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Place-based network organizations and embedded entrepreneurial learning: Emerging paths to sustainability

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ABSTRACT

Purpose – This study develops an original six-phase model describing entrepreneurial learning in the transition of place-based enterprises towards a sustainable exploitation of natural common resources (commons).

Design/methodology/approach – The six-phase model proposed by this study explains the learning processes involving place-based enterprises through two important existing theories: adaptive co-management and Lachmann's evolutionary, embedded theory of entrepreneurship. The proposed model integrates these two theories on the basis of a longitudinal case study on the fishing enterprises in an Italian marine protected area.

Findings – In the case study, the success factors identified by the adaptive co-management literature proved important in enabling an embedded entrepreneurial learning process consistent with Lachmann's view. The case analysis allowed the authors to cluster these learning processes around six phases. Further, even if traditional fishing is not knowledge-intensive, this case shows the transition to a sustainable business model required intense efforts of educated institutional work and scientific research. Interestingly, the key learning processes were enabled by the emergence of a larger, networked social entity (a network form of organization) including the community of fishermen, the marine protected area (MPA) management, and a network of scientists studying the marine area ecosystem.

Research limitations/implications – This study is explorative and relies on a single case study. Despite this limitation, it opens up new research paths in the fields of entrepreneurship, institutional work, network organizations, and adaptive management of the commons.

Originality/value – This study is strongly inter-disciplinary; it proposes an original model based on a theoretical view that is highly innovative for organization and management studies; and addresses a relevant but overlooked issue with important societal implications.

Keywords – environmental sustainability; network organization; commons; knowledge co-production; entrepreneurial behavior; organizational learning

Paper type – Research paper

INTRODUCTION

Place-based common resources, also called the commons (such as the environmental biodiversity of a valley or the beauty of a landscape), are often crucial to enable many types of economic activities. In classical economic theory, the government is expected to take care of such resources. But a growing number of reported cases suggests that other social actors, such as associations, local communities, research institutions, or business networks, can play a pivotal role in transforming local common resources into engines of prosperity and sustainable development, by complementing the traditionally defensive logic of public administration bodies (Haugh & Pardy, 1999; Thomas and Cross, 2007; Dameri and Ricciardi, 2015).

In particular, place-based enterprises (Shrivastava and Kennelly, 2013) are driving growing scholarly attention for their impact on place-based common resources. Despite several virtuous exemplars, place-based enterprises in many cases are driven by individualistic and conservative strategies, and lack the entrepreneurial attitudes, organizational culture, and/or innovation capabilities that would be needed for facing the emerging sustainability expectations of today's society (Parrish, 2010). Therefore, only rarely do place-based enterprises actually develop new and effective business models based on educated, "smart" management of local resources; it is not surprising, then, that today place-based enterprises are rarely as beneficial for the local community as they could be, even proving, in many cases, detrimental or hostile to sustainability policies (Allan and Curtis, 2005).

Entrepreneurial learning (Watts, Cope, & Hulme, 1998; Wang and Chugh, 2014) could be a key to better exploit the potential contribution of place-based enterprises in enhancing the sustainability and resilience of social-ecological systems (SES) (Walker *et al.*, 2004). In fact, the emerging societal and ecological challenges of our era strongly call for new, sustainable business models, and the key process through which a society develops and experiments with new business models is entrepreneurial learning (Franco and Haase, 2009; Shane, 2012; Schumpeter, 1934).

Despite the relevance of this issue, the role of entrepreneurial learning in enabling prosperous place-based enterprises, based on the sustainable exploitation of the local commons, is completely under-investigated. This is quite surprising, since there is growing interest in lines of research focusing on the relationship between entrepreneurship and environmental sustainability. These lines of research are developing concepts such as sustainable entrepreneurship (Parrish, 2010; Thompson, Herrmann, & Hekkert, 2014), transformative entrepreneurship (Tobias *et al.*, 2013), and embedded/situated entrepreneurship (McKeever *et al.*, 2015).

Probably, this lack of scholarly attention on the processes of entrepreneurial learning aimed at a more sustainable exploitation of the commons is also due to the nature of the main theories usually adopted by the scholarly community (Lindgren and Packendorff, 2009) to explain organizational learning. In fact, organization and management scholars usually adopt either the resource-based view (RBV) (Kraaijenbrink *et al.*, 2010) or the Schumpeterian view (Schumpeter, 1934) as a general theoretical framework to explain knowledge-related phenomena. Both the RBV and the Schumpeterian view are well-established theories that provide many valuable insights on entrepreneurial learning, but these theories are based on the assumptions that competition is the key triggering mechanism of learning, and that *competitive* advantage is its key expected outcome. Instead, as the case presented in this study will demonstrate, the processes of entrepreneurial learning aimed at a more sustainable exploitation of the commons are mainly triggered by institutional enforcements and/or perceived threats of SES collapse; further, the main expected outcome of these processes is *cooperative* advantage. Therefore, both the RBV and the Schumpeterian view are poorly equipped to explain

entrepreneurial learning in the transition of place-based enterprises towards a sustainable exploitation of the commons.

This study addresses this gap. In order to build a model explaining this type of entrepreneurial learning, this study integrates two views that have been overlooked by the organization, management and entrepreneurship literatures so far: the adaptive management view, on the one side, and Lachmann's view of entrepreneurship, on the other side.

Recent literature on SES resilience has developed the adaptive management view, which is rooted in systems theory and ecology studies (Folke *et al.*, 2005). Lachmann's view of entrepreneurship is much less popular with the management scholars than the works of other Austrian theorists of the disequilibrium, but it is at least as interesting and provides a socially embedded, evolutionary view of entrepreneurship that is particularly suited to the goals of this study (Chiles *et al.*, 2007). Although stemming from different disciplines, these two approaches share the claim that learning is a socially embedded phenomenon, which influences and is influenced by the rules, values, and needs of the involved actors; thus, according to both theories, knowledge co-production at the societal level is the key trigger and outcome of entrepreneurial learning (Schuttenberg and Guth, 2015).

This article suggests that these two approaches, as the two lenses of a pair of glasses, provide an integrated, higher-level view of the phenomenon of entrepreneurial learning in those place-based enterprises that depend on the exploitation of a common. Leveraging these two views, this study helps pave the way towards an integrated theory of adaptive, embedded entrepreneurial learning towards more sustainable business models.

Then, this article presents an analysis of an exemplary case to achieve an in-depth understanding of the concrete process through which adaptive, embedded entrepreneurial learning takes place. The case focuses on the entrepreneurial learning processes that have involved the fishermen of the marine protected area of Torre Guaceto, Italy, in the last fifteen years.

Even if traditional fishing is not a knowledge-intensive business (Smith, 2006), this case shows that the transition to a new, sustainable business model of fishing requires intense learning and advanced scientific research. Interestingly, the related learning processes did not occur within the boundary of the place-based enterprise (the artisan fishing enterprise), but within a larger, networked social entity (a network form of organization) including the community of fishermen, the marine protected area (MPA) management, and a network of scientists studying the marine area ecosystem.

This study confirms that, in traditional place-based enterprises, a knowledge-intensive, sustainability-oriented change process can be successfully triggered and managed by leveraging the adaptive management approach. The six-phase model of adaptive, embedded entrepreneurial learning that this study proposes enhances understanding of the conditions under which, and the steps through which, this process can successfully take place.

In the light of the proposed model, place-based entrepreneurship can be viewed as the learning-intensive process of (a) creation and/or recognition of new, sustainable opportunities to create value, and (b) experimentation of these opportunities.

This study lies at the crossroads of different disciplines and streams of studies, and then its contribution is at least threefold.

First, this study contributes to the literature on entrepreneurial learning by offering insights on how the entrepreneurial exploration of new, more sustainable business models emerges and unfolds in

traditional place-based enterprises whose long-term survival depends on the resilience of a common. The model of adaptive, embedded entrepreneurial learning proposed by this study is completely original and integrates two theoretical views that, although very interesting, have been overlooked by the entrepreneurship literature so far: adaptive management and Lachmann's view on entrepreneurship.

Second, this study contributes to the literature on the role of institutions in organizational life. The results presented here show how the normative changes and the processes of knowledge co-production in the Torre Guaceto case resulted in (a) the participated elaboration of new institutional arrangements evolving throughout time, and (b) the creation of a new network organization including the fishermen, the scientists, and the MPA management as a bridging actor.

Third, this article contributes to the studies on adaptive management and the commons. These lines of research offer valuable insights on the co-production of knowledge that occurs when scientists and local communities cooperate to govern a relevant ecosystem. Nevertheless, these research studies have so far suffered from a poor understanding of the phenomena of entrepreneurship, organization, and management relating to SES dynamics, since traditionally the scholars studying adaptive management and the governance of the commons have a background in the sciences of life, or in law and policy-making. This study provides an interdisciplinary view, which highlights the need that biologists, policy-makers and entrepreneurs actively cooperate to develop and experiment with new, more sustainable business models.

BACKGROUND

Insights from organization and management studies: the role of learning for competitive advantage and for smart, place-based enterprises

The studies focusing on the role of knowledge in organizations traditionally build, implicitly or explicitly, upon the RBV (Kraaijenbrink *et al.*, 2010). The RBV has the great merit of having drawn scholarly attention on knowledge as a resource (Harrison and Leitch, 2005), thus inviting researchers to focus on learning as a key process in strategic management (Spender, 1996) and entrepreneurship (Alvarez and Busenitz, 2001). On the other hand, there is a growing perception that the traditional RBV is not enough, and should be complemented with further theoretical approaches for fully understanding the role of knowledge resources and learning in firm survival. In fact, the RBV implies that knowledge and learning are important because they are essential to face *competition*. All the lines of research building upon the traditional RBV are typically founded on the shared idea that the key expected impact of successful organizational learning consists in enhanced competitive performance. However, the limits of this view are becoming apparent. In effect, there is growing awareness that knowledge is the crucial resource not only to achieve firm success through efficiency and competitive advantage, but also to address the risks of system collapse that threaten business environments in today's globalized scenario. The paramount ecological, societal, and demographic problems that our societies are facing can disrupt even the best firms: in the face of these threats, outperforming all competitors may become a useless achievement.

In a recent editorial in the *Journal of Intellectual Capital*, Dumay (2013) proposes the analogy of the canary in the coal mine to highlight that leveraging knowledge resources to build strong organizations (i.e. beautiful canaries) is important, but not sufficient. In fact, if "we build strong organisations without also concentrating on building a sustainable environment, surely the canaries will not be able

to survive. So on reflection, we need both, in order to progress beyond the crossroads to a new IC-based future” (Dumay, 2013, p. 8). In other words, even researchers investigating intellectual capital, which has been soundly rooted in the RBV for years, are increasingly interested in the role of learning for sustainability and cooperation. A very recent study (Dameri and Ricciardi, 2015) builds a bridge between the smart city and intellectual capital literatures, arguing that “smart” intellectual capital can and should be developed at the territorial level, to enable not only higher competitiveness of the SES but also, and even more importantly, enhanced SES sustainability, resilience, and quality of life.

Of particular interest is the concept of place-based enterprise, introduced by Shrivastava and Kennelly (2013). In their study, the authors criticize the “placeless” approach of mainstream enterprise sustainability research. They argue that those enterprises whose resources, productive activities, and ownership are anchored in specific local places can play a pivotal role in fostering ecological and social sustainability in local communities.

This growing interest in the relationship between businesses and local environments is apparent also in the community of entrepreneurship researchers, who have recently developed the concepts of sustainable or green entrepreneurship; (Kirkwood and Walton, 2010; Parrish, 2010; Thompson, Herrmann, and Hekkert, 2014), transformative entrepreneurship (Tobias *et al.*, 2013), and embedded/situated entrepreneurship (McKeever *et al.*, 2015). Interestingly, these research avenues converge with the recent studies on regional evolution and green innovation developed by evolutionary economic geography (Cooke, 2012; Cooke, 2013). Nevertheless, the learning needs and processes of place-based enterprises have remained substantially uninvestigated (Wyer *et al.*, 2000). The theories of organizational and entrepreneurial learning rooted in the RBV, that assign a prominent role to the control and recombination of VRIN resources, are probably poorly equipped to explain entrepreneurial learning in place-based enterprises involved in the protection of environmental resources. The authors of this study deem that an interdisciplinary effort is needed to address this issue.

Insights from resilience studies: the adaptive co-management approach

The management of fragile environmental common resources, such as fisheries, watersheds, or clean air, is at the core of an important stream of studies stemmed at the crossroads of ecology and policy research, aiming to enhance the resilience of ecological systems.

Scholars engaged in these studies soon realized that, in order to pursue more resilient ecological systems (Walker, Holling, Carpenter, and Kinzig, 2004), it is impossible to rely on technocratic management translating scientific knowledge top-down into policies such as guidelines, rules, roles, incentives, or sanctions (Brunner *et al.*, 2005). First, in most cases, science does not have in advance all the knowledge actually needed to effectively protect the natural resource because ecological systems are often too complex and instable, thus making the impact of the policies unpredictable on an *a priori* basis. Second, policies do not just land in an empty, neutral space: they are implemented in a social environment shaped by many extant interests on the one side, and institutions (e.g. rules, norms, identities, traditions, beliefs) on the other side. Social actors can influence, fight, boycott, violate, ignore, or misinterpret the policies, and this further enhances the unpredictability of the effects of the designed policies on the resilience of the ecological system. Therefore, in most cases, the effective governance of an environmental resource implies the recursive, dynamic, science-based, feedback-driven management of an SES (Berkes *et al.*, 2000) and must necessarily build upon collective, inter-disciplinary, adaptive *learning processes*. This learning-based approach to the

management of natural resources is labelled “adaptive management”, whilst the label of “adaptive governance” indicates the wider, political coordination of several adaptive management initiatives in a social context (Folke *et al.*, 2005).

According to the adaptive management approach, the knowledge resources that adaptive managers can yield by studying feedback on their decisions may be even more important than the very impact of the decisions. In fact, once acquired, knowledge enables the capability to further adjust the decisions and improve the policies. For this reason, adaptive management implies a *strongly experimental attitude of decision-makers*; in certain conditions, this attitude may even translate into the so-called “plan for failure” approach (Allan and Curtis, 2005).

This is an extremely interesting standpoint, which calls for an inter-disciplinary effort for understanding the role of organizations, business owners, and entrepreneurial forces in environmental management. In fact, there is growing evidence that adaptive management initiatives cannot work if they are conducted top-down through abstract institutional design principles, by biologists and experts of policy-making only. The involvement of the local community and key stakeholders has proven crucial for adaptive management success (Armitage *et al.*, 2008). These results have recently led to a growing interest in the so-called adaptive *co-management*. Adaptive co-management is based on the co-production of adaptive knowledge (Wyborn, 2015); therefore, it implies inclusive decision-making, by directing significant attention to the role of science on the one side, and the broader economic, social, and institutional context on the other side (Schuttenberg and Guth, 2015). The most recent reviews on the adaptive management approach agree that, whilst the interplay of science, policy-making, and the local social structure is crucial to SES resilience, this interplay is regrettably under-investigated to date (Chaffin *et al.*, 2014). In particular, a better understanding of the role of local businesses in the learning processes of adaptive co-management would be extremely relevant. The studies on the governance of environmental (common) resources are strongly focused on democracy and community issues, and tend either to disregard the role of businesses, or to consider only the negative effects of economic interests and business-oriented approaches (see for example Allan and Curtis, 2005).

Despite their still poor understanding of the role of local businesses, adaptive management studies provide valuable insights to better understand the potential role of entrepreneurial learning in paving the path towards a sustainable economy. The success factors identified so far by the literature on common resource governance and adaptive co-management/co-governance are particularly relevant to this study (Table 1).

The success factors listed in Table 1 may be usefully borrowed to describe the conditions under which *successful entrepreneurial learning is possible* when the critical natural resources, which an industry or business depends upon, are at stake. The results of this body of research also shed light on the complexity of this particular type of entrepreneurial learning. In fact, the literature on co-management clearly shows that, in adaptive governance contexts, entrepreneurial learning is not just performed internally by businesses or new ventures, but is a highly distributed and participated process, which stems from the co-activation of the experimental capabilities of several different actors in a given ecological, economic, and institutional environment.

Table 1. Success factors of common resource governance, adaptive co-management, and adaptive governance. Source: re-elaborated from Wyborn (2015)

The ecological system that provides common resources (hereafter called “the common”) has clearly defined boundaries (Ostrom, 1990), and the common resources provided by the system are measurable (Dietz <i>et al.</i> , 2003).
The rules regarding the rights of appropriation of the common resources are adapted to the local context, and resources appropriation phenomena occur at a local scale (Armitage <i>et al.</i> , 2008).
Ad-hoc institutional arrangements allow most of the actors that can appropriate part of the common resources to participate in decision-making processes regarding the common (Ostrom, 1990).
The appropriators actively contribute to monitor the common resources and related processes (Ostrom, 1990).
Outsiders can be excluded at relatively low cost (Dietz <i>et al.</i> , 2003).
Graduated sanctions enforce the rules on resource appropriation (Ostrom, 1990).
Effective mechanisms and bridging organizations (Folke <i>et al.</i> , 2005) are activated to enable conflict resolution.
The self-determination of the local stakeholders is recognized by higher-level authorities (Ostrom, 1990).
Nested and multi-level enterprises and institutions participate in the governance of the common (Brondizio <i>et al.</i> , 2009).
People interested in the common have the opportunity to maintain face-to-face contact to foster trust and social capital (Dietz <i>et al.</i> , 2003).
The set of social actors with possibly converging interests in protecting the common is clearly identified (Chaffin <i>et al.</i> , 2014).
The local actors involved are provided with training and resources for capacity building (Wyborn, 2015).
A clear and legitimated leadership of the network governing the adaptive co-management initiatives is recognized (Hahn, 2011).
The common resource management processes and their outcomes are clear and accessible to the stakeholders thanks to system accountability and transparency (Porzecanski <i>et al.</i> , 2012).
Enforceable, effective, and sound regulatory frameworks exist (Porzecanski <i>et al.</i> , 2012).
The management authorities possess the ability, the human resources, and the autonomy to design organization, management and monitoring initiatives (Porzecanski <i>et al.</i> , 2012).
Opportunities are provided to foster cross-fertilization between different knowledge domains (e.g. biologists, law experts, and business owners) (Wyborn, 2015).
Social networks are employed to coordinate multiple adaptive management learning processes across levels of governance, and to recognize and shape the complex social system within which governance goals are set (Chaffin <i>et al.</i> , 2014).
Functioning social networks connect individuals and organizations across multiple levels and scales and strengthen the system transformability (Walker <i>et al.</i> , 2004), through the capacity of taking advantage of windows of opportunity for transitions towards an agreed-upon ecological vision (Olsson <i>et al.</i> , 2006).

Insights from the Austrian school: opportunity experimentation and institutional entrepreneurship as learning engines

Austrian economics is today recognized as the theoretical approach that provides the most suitable lenses to investigate the phenomenon of entrepreneurship (Shane and Venkataraman, 2000; Venkataraman, 1997).

The Austrian school, in fact, views economic phenomena as evolutionary and variance-driven, as opposed to the rational, planning-driven view of mainstream classical theories. Austrian scholars focus on the disruption of extant market equilibria as the core of entrepreneurial action. The

entrepreneur is the individual person (or team) that disrupts extant equilibria and explores new opportunities of creating value. This exploration is conducted boldly, with only partial or even erroneous information about its possible future development and outcome; therefore, entrepreneurship, by its very nature, is risky for the individual venture and destabilizing for the market, but it is the key force enabling economic development. To explain these phenomena, entrepreneurship scholars mainly refer to Schumpeter's concept of creative destruction (Schumpeter, 1934).

This view is very useful to distinguish entrepreneurship from strategic management as a field of studies. In fact, the Austrian approach invites an understanding of entrepreneurship as an exploratory trial-and-error process, whose main expected outcome is the economic progress of the society through the discovery, development, selection, and also failure and destruction, of new ways of creating value, i.e. new business models. Conversely, strategic management is commonly understood as a rational decision-making and planning process, whose main expected outcome is firm performance; in this case, failure is not viewed as a positive force. Of course, the two processes are reciprocally necessary to firm survival in the medium-long term, and therefore often coexist in the same organization. Business owners frequently oscillate between an entrepreneurial and a strategic management attitude; but, despite the close intertwining between these two approaches in practice, there is growing consensus that the theories usually adopted to explain strategic management are poorly equipped to explain entrepreneurship, and particularly the learning processes that are at the core of opportunity exploration.

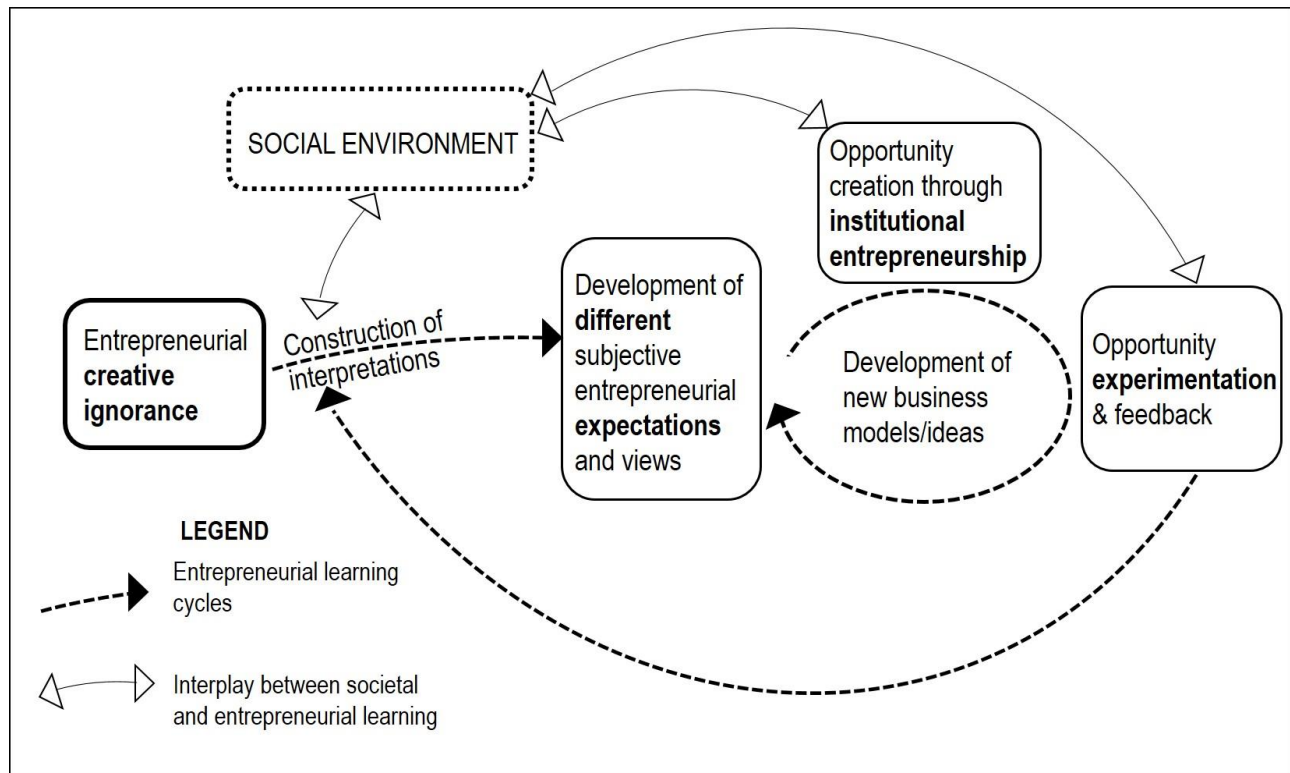
The Austrian view of entrepreneurship as an explorative, experimental process is highly compatible with the adaptive co-management approach described in the previous section. In fact, both adaptive co-management and Austrian disequilibrium entrepreneurship have been described as key processes to cope with a highly uncertain, unpredictable context. In this light, both adaptive co-management and disequilibrium entrepreneurship are explicitly conceived as possibly resulting in both success and failure, since failure may be necessary to develop knowledge for longer-term, higher-level benefit. This convergence makes the Austrian view particularly suitable to the goals of this study. However, the two most cited authors of the Austrian school, i.e. Schumpeter (1934) and Kirzner (1973), tend to overlook the role of the entrepreneur's social embeddedness. As a consequence, the entrepreneurship researchers that build upon Schumpeter and/or Kirzner tend to focus on the agency side of entrepreneurship, and garner criticism for having implied an under-socialized view of the entrepreneur (Shane, 2012).

For this reason, in order to develop a reference model of entrepreneurial learning in sustainable, place-based enterprises, this study refers to another Austrian scholar, Ludwig Lachmann. Although a central figure of the Austrian school, Lachmann has been much less cited than Schumpeter and Kirzner by entrepreneurship scholars so far. However, his contribution has been authoritatively described (Chiles *et al.*, 2007) as essential to understand how entrepreneurs create opportunities by actively participating in the processes of institutional transformation of their social environment (Lachmann, 1970).

Lachmann views entrepreneurs' *ignorance* as the key factor for value creation. In fact, ignorance leaves room for the radical subjectivity of the entrepreneurs' interpretations of the past and predictions of the future. Different entrepreneurs, in different cultural and social contexts, subjectively develop diverging expectations, and consequently concentrate on different perceived opportunities while developing highly differentiated business ideas (see Figure 1). The evolutionary role of entrepreneurial learning at the societal level depends on this differentiation (and the

subsequent selection) of entrepreneurial expectations and actions; in other words, ignorance-based divergence of entrepreneurial learning is a key force allowing economic progress in turbulent, unpredictable business environments (Lachmann, 1976).

Figure 1. An evolutionary model of embedded entrepreneurial learning, consistent with Lachmann's view. *Source: Authors.*



The analogies and differences between the Lachmannian entrepreneur and the adaptive manager described in the previous section are particularly interesting. Both the Lachmannian entrepreneur and the adaptive manager address the complexity of the world through experimentation (“let us see if this works”). On the other side, whilst the adaptive manager may purposefully “plan for failure”, leveraging science to gain knowledge on the ecological system, the entrepreneur is typically driven towards risky choices by unconscious cognitive mechanisms (such as counterfactual thinking, affect infusion, self-serving bias, or overconfidence) and/or social mechanisms (such as personal relationships, social influences, or institutional forces) (Mitchell *et al.*, 2002). These differences notwithstanding, both entrepreneurship and adaptive management experimentation result in intense learning that would have been impossible otherwise; as a consequence, new opportunities are possibly generated.

Lachmann's theory and the adaptive management approach also share the idea that the learning processes involving social actors are deeply embedded in the social structure. In order to explore new business opportunities, the Lachmannian entrepreneur needs that some norms, rules, values and beliefs are coherent and stable, while changes in certain other institutions may be needed. Therefore, entrepreneurs play an important and active role in the creation, stabilization and/or evolution of institutions. Contrary to the predictions of neo-institutional theory, the Lachmannian entrepreneur is a driving force behind institutional emergence and change (Lachmann, 1970). The recent literature

on institutional entrepreneurship (Dorado, 2005; Dorado, 2013; Garud, Hardy, and Maguire, 2007; Pacheco, York, Dean, and Sarasvathy, 2010; Tracey, Phillips, and Jarvis, 2011) is providing the first insights on how entrepreneurs respond to regulation (Deakins et al., 2016) also by actively contributing to the institutional fabric. For example, institutional entrepreneurs may influence the institutional environment by creating new symbols, advocating new values, theorizing problem and solutions, forging new relations, developing new standards, participating in policy-making or lobbying (see Figure 1). Studies on how institutional entrepreneurship may enable environmental sustainability are still few, but reflect a growing interest in this issue (e.g. Thompson, Herrmann, and Hekkert, 2014).

THE TORRE GUACETO CASE

Research design: integrating the adaptive management approach and Lachmann's view of embedded entrepreneurship

The literature review presented above reveals an opportunity to cross-fertilize the results of the adaptive management literature, on the one side, and Lachmann's view of entrepreneurship as an evolutionary, socially embedded process, on the other side. These two approaches are highly complementary. The adaptive management approach is particularly suited to identify and explain the *success factors* of participative, experimental, science-driven policy-making aimed at environmental sustainability. In turn, Lachmann's view is particularly suited to explain the *cycle* through which institutional work (i.e. the social co-creation of new rules and beliefs), entrepreneurial learning and societal learning co-evolve. The cross-fertilization between these two approaches may contribute to address the gap recently identified by the organization and management literature, i.e. the need to better understand the relationships between the health of businesses and the health of the local environments providing these businesses with crucial resources.

Since a cross-fertilization of these two views has never been conducted before, an exploratory study seems necessary. Qualitative, in-depth field research is particularly appropriate to address such a challenge (Bryman and Bell, 2011). Therefore, the research design entails the identification of a case in which the principles of adaptive management have been successfully applied to protect a fragile common, while providing local businesses with vital resources. This case will be explored to answer these questions:

1. In the case under analysis, does the entrepreneurial learning process follow the phases identified by Lachmann's view (see Figure 1)?
2. In the case under analysis, does entrepreneurial learning influence the processes of adaptive management of the common? If so, how?
3. In the case under analysis, do the adaptive management success factors (see Table1) influence entrepreneurial learning? If so, how?

Method

The Torre Guaceto MPA has been selected because it is internationally recognized as a pioneering, exemplary case of successful involvement of the local businesses in adaptive co-management (Guidetti *et al.*, 2010; Guidetti and Claudet, 2010; Guidetti *et al.*, 2008). The datasets and publications

resulting from the adaptive management process in Torre Guaceto provide a rich repository of longitudinal, high-quality secondary data. These data were triangulated with official reports, press reports, and ad-hoc interviews, following the classical guidelines of qualitative research (Bryman and Bell, 2011). About 50 interviews were conducted with the Torre Guaceto business owners, MPA managers, and scientists involved in the case. The interviews were conducted over a period of about one year between 2014 and 2015; twelve of these interviews were recorded and transcribed, whilst for the other, more informal interviews careful field notes were taken. The collected texts were elaborated through structured text analysis; the authors coded the texts for the key concepts included in the lines of Table 1 and the boxes of Figure 1, so to enable the analysis of the intertwined explanatory power of the adaptive management view and Lachmannian view of entrepreneurial learning.

Analysis

The Torre Guaceto MPA is in southeastern Italy, along the Adriatic coast. It was formally established in 1991, but the protection policies limiting fishing activities were not really enforced for several years. In the 1990s, the problems in effective enforcement and the subsequent increasingly serious damages suffered from the marine ecosystem of Torre Guaceto attracted the attention of important players such as the World Wide Fund for Nature (WWF) and Slow Food, an Italian association aimed at promoting the culture of high-quality, sustainable food. Thanks to the engagement and advocacy of these associations, the Torre Guaceto MPA was declared of national interest, i.e. a State Marine Reserve, in 2000.

The new MPA management immediately imposed a complete ban on fishing activities in the whole MPA area. This time, the enforcement was effective due to the strong commitment of the new MPA management, MPA staff, and police forces. This situation immediately resulted in strong hostility from local fishermen. Torre Guaceto is a small town whose economy is based on small, traditional businesses and tourism. The local artisanal fishing enterprises had a well-established role in the social fabric of the community and in local identity. Fishing outside the MPA area was not sufficient to provide Torre Guaceto fishermen with adequate profits.

A period of social tensions began. The fishermen did not trust the warnings of the scientists and MPA managers about the serious risks of irreversible ecological collapse threatening the local marine ecosystem, and were not willing to accept the ban. During the interviews, one of the fishermen said, *“When fishing was banned, we were really very, very, very angry.”* Another fisherman reported, *“We were skeptical about all they said. We just didn’t believe them [the MPA managers].”*

Many fishermen repeatedly tried to fish illegally (i.e. poach) in the MPA. Some people even tried to launch anonymous, threatening messages to the MPA managers. During our interviews, one of the MPA managers reported, *“I found my car tires cut twice.... They also purposefully damaged my colleagues’ cars.”* Another manager reported, *“In the first place, our relationships with the fishermen were really bad. It was just like a cops and robbers game.... At night they used to go poaching. They just had no intention to stop.”*

A team of scientists from Italian universities were involved to study the Torre Guaceto MPA and to provide the MPA management with information about the conditions of the marine ecosystem. Unfortunately, the points of view of the scientists on the one side and the fishermen on the other side were perceived as completely incompatible by the local community. The MPA managers became

convinced that this hostility would jeopardize the success of the whole initiative. Therefore, they adopted the principles of adaptive co-management, described above, and organized a meeting with the scientists and the fishermen.

In this meeting, held in 2002, the scientists illustrated to the fishermen the serious fragility of the ecosystem. They clearly stated their confidence that, thanks to the ban, the ecosystem was starting to recover; they estimated that in 2005 it would be possible to partially remove the fishing ban. They said that a moderate artisanal fishing, strictly monitored by the MPA, might then be compatible with the protection of the ecosystem. They asked the fishermen's collaboration in order to establish a fishing protocol while waiting for 2005. The fishermen were proposed to accept "experimental fishing": they would fish strictly following the scientists' directions, both inside and outside the MPA, and carefully report their catches. In this way, the fishermen would become a key part of the MPA monitoring process. The fishermen were also reassured that no other fisherman would be allowed to enter the MPA, and that the MPA targeted the stabilization of the fish stock so that internal competition among the fishermen involved in experimental fishing would be unnecessary. The fishermen accepted; the MPA offered them a sum of money as a partial refund for the lost profits due to the ban.

The fishing protocol (including the number of fishing boats allowed, the frequency of catches, the type of net allowed, etc.) was agreed upon through negotiation between the scientists' proposals (based on pilot studies) and the fishermen's traditions and opinions. As one of the MPA managers pointed out: *"It was essential to explain to the fishermen the importance of their contribution. Their foresight was important in defining the common rules."* The parties agreed that the protocol was experimental and could be changed if the feedback from marine monitoring requested it. The fishermen who accepted to participate in experimental fishing founded the Community of Torre Guaceto Fishermen.

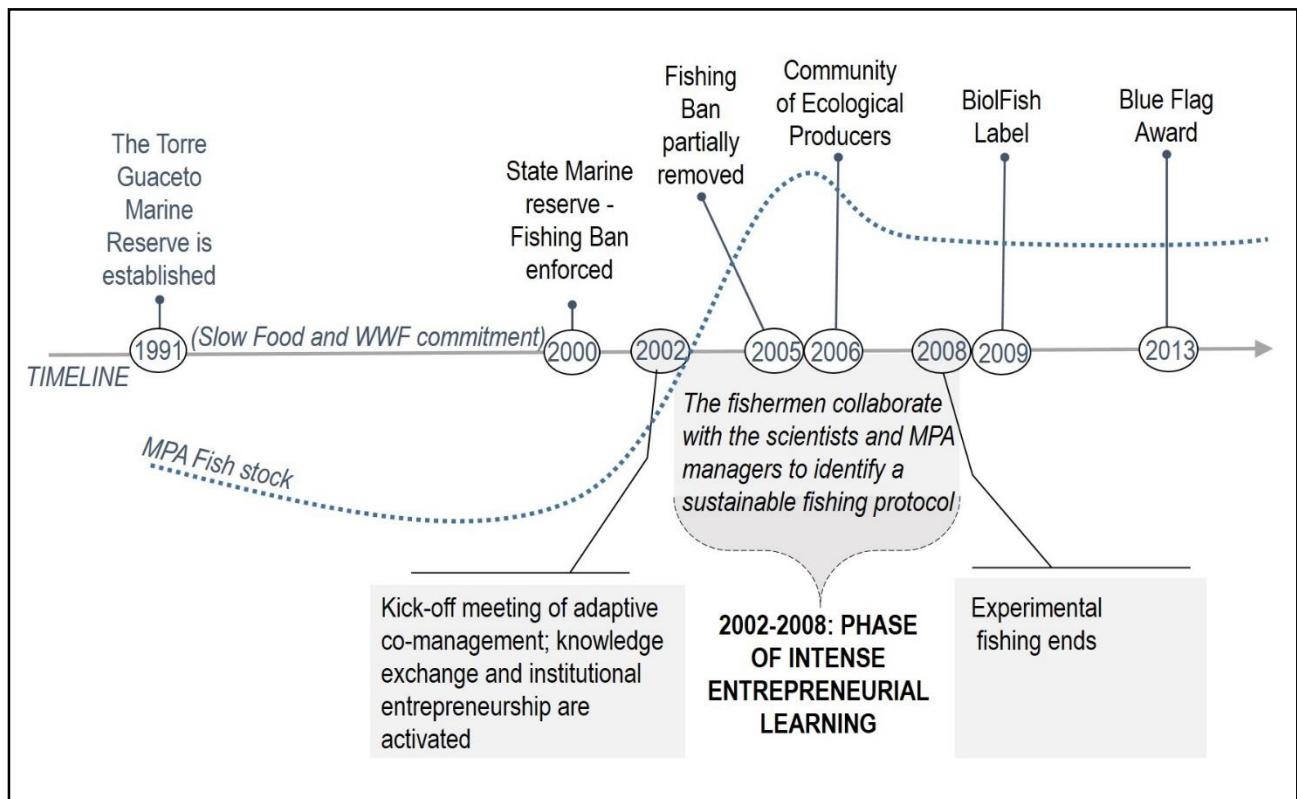
In 2005, the fishing ban was partially removed, and the fishermen were allowed to fish in a sector of the MPA, while another sector of the MPA remained a no-take area to allow fish reproduction and the total protection of the environment. *"The first catches were biblical!"* a fisherman reported. The quantity of fish exceeded 400% of what was usually caught before the ban, and also the fish size was bigger, which permitted the fishermen to sell fish at a higher prize.

The experimental fishing started in January 2005. The fishermen were asked to fish both inside and outside the MPA, using the same equipment and following the directions of the scientists, in order to compare the catches. They carefully collected data on their own positioning and actions, and data on the quantity and type of fish, providing the scientists with the results. Bi-monthly meetings with the fishermen, MPA managers, and scientists were organized to discuss the progress of the experiment.

Data were longitudinally collected and analyzed for four years, 2005-2008. After the ban removal, the amount of fish declined. In 2007, the fish stock in the MPA stabilized: catches inside the MPA were twice as abundant as those outside the MPA. The scientists accepted this equilibrium as sustainable. The fishermen were satisfied. One noted: *"It's difficult when they ban you from a fishing area, but in the end the results arrived."* Another enthused: *"My life has changed since I started with this experimental fishing. Now I am sure to make a living: my catches are much more abundant than those of the other fishermen that fish outside the protected area.... The fish are big here, and there is no pollution."* Others reported: *"The fish reproduce in the Reserve, and there is a spillover in the surrounding areas."* *"On average, we take 50-60 kg of fish in just one night... enough for a week's work!"* Another one said: *"Today, we can ensure a future for our children, and many young people*

are interested in our work and want to become fishermen.”

Figure 2. The longitudinal evolution of the Torre Guaceto case: adaptive co-management and entrepreneurial learning. *Source: Authors.*



The fishermen became MPA rangers, and their collaboration and surveillance proved very effective: poaching records decreased by 90% in a few years. During the interviews, one of the fishermen said: *“The benefits are so great that we would like to extend the protocol to all fishing areas!”*

In 2006, the Community of Organic Producers and Fishermen of the Reserve of Torre Guaceto was established. This association fully embraced sustainability principles in connection with the fishing protocol.

In 2009, the fish of Torre Guaceto received the international “BiolFish” label (the first and only in Italy). The BiolFish label is certification of the quality of the fish and sustainability of the fishing activities. The motivation report includes the following: *“[the BiolFish label is given] for the contribution to the safeguard of an activity of artisan fishing characterized by the recovery of local traditions and respect of the principles of sustainability; for the choice of fishing activities in the respect of a volunteer sustainable protocol.”*

In 2013, the Community of Fishermen of Torre Guaceto was awarded with the United Nations’ Blue Flag with the following motivation: *“for their active commitment in the guardianship of the sea and valuable contribution to the sustainable development of fishing.”* Notably, this is the first case in which a community, instead of a place, was awarded with the UN Blue Flag.

Figure 2 synthesizes the longitudinal evolution of the Torre Guaceto case.

DISCUSSION

The Torre Guaceto experience can be viewed as an exemplary case of a network of place-based enterprises aimed at both environmental and economic sustainability. In this case, the network of place-based enterprises (operating in the sectors of fishing and tourism) creates value through the strict collaboration with the MPA management and a network of academic researchers interested in environmental protection, marine biology, and SES resilience. The MPA management bridges the two networks (businesses and scholars) and respective knowledge domains, promotes the adaptive co-management of the common natural resources at stake, and enforces the rules of the game. Therefore, the network of place-based enterprises, the network of university researchers, and the MPA management can be holistically viewed as an integrated, knowledge-intensive, place-based *network organization* aimed at SES prosperity and resilience through the sustainable exploitation of a local common.

The analysis of the case confirms that both adaptive management and entrepreneurial learning have been crucial to the success of this network organization. More specifically, the analysis provided the following answers to the questions identified in the research design phase:

1. In the Torre Guaceto case, the entrepreneurial learning processes did follow the phases identified by Lachmann's view (see Figure 1), as synthesized below.
2. In the Torre Guaceto case, entrepreneurial learning did influence the process of adaptive management of the common in several ways, in all the phases of the process, as synthesized below.
3. In the Torre Guaceto case, the adaptive management success factors (see Table 1) did influence entrepreneurial learning in several ways, in all the phases of the processes, as synthesized below.

In fact, the analysis of the Torre Guaceto case allowed the authors to cluster the observed learning processes around six phases. The following section offers a synthetic description of these six phases, and of their antecedents and results. The description of each phase highlights the role of the adaptive co-management success factors (see Table 1) and the pivotal role of entrepreneurial learning in dynamizing organizational and societal learning, consistently with Lachmann's view (see Figure 1).

First phase: backward-looking ignorance (pre-lachmannian phase: entrepreneurial learning impossible). When the no-take zone of the marine protected area was enforced in 2000, the fishermen (i.e. the place-based enterprises under analysis) actually refused to take into consideration that the no-take zone could be an opportunity. They did not think that the new policy could positively affect the fish stock, their profits, and the very survival of their enterprises in the middle and long term. This ignorance about the factors actually affecting their businesses' sustainability could not possibly be amended by simple top-down educational initiatives, since the fishermen did not trust the biologists. As the interviews clearly show, they perceived the scientists involved in the Torre Guaceto marine reserve as intruders with hostile interests; they thought that the scientists were not interested in the concrete problems of the local economy, and that they could lie about the impact of the new policy in order to gain legitimacy for their studies. Having lived for many years a tragedy-of-the-commons situation, the fishermen had developed cognitive habits leading them to assume that opportunism and appropriation were the sole possible explanations of the other actors' behaviors. The progressive decline of the fish stock that the fishermen had witnessed in the previous years had resulted in a fatalist culture and in the deeply ingrained idea that depleting the marine area as much as possible,

before the others did the same, was the only thing to do. For these reasons, knowledge exchange between the fishermen and the experts involved in the Torre Guaceto marine reserve was impossible in the first place. In this phase, the ignorance of the fishermen was not the positively empty space, available for developing original entrepreneurial expectations, described by Lachmann; on the contrary, the fishermen's ignorance was a backward-looking force that hindered the perception of the emerging opportunities, thus disabling the very basic mechanisms of entrepreneurial learning.

Second phase: window of opportunity to develop adaptive innovation (corresponds to Lachmann's entrepreneurial creative ignorance; see Figure 1). The enforcement of the no-take zone in 2000-2001 resulted in a cultural shock for the fishermen. Officially, restrictions to fishing had been established several years before, but, as the historical records clearly demonstrate, the policies had not been really enforced that far. Hence, each fisherman was used to considering the fishing policies as abstract, formal rules that he had the right to violate; in fact, in any case, the other fishermen would do the same, so a single fisherman's compliance would have been useless and stupid. No one wants to feel stupid in the face of opportunists; thus, people often tend to reject as false those warnings that predict the negative consequences of an opportunist behavior and invite to renounce it. This is the typical cognitive trap that makes people deaf even to the most reasonable warnings, and drags an SES into the tragedy of the commons. The vigorous enforcement of the no-take area (enforcement is a key success factor in adaptive management, see Table 1) after the year 2000 had the effect of breaking this cognitive trap. Illegal fishing became actually very difficult: all the collected interviews agree on this. As a consequence, each fisherman started to realize that also the other fishermen were forced not to catch in the protected area. This progressively alleviated the sense of reciprocal rivalry that had hindered the fishermen from every form of collaborative attitude and open-mindedness that far. The Torre Guaceto fishermen started to perceive that they had converging interests, and that joining their forces to defend these interests would have been wiser. This new mind-set eventually resulted in the foundation of the local community of fishermen. In addition, the new situation forced the fishermen to admit that they did need to find another way of doing business. This thirst for new business models is the very core of the forward-looking entrepreneurial ignorance described by Lachmann as the source of entrepreneurial learning. Meanwhile, the effectiveness of the enforcement of the no-take zone had made the management of the MPA management credible. These two factors (entrepreneurial ignorance of the fishermen, and credibility of the MPA management) created a situation that, in the light of the literature on adaptive management, can be described as a window of opportunity.

Third phase: the adaptive learning cycle is activated (corresponds to Lachmann's development of different subjective entrepreneurial expectations and views; see Figure 1). The MPA management and the scientists involved in the protection of the marine area believed in the principles of adaptive co-management and attached importance to the success factors identified by this approach (see Table 1). Therefore, they decided to exploit the window of opportunity opened by the socio-cognitive processes of the second phase, by convening a meeting with the community of the fishermen in 2002. This meeting was a turning point. Based on the interviews and reports collected for this study, it was possible to reconstruct what happened during this meeting. The MPA managers showed respect for the cultural identity of the fishermen and for their role in the local society and economy. They confirmed that the suspension of the fishing activities was resulting in encouraging changes in the marine ecosystem, and that they were confident that the fishing could partially restart a few years later. They asked the fishermen to collaborate in establishing the policies that would rule fishing after the end of the fishing ban, and they offered them some money as a partial contribution to face the economic difficulties resulting from the ban. These proposals changed the fishermen's perceptions about the MPA management and the scientific team involved in the Torre Guaceto marine reserve.

The new climate of inter-personal trust across the network enabled the gradual construction of new entrepreneurial expectations. The fishermen understood that, if they accepted the engagement proposed by the MPA management, this would yield them the valuable option to be the sole fishermen allowed to catch in a possibly rich fishing area, where competition among authorized fishermen would no longer be needed.

Fourth phase: agreements for adaptive co-management (corresponds to Lachmann's opportunity creation through institutional entrepreneurship; see Figure 1). In the years between 2002 and 2005, the fishermen actively participated in the creation of the new institutional conditions that would enable a new business model, based on environmentally sustainable fishing. The actors involved in the emerging network organization (fishermen, MPA management, and scientists) agreed that the common task was to find a way to stabilize catches at a level that could be satisfying for the fishermen, while not jeopardizing the marine ecological system. In this phase, a knowledge-intensive cooperation started: the scientists shared their expertise on the ecological aspects influencing fishing sustainability (e.g. protection of habitat formers, juvenile stages, and key predators), and the fishermen shared their artisanal, place-based expertise and culture. The scientists frankly admitted that there was no scientific evidence enabling the *a priori* identification of the exact fishing equipment and practices that would allow really sustainable fishing in that specific marine area. Therefore, it was necessary to consider fishing not only as a way to make money, but also a learning process, i.e. a way to monitor the environment. The shared knowledge of the network organization was leveraged to negotiate a fishing protocol (maximum one catch per week, maximum four boats, type of net, etc.) that was acceptable for all the parties. The fishermen agreed to possibly further reduce their fishing effort in the protected area or change the gear used (e.g. using nets with larger mesh), in case negative effects of the adopted protocol were detected. This agreement enabled the creation of a potentially virtuous cycle between creative, future-oriented ignorance and experimentation; this virtuous cycle is at the core of both the adaptive management approach and Lachmann's view of entrepreneurship. Therefore, this case confirms that institutional entrepreneurship may be an essential factor of entrepreneurial learning.

Fifth phase: policy experimentation and adaptation (corresponds to Lachmann's opportunity experimentation and feedback; see Figure 1). Based on the results of scientific monitoring, the MPA management decided to remove the fishing ban in the buffer area in 2005. As reported in the case analysis section, the first catches yielded spectacular results in terms of quantity and quality of fish. This tangible feedback excited the fishermen, as all the interviews confirm. They felt really engaged in protecting the marine area. They soon realized that one catch per week was sufficient to make profits, whilst before the ban they had to fish every day. They utilized the time freed by the dramatically increased abundance of fish to work as MPA rangers. In this phase, the existence of a real network organization comprised of fishermen, MPA management, and scientists became apparent. In the following months, the participation of the fishermen in the collection of scientific data made them aware that their fishing activities were actually resulting in a new decline of marine biomass. When the catches stabilized in 2007-2008 (twice as abundant as outside the protected area), this was perceived as a common success. On the other hand, the fishermen had become aware that the ecosystem was really complex and fragile and that science-based data collection and elaboration were indefinitely necessary to guarantee the sustainability of their new business model. Fishing had become a knowledge-intensive enterprise.

Sixth phase: social legitimization of the adaptive change occurred (corresponds to Lachmann's interplay between entrepreneurial and societal learning; see Figure 1). The social legitimization of the Torre Guaceto model (awards and eco-labels) further reinforced the business model. The success of

the new business model triggered a change of mentality in the local community. New businesses, based on sustainable tourism, were launched. The scientists involved in the Torre Guaceto adaptive management process published their results in prestigious international journals, and the case raised international interest. Given all these circumstances, it is not surprising that real entrepreneurial pride is clearly perceivable in the contents of the interviews conducted for this study. The fishermen are today promoters and teachers of the values and methods of sustainable development in their local community and in their relationships with the tourists.

Conclusions

Despite the predictions provided by the strong scholarly tradition rooted in the RBV and in strategic management, in some cases the pursuit of competitive advantage is unnecessary, or even harmful, to the development of new and successful business models. The tragedy of the commons is an important case in point. The paramount societal, demographic, and ecological challenges facing humanity call for a new role of entrepreneurial learning, which should be aimed also at the collaborative development of a new generation of business models, based on the smart, sustainable, and adaptive co-management of critical common resources.

This study contributes to exploring this relevant but under-investigated issue. The development of the original six-phase model provides novel insights on how adaptive, embedded entrepreneurial learning successfully unfolds in place-based enterprises whose survival depends on a local common. In order to backbone the proposed model, this study integrates two theoretical views that, to the best of the authors' knowledge, have never been cross-fertilized before (Lachmann's view of entrepreneurship and adaptive management), and whose potential has been overlooked by organization and management studies so far.

The six-phase model was developed through a longitudinal case study, which also allowed the exploration of the joint explanatory power of the adaptive management and Lachmannian views. The results are encouraging, and pave the way to further research steps in at least four lines of inquiry: entrepreneurial learning, institutional work, network organizations, and adaptive co-management.

The novel interdisciplinary approach proposed by this study may also have relevant implications for practice. In fact, it is today widely recognized that ecosystems' resilience must be protected, even in densely populated areas; this almost always implies the innovation of place-based enterprises' business models, in order to allow the local communities to develop specific, prosperous, *and* sustainable regional economies. This transition, however, is a stony, tricky path, with the tragedy of the commons always lurking around every corner. When the stakeholders involved in this transition start interacting, they usually have completely opposing perceived interests and they tend to consider power games and conflict as the sole possible relational approaches. In addition, can rely on poor, if any, mechanisms for reciprocal understanding, coordination, and integration. If people do not have effective tools to address these issues, this situation often results in a vicious cycle, which may be very difficult to break.

It is not surprising, then, that many attempts to develop a participated transition of place-based enterprises to sustainability end up failing (Allen and Gunderson, 2011). The sustainable development of an eco-socio-technical system requires complex and flexible protocols to drive the organizing, monitoring, and managing activities that are relevant to the system's resilience; but these protocols, despite their potential usefulness, are still missing.

The six-phase model of entrepreneurial learning proposed by this study may help address this gap. These results, in fact, may serve as a basis to develop a comprehensive maturity model of sustainable place-based entrepreneurship. This maturity model may allow the definition of specific protocols to support managers, entrepreneurs, and scientists involved in the complex transitions requested by adaptive co-management projects.

Despite this model's promise, this study has limitations, and further researches are needed before transforming the six-phase model of entrepreneurial learning into a normative support for practice. In fact, this study relies on a single, explorative case study, although carefully selected. A larger-scale qualitative comparative analysis, on the one side, and quantitative data collection and testing, on the other side, could be interesting goals for further research steps, and would provide sound bases for the build-up of useful maturity models and protocols for practice.

These limitations notwithstanding, this study encourages the cross-disciplinary approach to entrepreneurship, institutional design, and governance of common resources that is much needed in today's scenario. In the authors' opinion, this study highlights the importance of overcoming the boundaries between business sciences, behavior sciences, political sciences, and natural sciences, in order to develop a genuinely inter-disciplinary stream of studies on the transition of eco-socio-technical systems towards sustainability and resilience.

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