this case, it is

clear that the dissemination of certification schemes is not sufficient for their use to spread.

Other initiatives identified in Table 3 are good examples to support the argument that knowledge and persuasion (Figure 2) are not sufficient for an innovation to become custom. Since 1998, there has been one company selling meat directly to customers (initiative No.3, Table 3), and since 2002, solutions have been available for increasing soil fertility. However, these initiatives continue to be exceptions to the rules. Our results indicate that the innovation-brokering process is much more complex than currently conceived and that knowledge dissemination and brokers *per se* are not sufficient for innovation to spread. We have formed a new perspective found by categorizing the initiatives in different innovation themes (i.e., social and institutional, regulations and policy, products and markets, and farming techniques and management). This new perspective helps to explain the lack of capacity that some initiatives show for passing from innovation to custom. Our results indicate that interconnection between innovations in a multi-level format might be needed. This finding is consistent with the SI innovation framework, as it appears that to put an innovation-brokering process into place, changes at different levels need to occur on account of their interconnectedness. Therefore, it is not just a question of giving visibility to innovations so others can make use of them; changes at different levels need to occur simultaneously. Beaufoy (2017) presented a qualitative analysis of the innovations mapped in the 10 study cases in the first stage of the HNV-LINK project and found that innovative solutions that allow HNV farming to be maintained or improved in a sustainable manner are occurring in certain areas. However, none of those innovations is occurring on a sufficient scale to enable the whole range of challenges faced by HNV farming to be tackled. Beaufoy concluded that the most successful cases of sustainable HNV farming included a long-term, multi-actor process where innovations of the four themes (i.e., social and institutions, regulations and policy, products and markets, and farming techniques and management) were occurring simultaneously and in synergy. Our findings indicate that this might also be the case for the Montado. Most of the innovations that we found were in the products and markets theme, and the most recent ones were in the social and institutions, regulations and policy, and farming techniques and management themes. Even the actors participating within the different projects highlighted that innovative ideas struggle to overcome the barriers that the established manner of doing things imposes.

The empirical data collected in the Montado case also indicate that mentalities, values, and cultural standards

influence the acceptance and incorporation of new/different ways of acting. Schlaile et al. (2017) concluded that focusing on the technological part of innovation is not sufficient when dealing with sustainable transition and that more normative dimensions should be taken into consideration. Following Rogers (2003) innovativeness criterion (i.e., the degree to which an individual adopts a new idea), it would appear that the actors within the case study overall have a low level of innovation adoption. In fact, in the definition of the first vision (Fig. 1), a change in the mentalities of relevant actors was identified as necessary for the realization of transitions that can contribute to the sustainability of the Montado. Such identification by the actors themselves strengthens this argument. Despite the possible slow incorporation of innovations, more than 50% of the innovations identified in Table 3 have been developed after the definition of the desired vision in 2013. This indicates that the overall process of change in the Montado is underway, and, as explained in transition theory, changes in one subsystem promote change in others.

5 Conclusions

In this study, we started characterizing a process of change towards the desired vision of the Montado, an agro-silvo-pastoral system in southern Portugal. These changes were found in several subsystems of the regime, supporting the argument that for innovation to become custom, interconnected innovations need to occur. The fact that different typologies of change have been identified might indicate that the interactions between economic, cultural, technological, ecological, and institutional subsystems contribute to inducing changes in these subsystems. Nonetheless, the fact that initiatives that have lasted for more than 20 years are still designated as innovative indicates a slow process of incorporation of good and different ideas. A clearer picture of this process is needed. A detailed analysis and understanding of the factors that hinder the expansion of these innovations needs to be fully developed, as the changes required for moving to a sustainable path for the Montado are urgent.

The analysis developed in this article provides empirical evidence that having good ideas and sharing them is not enough for innovation to become custom nor for niches to become incorporated into the regime and change it. Knowledge co-production and learning spaces can be useful, but for knowledge to become transformative, the governance systems also need to be re-thought and permeable to innovation. Policies and institutions need

to become more flexible and responsive to the changes that are needed to be put in place. Support for pilot initiatives and endogenous resources are necessary so that innovations can be incorporated into moving towards the desired sustainable transitions. Pilot experiments will allow progress to be made in the analysis of enabling factors as well as of the factors that delay the required transition. Future work should continue exploring how an enabling environment is made for the incorporation of innovation into farming. Although the results of this study show that synergy across sectors is needed, the way to achieve this synergy presents a challenge.

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