"Adaptive business arrangements and the creation of social capital: towards small-scale fisheries resilience in different European geographical areas"

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Abstract: European small-scale fisheries are confronted with several challenges, notably a decrease in the number of people engaged in capture fishing, growing competition from less expensive extra-EU markets, rising operational costs, strict regulations and the depletion of fishing stocks. Many small-scale fishers must adapt to change to maintain or increase their income using different business strategies. In this respect, we argue that new and diversified institutional arrangements combined with building social capital can help reach long-term economic sustainability for small-scale fisheries businesses, as well as the social-ecological resilience of coastal areas. In order to understand and analyse the multiplicity of strategies applied by small-scale fishers - including expansion towards non–productivist activities - this paper examines the role of new institutional arrangements based on small-scale, traditional, quality-orientated, multifunctional business strategies, as well as non-fishing activities. Using a case study approach, we analyse - in three different European fishery contexts (Greece, Italy, and the UK respectively) - how the interplay between building adaptive arrangements and the creation of social capital in selected small-scale fisheries provides relevant prerequisites for resilience.

Keywords: Small-scale fisheries resilience, Primary producers, Sustainable management, Non-productivism, Institutional arrangements, Social capital, New business models.

1. Introduction

The drastic reduction of fish stocks in global marine waters is associated with concurrent overfishing, in addition to climate change, ocean acidification, and eutrophication. In the European Union's (EU) marine waters, it is still unclear what action needs to be taken to reduce the fishing effort. On the one hand, policy efforts aimed at reducing stock depletion seem not to have had much success; some authors attribute this to the design of the Common Fisheries Policy, to implementation deficiencies and inconsistencies (Veiga et al, 2015; Lizaso et al., 2020). In fact, despite multiple efforts and interventions, the state of marine fish stocks has not improved in the EU with 40 per cent of stocks still being fished beyond their Maximum Sustainable Yield (Salomon et al., 2014). On the other hand, recent studies (e.g. Sumaila and Bellman, 2016; Froese et al., 2018) demonstrate that within EU waters the reconstitution and growth of fish stocks might be achieved within a few years, with a positive impact for the economic viability of the fishing sector. Also, considerable differences exist between fishing regions of the EU. For example, stocks in the Northeast Atlantic and the Baltic Sea present healthier state and more sustainable exploitation than stocks in the Mediterranean and the Black Seas (European Environment Agency, 2020). Moreover, there are also inconsistencies with regards to assessment methods (Lizaso et al., 2020) and data availability on fish stocks, as well as a strong diversity of biological and economic contexts for evaluation (Lleonart, 2003; Froese et al., 2018), increasing the level of uncertainty in which fishers carry out their activities. Within this general context, small-scale fishery businesses (i.e. 80 per cent of the active fishing vessels in the EU according to Stobberup et al., 2017) are particularly vulnerable and disinclined to adapt to change for a number of reasons. In fact, they socially and economically rely upon the fish resource (Marshall et al., 2007). However, various contradictory interests impact policy decisions (Coulthard et al., 2011), with evolving regulatory frameworks affecting fishing quotas and catches (Schaffer, 2016). The increasing globalisation and technological innovation of food systems, changing food consumption patterns and environmental restrictions are also disturbing small fisheries' economic activities (Camarinha-Matos et al., 2010). In addition, fishers are the weakest economic actor in the

value chain as little or no control and influence over pricing because they often depend upon intermediaries and middlemen before reaching the final consumers (Penca et al., 2021). Furthermore, European small-scale fisheries are confronted with a steep decline in the number of people engaged in capture fishing (FAO, 2016), growing competition from less expensive extra-EU markets (Crona et al., 2016), rising operational costs, and strict regulations (Higgins et al., 2008; Cardinale et al., 2013; Urquhart et al., 2014). Hence, small-scale fishers are increasingly confronted with several uncertain conditions and, consequently, the livelihoods and economic welfare of the small fishing communities in the EU are strongly impacted (Schaffer, 2016).

Many small-scale fishers in the EU are therefore striving to maintain, or increase, their income using a range of business arrangements; in this respect, direct marketing arrangements can enhance the ex-vessel value of seafood as well as the profitability of small-scale fishers, through bypassing fish traders and capturing more of the value added obtained from the premium prices paid by customers who recognise the value of locally caught fish (Prosperi et al., 2019). These trends can be deemed in part as the effects of the European Commission Blue Economy strategy, but in particular they are also explained by the initiatives supported by European Maritime and Fisheries Fund (EMFF), through the Union Priority 4 (UP4) financial tool that aimed at improving value added creation for local fish products, diversifying fisheries activities through multifunctionality, promoting socio-cultural aspects and cultural heritage, investing in environmentally friendly fisheries operations, and strengthening fishing communities through enhanced forms of governance (Miret-Pastor et al., 2020).

However, in these conditions the nature of the fishing business tends to change (Olson 2011). Small-scale fishers are confronted with new constraints and opportunities to interact with supply chain actors - such as other fishers, consumers, restaurants, wholesale buyers and retailers – and are embedded in complex, dynamic, and multiple networks of supply and trade that link production to

consumption, involving value-adding processes (Jacinto and Pomeroy, 2011). Such market channels' diversification can bring to increasing business income, and can be combined with other diversification strategies such as offering tourism services, or adding value to their catch through food processing, or by improving their environmental performance and pursue certification, thus promoting producer reputation, while maintaining fishers' occupational status. The diversification of productive activities can, therefore, help achieve long-term economic sustainability for fisheries businesses, as well as the social-ecological resilience of coastal areas (Roussel et al., 2011; Ropars-Collet et al., 2017). Diversified business activities – such as rural activities that detach economic gain from primary production (Marsden and Sonnino, 2008) and contribute to the management of landscape and natural resources and viability of rural areas (Renting et al., 2009) - can be considered as multifunctional practices that bring adaptation capacity (for instance in fisheries) in the form of 'non-productivist' patterns of activities (Prosperi et al., 2019). Fishers engaged in non-productivist activities are still engaged in catching fish, but the emphasis on quantity is reduced and there is a greater focus on the qualities of the fish being caught. These qualities may be in terms of the intrinsic quality of the fish involved, or the social, environmental or cultural context within which the fish was caught.

Analysing the practices and strategies of small-scale fisheries through a non-productivist framework can also help to improve the understanding of their resilience and thereby sustainability (Salmi, 2015). Building on the analysis of the multiplicity of strategies applied by fishers' through non–productivist activities - such as small-scale, traditional, quality orientated, multifunctional as well as non-fishing activities - this paper aims to improve knowledge and understanding of the impact that the development of non-productivist business arrangements, intertwined with social capital creation, may have on economic viability of small-scale fisheries and resilience of the social-ecological systems to inform fisheries policy and economic opportunity in a EU market and regulatory context of uncertainty and changing conditions for fisheries. In the next chapter we

develop a conceptual framework that will contribute to illustrate the empirical results obtained in three different areas of small-scale fisheries in the EU. The description of our methodological approach for the three case studies will be followed by the presentation and discussion of our findings and comparative analysis from the three fishing areas in the UK (Cornwall), Greece (Kavala), and Italy (Tuscany).

2. Non-productivist institutional arrangements, social capital creation, and the social-ecological resilience of fisheries: an integrated framework

Non-productivist pathways in fisheries are characterised by practices that deepen traditional production systems and are usually relatively extensive, often making a direct contribution to multifunctionality (Wilson and Burton, 2015). Non-productivist strategies are rooted in the concept of non-productivism and in the economics of multifunctionality. The concept of multifunctionality applies to fisheries, agriculture, and forestry, as they are economic activities that produce marketable goods and services, as well as non-marketable or non-commodity outputs to society and the economy by means of environmental and socio-economic benefits (Hediger, 2006; Ferrari and Rambonilaza, 2009). More specifically, multifunctionality refers to the use of land, capital, labour and knowledge for directly and indirectly producing environmental and socio-economic non-commodity benefits – such as food security, rural employment, habitat and landscape protection, cultural heritage, etc. – being tightly associated with efficient resource allocation that is a key prerequisite for sustainable development (Hediger, 2006; Caron et al., 2008; Hediger and Knickel, 2009). Non-productivist activities in fisheries involve catching fish but – beyond the quantities caught – there is a greater emphasis on the intrinsic quality of the fish products, as well as on the characteristics of the social, environmental, or cultural context within which the fishing activity is embedded.

Non-productivist strategies involve particular institutional arrangements that represent promising new strategies for small-scale fishers as they attempt to reposition and reconnect themselves, as both producers, dealers, members of collective organisations, environmental actors, and tourism managers, in crowded and often highly competitive markets and in depleted marine systems. In this respect, building on van der Ploeg et al. (2008, p.10), "*institutional arrangements can* […] *be understood as structures and mechanisms of social configuration and cooperation,* […] *regulations, laws, norms or traditions that are shaped through human interactions* […] *manifested in an organisational structure* […]*, produced by collective human choice".* More specifically, van der Ploeg et al. (2008) explain that institutional arrangements are built and carried out through social self-organisation dynamics that go beyond individual conscious interests, and in rural development they represent organisational tools for facilitating and overcoming the limitations to coordination between actors. New institutional arrangements that are characterised by non-productivist activities, lead to new forms of connections and collaborative relationships with other actors - directly or indirectly involved in the fish value chain or related to other sectors (e.g. tourism, food processing, environment protection, etc.) – that represent a set of socioeconomic practices that can be characterised as "non-productivist arrangements" (Doeksen and Symes, 2015; Prosperi et al. 2019). Moreover, connections between actors are in large part based on the development of social capital. In fisheries studies, social capital has been acknowledged as a key "*dynamic, multi-dimensional and relational*" factor to collectively enable sustainable fisheries management, as fishery resources are common goods (Schaffer, 2016; p.39). Social capital can be understood as "*the ability to get things done collectively"*, which means that it represents *"a co-operative way of getting things done and is embodied in the ability of individuals, groups, organisations and institutions to engage in networks, to co-operate, to employ and use social relations for a common purpose and benefit"* (van der Ploeg et al., 2008, p.10). In brief, social capital allows actors (such as individuals, groups, enterprises, and organisations) to reach their objectives through building on the relationships that exist between them.

Social interaction and collective resource management with the engagement of fishery stakeholders is strongly required for designing and implementing changes in policies and regulation (Schaffer, 2016). Staying connected with effective networks and mobilising skills, knowledge, and resources within social and economic contexts, allows for enhanced resilience opportunities, while the lack of interaction within networks can result in a loss of fishers' capacity to implement collective skills, knowledge, resources, and to adapt to changing conditions (Brooks, 2010). It is also acknowledged that the existence of multifaceted levels of social capital creation (i.e. bonding, bridging, linking social capital), within institutional arrangements in fisheries, can contribute to an appropriate balance of social capital for more suitable adaptations to changing and emerging market and regulatory challenges (Woolcock, 1998). Therefore, social capital consists of practices of individuals or groups engaging in networks that, through social relations, enable collaboration and collective action for a common purpose (Rydin and Holman, 2004; van der Ploeg et al. 2008). There are three main types of social capital dynamics identified in the literature: a) bonding social capital, which refers to social relations within a specific community that entail tight and homogeneous collective interactions, such as cooperation; b) bridging social capital, which enables interactions between different communities, such as connections between heterogeneous groups, allowing for knowledge diffusion and innovation; and c) linking social capital, which refers to cross-scale connections, such as interactions between communities and political and financial stakeholders and decision-makers (Grafton, 2005; Brooks, 2010). The co-existence within a community of a diversity of social capital dynamics is important for increasing the adaptability of a community to face emerging challenges (Schaffer, 2016). A functioning social capital encourages participation and creates trust, whereby people invest resources into collective action for improving the sustainable management of common resources (Pretty, 2003).

In a nutshell, researching the relation between fisheries' engagement in new institutional arrangements and related social capital creation can provide valuable insights to the ways in which small-scale fishers engage with market, state, and civil society actors to strengthen their position in negotiations and decisions over access to resources, as well as the larger social-ecological resilience of fisheries. The resilience concept has been largely adopted in social sciences (Berkes et al., 2003) and recently adapted also in fisheries studies by a number of scholars (Doeksen and Symes, 2015; Phillipson et al., 2015; Salmi, 2015). The concept of ecosystem resilience originates from Holling (1973) and has been adapted by Walker et al. (2004) to social-ecological systems as "*the capacity of a system to absorb disturbances, to be changed and reorganised*". Resilience is also understood as a crucial dimension of long-term sustainability (Alm s and Campbell, 2012) since it is an operational concept that provides information to feed into the decision process on sustainability (Allen and Prosperi, 2016). From an operational perspective for fisheries studies, resilience thinking contributes to a deep and articulated analysis of the different adaptation strategies that small-scale fisheries can put in practice in response to the diversity of challenges affecting their economic activity (Salmi, 2015). In this respect, previous studies have also demonstrated the key role of a multiple strategy approach, detached from the primary production, for economic activities in rural areas, in contributing to landscape and natural resource management, as well as to the socio-economic viability and welfare of rural areas (Marsden and Sonnino, 2008; Renting et al., 2009). As such, following Salmi (2015) who highlighted the importance of a "non-productivist" development for the future resilience of small-scale fisheries, Prosperi et al. (2019) demonstrated how diversified activities of small-scale fisheries can be considered as multifunctional practices that enhance the adaption capacity of fisheries through non-productivist patterns of activities. Specifically, in relation to this research, the social-ecological resilience of small-scale fisheries is deemed as their ability to use biophysical, financial, institutional, and social assets in order to cope with challenges and to seize opportunities that enable their long-term economic sustainability, as well as the sustainability of the natural environment in which small-scale fisheries act. Institutions also contribute to develop these

dynamics. In fact, previous researches from authors such as Davoudi (2012) and Symes et al. (2015), demonstrated the crucial role that Fisheries Local Action Groups (FLAGs) - Axis 4 of the European Fisheries Fund (EFF) 2007–2013 - have on these challenges "*in activating local responses that build resilience and adaptability within the fisheries sector and the wider community*" (Phillipson and Symes, 2015, p. 344). In particular, the role of FLAGs can be deemed as particularly important as these initiatives allowed to enlarge the EFF vision from the narrow perspective on fisheries economic sector to a larger angle that takes into account territorial aspects and needs of local fisheries communities, and that provides policy design with evidence-based knowledge on vulnerabilities and resilience opportunities from the economic and social benefits of sustainable fisheries (Phillipson and Symes, 2015).

The challenges for small-scale fisheries that have been introduced so far raise a number of questions about how adaptive and non-productivist strategies enable new institutional arrangements, as well as on how these new forms of coordination between actors lead to the development of social capital, or how social capital increase can bring to new forms of coordination. The general question is therefore to understand how the interplay between non-productionist adaptive arrangements and social capital creation impacts fisheries' long-term economic viability and the resilience of the social-ecological systems. In arguing in this paper that the development of new institutional and non-productivist arrangements is likely to improve fishers' position in the value chain, strengthen mutual trust as well as increase and enhance fishers' relationships with other actors, we assume that these connections, in large part based on the development of social capital, are both outcomes and causal factors of new business arrangements. Investigating the potential for building and drawing upon social capital to support fishery and industry sustainability, will contribute to an understanding of the influence social capital may have on the long-term economic viability and resilience of the social-ecological systems, thereby informing fisheries policy. Using a case study approach, the theoretical bases of the economics of multifunctionality, social capital, and resilience thinking were applied,

since - building on Olsson et al., 2004 - the authors recognise the interdependence and co-evolution of the first two processes, namely the adoption of non-productivist institutional arrangements and the creation of social capital and, in turn, their high relevance as prerequisites for resilience. Building on this theoretical reflection, we develop an integrated framework to explain how the interaction between non-productive arrangements and social capital creation can bring to the social-ecological resilience of small-scale fisheries. In order to achieve our aims we refer to the conceptual framework developed by Stoll with other scholars (Stoll et al., 2015a,b), within the analysis of small-scale fisheries strategies, as this conceptual framework explains the causal relationship between new institutional arrangements of small-scale fishers, social capital, and the consequent positive impact on social-ecological resilience (figure 1). While these previous frameworks applied on the interplay between direct marketing arrangements and social capital (Stoll et al., 2015a), and on strategy diversification (Stoll et al., 2015b) with specific regards to the case of community-supported fisheries, our framework develop further, by enlarging the field of application within fisheries activities and involving diverse approaches to non-productivist practices and types of institutional arrangements that emerge from empirical findings.

Figure 1

This conceptual model builds on Stoll et al. (2015a) who conceptualised that the capacity to engage in new practices, such as non-productivist activities, can enable small-scale fishers build and nurture cooperation among fishers, including the ability to communicate with outsiders connected to the value chain, and in turn to gain access to or even create new markets, as well as tackle non-market issues that affect the social-ecological systems within which they are embedded. According to the framework developed by Stoll et al. (2015a) - fishers adopt non-productivist strategies to earn more money for their catch, as well as for related non-fishing activities, to compensate for the low ex-vessel prices received from fish traders. Furthermore, these strategies also include horizontal collective attempts for sustainable management of fish stocks or even vertical co-management of fisheries resources with different degree of success (Lleonart et al., 2014; Pipitone et al., 2014). In

building and carrying out such non-productivist arrangements, fishers must develop a set of rules to manage the practices and procedures of these businesses and, in the meantime increase their communication skills so that they can successfully interact with and retain their customers. Building on these assumptions, analysis in this paper, therefore, aims to depict how non-productivist arrangements can represent a type of institutional starter to build capacity among fishers and mobilise social capital in ways that contribute to the social-ecological resilience of the systems of which they are a part. In practice, this framework explains the reciprocal causal relationships between the adoption of fishers' market and production strategies - such as the improvement of product quality, the diversification of production patterns and market channels, the implementation of environmentally friendly fishing practices, the multifunctionality of the economic activities - and the existence and creation of interlinkages that shape the fishers' social capital. Building on previous literature and empirical observations, we argue that these causal relationships benefit the social-ecological resilience and the long-term sustainability of fisheries in terms of local marine habitat protection, market integration and stability for fishers, as well as social cohesion and economic viability of fisheries. Therefore, our framework explains how fishers adopt non-productivist strategies to earn more for their catch and for related non-fishing activities these practices make use of the existing social capital and also lead to the enhancement of social capital that goes beyond the relatively simple activity of collecting and supplying seafood. Combining principles from economics of multifunctionality (non-productivism) with tenets from the interactional school on social capital creation and resilience theory, fishers can be deemed as agents of change who engage in multifunctionality-oriented business arrangements and, therefore, mobilise social relations within and beyond the boundaries of their community and, in turn, trigger change towards social-ecological resilience. Following this format, we have analysed the empirical findings from our three case studies.

3. Methodology

In a first step, a desk-based analysis and context-specific literature review were conducted in relation to selected small-scale fisheries in the three EU case study regions (Cornwall, UK; Kavala, GR; Tuscany, IT) at NUTS level 2. A second phase involved designing and conducting qualitative semi-structured in-depth interviews with primary producers and stakeholders of the fisheries sector in the case study regions (Table 1). In addition, focus groups were carried out with fishers in the Cornwall and Kavala case studies.

Table 1

The three case studies include the Cornwall inshore fisheries sector in the UK, purse seiners and small trawlers operating specialised in small pelagic fish in the Kavala regional unit and its neighbouring ports, in Northern Greece, and small-scale fishery sector in Tuscany, Italy (figure 2). This paper applies a qualitative case study approach. In each case study region this included: i) a context-specific literature review in relation to fisheries; ii) a media analysis covering national, regional and specialised media from 2005 to 2016; iii) a desk-based analysis of market conditions and regulations; iv) face-to-face semi-structured interviews; v) focus groups and workshops involving primary producers and fisheries stakeholders (exclusively for Cornwall and Kavala). The choice of these three European fisheries' case studies (Cornwall, Kavala, and Tuscany) was guided by their inclusion in the H2020 project SUFISA "Sustainable Finance for Sustainable Agriculture and Fisheries", with the aim of identifying and correlating practices and policies in small-scale fisheries that can better support primary producers in a context of multi-dimensional policy requirements, market imperfections, and globalisation.

Figure 2

Cornwall is the county that forms the westernmost part of the south-west peninsula of England, bordered to the north and west by the Celtic Sea and to the south by the English Channel. Cornwall represents one of the key areas in the UK where inshore fishing remains a vital part of the rural community, both economically and culturally. Fishing activity in Cornwall is dispersed among more

than 50 ports, but in terms of fish landings and sales, Newlyn is the most important port in Cornwall. There are approximately 619 registered fishing vessels and nearly 900 active fishers. Almost 90 per cent of the vessels are under 10 m in length (Phillipson and Symes, 2015). In the Greek case study, the area covered comprises two fishing areas in the north of the Aegean Sea, namely, the Thermaikos Gulf, the Gulf of Chalkidiki, the Strymonikos Gulf, the Gulf of Kavala, as well as the coasts of Thassos and the Sea of Thraki. The fleet of Kavala consisted of 18 purse seiners in 2018, compared to 30 in the 1990s and more than 300 inshore fishing vessels, compared with 350 vessels in 2012 according to Anthopoulou (2012). These fishing areas provide more than half of the overall Greek production. In Italy, Tuscany is a region in west-central part of the peninsula, with a coastline on the Ligurian Sea (in the north) and on the Tyrrhenian Sea (in the south), and includes the Tuscan Archipelago. Although fishery is an active sector in the region – and coexists with a considerable marine aquaculture sector - Tuscany is still a net importer of fish and fish products. The most important port is Livorno and fishing activity is spread among 27 ports with 600 registered fishing vessels and 1053 active fishermen in 2015 (FAO). Small-scale fisheries comprise almost 75 per cent of the Tuscan fisheries (Prosperi et al., 2019).

The interview sampling was guided by the current issues facing inshore fisheries in Cornwall, purse seiners and small trawlers in Kavala, and small-scale fisheries in Tuscany, and related non-productivist activities. Within each case study a purposive sampling strategy was developed based on critical case sampling (Teddlie and Yu, 2007), focusing on specific critical cases that may not yield findings that are statistically generalisable, yet allow research to develop logical generalisations from the evidence produced. As such, the resultant findings need to be understood as illustrative rather than definitive (Patton, 2002). The final selection was guided by the need to find particular cases that can help decision-makers better understand fisheries-related non-productivist activities and to develop policy accordingly. Overall, in the three case studies, interviews, focus groups and workshop were carried out between February 2016 and May 2017. Experts across the fishing industry in

Cornwall (UK) were interviewed and, following examination of the resultant data, the researchers held a series of participatory focus groups involving inshore fishers at three locations in Cornwall, followed by a workshop composed of Cornwall fishery experts. Experts and stakeholders were interviewed in Kavala (Greece), both at the local and the national level, including experts and researchers, national and regional authorities, value chain members, environmental NGO and consultants, before conducting the focus groups and the workshop in order to better focus our research. Two focus groups have been conducted, one with 4 purse seine fishers and the second with 6 inshore fishers. A member of the research team participated as an observer in workshops of the "Kavala Small Pelagic fish management committee", with representatives from the Department of Fisheries of Kavala, the Banking Sector, an environmental NGO, the Hellenic Center for Marine Research, the Institute of Agricultural Economics and Sociology, and the Fish auction house. In Tuscany 10 people were interviewed: representatives of trawling fisheries, small-scale fishers (operating through "non-productivist" adaptation strategies), and stakeholders (including a representative of a national trade organisation of agriculture and fisheries "Coldiretti", two civil servants responsible for fisheries in the Tuscany Region, and a researcher in marine biology at the Interuniversity Center of Marine Biology and Applied Ecology of Livorno, Tuscany). The interviews, as well as focus groups, put the perspective of the fishers themselves at the centre of the research. They were designed to identify and explore the challenges that fishers encounter within their activities and the related diversification and non-productivist adaptation strategies they employ, in the face of uncertainty and limiting environmental and economic conditions. Interviews and focus group discussions for case studies in the project SUFISA were structured according to the common Conditions-Strategies-Performances (CSP) heuristic framework which allows the methodological reliability for a comparative analysis. In the CSP framework adopted, Conditions are "*the external (sector specific) and internal (farm specific) factors that a producer within a given commodity chain has to cope with*", Strategies are "*actions that allow producers to respond to and manage internal and external conditions*", and Performance is "*understood in terms of a general analysis of perceived*

likely outcomes of particular strategies" (Maye et al., 2018, p. 17; Grando et al., 2020). The main goal that lies underneath this analytical approach is to identify and disentangle how the conditions and strategies impact on the performance of fisheries and farms, including their longer-term sustainability and resilience. For instance, to inform policies to help farmers and fishers, strong attention was addressed to the need of new strategies in the face of new market regulatory dynamics and changes in policy interventions that expose primary producers to market instability and price volatility.

4. Findings and discussion from fisheries case studies in the UK, Greece and Italy

To more fully elucidate the relationship between non-productivist arrangements and related institutional emergence, with social capital creation and, in turn, with social-ecological resilience, this section is structured such that it follows the same logical format as the conceptual model. For each case study it will be described how the economic potential of different fishing-related non-productivist activities has incentivised participation and the link between the social capital and social-ecological resilience will be discussed. In table 2 we summarise the theory-driven interpretation of our empirical findings, as well as the causal interactions within the local fisheries analysed between non-productivist arrangements adopted, the different forms of social capital developed, and social-ecological resilience outcomes of fisheries in three different case study areas.

Table 2

4.1 The inshore fishing sector in Cornwall (UK)

The inshore fishing sector in Cornwall is characterised by strong individualism, a lack of trust and competition among fishers. Generation renewal is difficult as the sector is not attractive to new entrants. Inshore fishers traditionally sell most of their fish via the harbour markets, where they are price takers. In general, there is minimal cooperation within the local sector amongst fishers and,

where coordination does take place, it is likely to be within families. Similarly, in terms of vertical coordination, despite some evidence of fishers working with local processors, most of the inshore fishers in Cornwall sell their catch directly through the harbour markets.

"I'm not being funny, but a lot of the inshore fishermen are just lazy. They catch the fish, they throw it on the market, they don't get a good price, they moan. Well, do something about it. That's what we have done… Basically you aren't going to have it given to you on a plate; you've got to work for it. Most people can go and catch fish, but it's getting rid of it is the hard part. And the quality side of it… There's no point in catching the bloody stuff, if you're not going to look after it... If you don't look after it, nobody is going to pay for it" (Newlyn Focus group)

Within this framework, the Cornwall and Isles of Scilly Fisheries Local Action Group (FLAG) has been a critical actor in terms of supporting attempts to improve the quality of fish caught locally, as well as adding value to the fish caught, through valorising the "story" of the catches including highlighting sustainable fishing practices. The recent recognition of the quality and traditional origin of the Cornish fish, allied to better prices, has attracted more and more fishers to access Cornwall's local markets. In this respect, Cornwall is luckier than most in that there are a number of high-end restaurants and foodie hotspots, such as Padstow. Moreover, in some cases, in order to circumvent the middleman, they use social media to make direct contact with buyers, with some fishers now selling direct to buyers in London and strongly enhancing their market interactions. Selling to London (and indeed other large cities) has the potential to realise considerably greater prices for the fish sold, in that London-based restaurants and fishmongers have more buying power than their Cornish equivalents.

"We don't land anything at Newlyn... I come in with my fish in the morning, I speak to my customers [in or near London] *and they say I'll have that... and they get it in their shop 20 hours from when*

we've caught it. And the buyers can't compete with that... Whatever I catch is pictured on twitter, straight to my customers and they take everything we have...Like you said, you've got to be entrepreneur, you can't just catch fish, chuck it on the market. Those days are gone." (Newlyn Focus Group)

In this respect, the catch of inshore fishers was recognised as having the potential to be of the very highest quality available (in that it is usually landed on a daily basis), although this necessitates that the fishers involved look after their fish. The necessity to differentiate themselves in the market on the basis of quality have encouraged small-scale fishers to build and develop contacts along the value chain (such as with restaurateurs), thus increasing their social capital potential.

"The advent of smart phones is a massive opportunity… We've all got access to the internet and couriers and people based in London desperate for sustainable seafood… And yet it still comes down to the fact that it takes a lot of time to build up your own market and there are some fishermen that just want to fish. I think it is a good time to start looking again at cooperatives in Cornwall, but they haven't been very successful over the years... They depend on people, the right type of people working together" (Workshop Participant 1) *"It's also a lot of extra work … fishermen want to go fishing… They like the ability to bring their fish in, drop it off somewhere and the cheque comes through the post a few days later and they can get on with the business of fishing"* (Workshop Participant 2)

Developing such social capital through new and improved market interactions allows for catching less quantities of fish, whilst earning the same or a higher level of income, helps to ensure the resilience and long-term viability of the fishing activity for the small-scale fleet both in terms of habitat protection and economic performance. For example, developing sales to local restaurants and to London necessitates developing a good personal relationship with the head chef or dealer, to

the extent of calling them every day to tell them about the catch that is available. Promoting fresh catches to restaurateurs in cities, as well as intensifying (on-line) communication with them, allowed fishers to develop stable and quality sales to restaurants. There are also examples of cooperation amongst local fishers, whereby they pool their catches in order to ensure that they can supply these new outlets with a regular supply of fish, or fish products. In this case study we have observed that basically the quality and origin of catches from inshore fisheries have been promoted through local supportive and marketing actions. Concurrently, small-scale fishers have intensified their contacts with restaurants for direct sales through the use of mobile phones and social networks. The combination of these actions - mostly oriented to enhance the quality of catches and reduce fishing efforts - has led to the development of new non-productivist arrangements - and to bridging social capital between different actors of the value chain (e.g. fishers and restaurateurs) - likely to contribute to business sustainability and to the wider resilience of the marine system.

4.1.3. Purse seiners in Kavala (Greece)

The purse seiners and small trawlers sector in Kavala suffers from a difficult generational renewal due to a low attractiveness of the sector. The weak cooperation is further exacerbated by strong individualism, competition and a lack of trust among fishers. Furthermore, the state consistently disregards the fishers' federations and the confederation of coastal fisheries. Fishers in Kavala, complying to the existing regulatory framework, are obliged to deliver their catches to fish markets, where a daily auction takes place. Within this regulatory context, each fisher has an informal, typically oral, agreement with one of the 25 authorised dealers, who usually acts as an intermediary between the fisher and the buyer. Fishers, therefore, have very little or no control over the price of their catches: as such, fishers are price takers.

"*The cost of the empty box is 1€, with 8kg of fish within* [it costs] *2€ - 3€. Where to sell? You will not throw it away. For example, with 2000 boxes with fish, we loaded the trucks and when he was*

leaving he told me 3€ for each box and I had to pay for the truck, for the driver, for the ice" (Fisher, 1st focus group)

This compulsory market structure for purse seiners and small trawlers, and the unbalanced distribution of power within the value chain favouring intermediaries in detriment of fishers either purse seiners or inshore fishers, along with the traditional individualism of fishers and a lack of trust among them, result in an extremely low rate of fish products that are managed by cooperatives and collective fishing organisations. Fishers openly admit that they do not want other fishers to know where they fish, what they fish for, or what money they get for their fish. As such, there is a widespread impression that co-operation amongst fishers is very difficult.

"I have suggested - when EU programmes were available - to make a cooperative, to gather all the fish and to make our own producers fish market and sell the fish, to have one or two employees, to sell our fish and we will also advertise ourselves as coastal fishermen that fish is ours, local. But, 'hares cannot become a flock'" (Fisher, 2nd focus group)

The institutional landscape in the north of the Aegean becomes more complicated because of the system of restrictions applied, where purse seiners face spatial, temporal and dispose rules, e.g. monthly and seasonal restrictions. Concerning these restrictions, experts interviewed suggest that due to the fact that they are not based on scientific evidence but rather on a mere administrative rationale, the seasonal ban of catch while is appropriate for sardines, since it protects them during the reproduction period, does not apply to anchovies. Furthermore, purse seiners are not allowed to fish near the seashore and are obliged to land and sell their entire catch at a fish auction, while inshore fishers using different gear, are not facing the same limitations. On the other hand, international competitors can fish uninhibited to international waters. However, following discussions started in 2011, since 2015 the entire purse seiners' fleet of 18 boats in Kavala has been,

initially informally, engaged in a group. Fishers, together with different actors both inside (intermediaries) and outside the production system (experts, local authorities, NGO, retailers), attempt to design a collective management and monitoring system of the whole fishing effort. The final outcome of this effort was to conform with Marine Stewardship Council (MSC) eco-label and, thus, certify sardine and anchovy catches. This environmentally friendly collective initiative has been received favourably by consumers and adequately promoted, locally and at the national level, by a partner retailer. Thanks to this collective engagement, oriented towards natural resource protection, and the consequent creation of social capital because of a catalysed interaction between different actors (i.e. as mentioned above: experts, local authorities, NGO, retailers), local consumers have started to be aware of the activity of local fishers. Therefore, the retailer integrated the certification project in its corporate reputation strategy, through an extended nationwide campaign, creating vertical synergies. Thus, the resulting social capital has been mobilised by the group of fishers in order to promote their interests. For instance, in 2017 there was a price drop due to excessive supply, prompting the 18 purse seiners from Kavala to agree to a single landing per day and incorporate this practice in their fisheries co-management action plan with the consensus of other stakeholders participating, including intermediaries and the retailer. The hope was to keep prices more stable and at higher levels. Therefore, a bottom up cooperative initiative intended to reduce fishing effort – with the aim of improving the potential value added and the protection of marine resources - is now consensually suggested and adapted by regulatory authorities as a possible solution to the problems faced by producers within the whole food supply chain in Greece. As a positive result for the business of local fishers, in 2018, the amount of fish delivered to the auction was only 30 per cent of what it was two years before.

"*The one landing we did for a year period, worked well for the production, because we are interested in having fish tomorrow. Prices vary depending on the day and the demand. But mostly there are still fish; we do not catch them all.*" (Fisher, 1st focus group)

Furthermore, in addition to one landing per day, the purse seiner fishers of Kavala have also decided not to fish on Saturdays. This self-imposed practice seems to function well amongst the local fishers. This could be perceived as a successful strategy adaptation in the face of an external pressure. The need for the adoption of non-productivist arrangements, triggered by the MSC eco-labelling initiative, has led to the development of bonding (horizontally within fishers), bridging (vertically along the value chain), and linking (across institutions and authorities) social capital, and permitted the development of a concrete initiative that contributes to the economic sustainability of fishing, as well as to the resilience of the social-ecological marine system due to lower catches. In such a rather complicated fishery system, due to the unclear boundaries and the variability of restrictions, we have observed that the building of social capital through horizontal and vertical coordination resulted in the adoption of a strategy that has increased the resilience of the local system. At the same time, the success of the collective response to market pressures has led to further accumulation of various forms of social capital. By developing bonding social capital within fisheries, bridging social relationships between different actors of the value chain, and linking social capital between value chain actors and entities such as authorities and NGOs, has resulted in the establishment of a novel and quasi-formal institution, the "Kavala Small Pelagic fish management Committee". The Committee oriented towards enhancing the quality of catches and the sustainability of fishing, approved management guidelines and gained a nation-wide reputation. It has also set an example, and similar co-management efforts are taking place both for other fishing areas, sponsored by the partner retailer and for the establishment and participatory management of a marine protected area in the Cyclades (Aegean Sea), increasing further social recognition for local fishers considered as pioneers. Bonding social capital was therefore observed in the Greek local fisheries community, as a phenomenon within a localised homogenous group with common belonging and collective objectives (Grafton, 2005; Bakker et al., 2019), such as keeping prices high and stable while preserving marine resources. These common aims further strengthened the ties

between fishers, in a rather adverse institutional context, leading to enhanced trust and cooperation and facilitating positive outcomes (Granovetter, 1973), as well as increasing social cohesion and community identity (Bakker et al., 2019). Such strong cohesion between fishers in Kavala, allowed further articulation of social capital connections in the local fisheries, not only by means of bridging social capital but also in terms of linking social capital. These kinds of new connections for fishers with different actors, inside and outside the production system, such as experts, local, regional and national authorities and an NGO, but also with consumers, were built to manage and monitor the whole fishing effort besides the fishers themselves. Such linking social capital's interactions are characterised by connections tightened between actors across scales of governance, in different positions of power and decision-making, and are acknowledged to support a shared management of fisheries between fishers and regulators (Brooks, 2010; Grafton, 2005), as well as creating opportunities for communities to access and manage resources (Magis, 2010; Bakker et al., 2019).

4.1.3. Small-scale fisheries in Tuscany (Italy)

Small-scale fisheries in Tuscany are characterised by high geographical fragmentation; as such, individual fishers tend to be isolated and not powerful in the marketplace. It is also recognised that there is intense competition within small-scale fisheries, as well as between small-scale fishers and trawlers. Local restaurants and wholesalers have the potential to be an important market channel for small-scale fisheries, but low sale prices and transaction costs for payment can discourage fishers from selling. There are also concerns that there are insufficient people coming into fishing, with a lack of human resources being trained or willing to become fishers. Moreover, the economic crisis since 2008 has impacted the local fisheries sector in terms of price levels, demand, and volatility. Such a critical situation for small-scale fisheries has induced many fishers to seek out new markets and products, differentiation strategies, as well as the engagement in quality-oriented and non-fishing activities. This has led to a number of adaptation and transformation strategies. For example: diversification activities, short supply chains and direct sales, investing in technological innovation

and increasing international sales, selecting more valuable catches, and developing more recreational activities such as pescatourism. Some fishers have developed artisanal activities such as transformation and processing in order to create added value from their catches. Small-scale fishers have also attempted to create new market channels such as sales to solidarity purchasing groups, or directly to consumers through a consortium. Thus, short food supply chains have been developed, including additional processing at a local level in order to create added value. Also, a growing interest in pescatourism is seen as providing the opportunity to open up new pathways, diversification and multi-functionality (Prosperi et al., 2019, 2020).

"Once we joined the solidarity purchasing groups, we could also join the short chain: we could then avoid dealing with wholesalers. Now the fish is loaded into the van and taken directly from the fisher to the consumer. The consumer can save money, and for us it is an advantage not to deal anymore with wholesalers, so we can earn something more." (Anonymous fisher 1, 2016)

These activities – namely sales through community supported short food supply chains, fish processing, and pescatourism – have allowed fishers to integrate and diversify their income as well as to provide an opportunity for new employment, releasing the pressure on fish stocks. From interviews with fishers engaged in pescatourism, it emerged that this activity can represent an important strategy of diversification for them. More specifically to our purpose, it emerged that these non-productivist activities have allowed fishers to integrate into new networks of actors and, thus, to develop many new contacts and further develop social capital (including bridging capital). For instance, with regards to a fishing cooperative in Marina di Carrara (Tuscany) that has shifted from business-as-usual fishing (i.e. fishing by trawling and selling at the harbour) to quality-oriented fishing and processing catches for sales to solidarity purchasing groups, it was observed that the use of organic ingredients in food processing had led to the participation of the cooperative in organic

fairs and, thus, created the opportunity to establish new business arrangements with new actors, allowing for integrating market channels within the "organic network":

"… all the ingredients I use for processing fish are 100 per cent organic. So I have started to go to organic fairs in the region to find the ingredients for my processing activity, and there I could meet many producers and actors of the organic network and this allowed me to create many business contacts and find new clients." (Anonymous fisher 2, 2016)

Another example is represented by the activity of pescatourism, which enables the creation of connections between actors and customers due to the convivial nature of the activity. In particular, it was observed that pescatourism could be a promotional factor for selling to solidarity purchasing groups. In fact, pescatourism customers who were initially only tourists during the summer, have then become fish buyers (as consumers) during the winter and vice versa, thanks to the connections that fishers have established with their customers.

"*I was involved in a solidarity purchasing group in the North of Italy, in Milan, thanks to my activity of pescatourism. In fact, the tourists who used to come in my place during the summer and participate in the pescatourism tours on the boat, then started to ask to buy the fish I catch during the winter, for having it supplied in their place.*" (Anonymous fisher 3, 2016)

"*We informally promote our activity of pescatourism to the members of the solidarity purchasing groups to which we sell our fish during the winter. So it happens more and more often that, during the summer, the clients come to see us here; they enjoy the sea, we bring them on the boat with us to fish, and then they come here at the fishmonger to eat at lunch or for dinner.*" (Anonymous fisher 2, 2016).

Often these links between pescatourism fishers and their customers is strengthened through solidarity purchasing groups that – for their collective and supportive nature - represent a key factor in creating bridging social capital and opportunities for new arrangements thanks to improved market exchanges and social interaction. Furthermore, the additional activity of processing fish and selling it directly to consumers, allows the fishers to embed and capture more of the value added. Concomitantly, these quality and environment-oriented goals of production imply a decrease in catches as well as respect for the seasonality of the species, contributing to the protection of the marine resources, and therefore to ecological aspects of resilience. Therefore, such enriching social/business interactions provide the opportunity to build new arrangements characterised by efforts on quality, environment protection, and multifunctionality, contributing to both the economic long-term sustainability of fishing and the resilience of social-ecological systems. In such a small-scale fisheries' context, the adoption of diversification strategies (e.g. direct sales through short supply chains, food processing and pescatourism) have led to building non-productivist arrangements and to enlarging and connecting the social capital of fishers with food processors and the organic network, through new relationships and business activities. In turn, the joint effect of these new institutional arrangements is likely to impact positively the resilience of the marine resource and the long-term viability of the fishing business, through the lower pressure exerted on fish stocks and to the increased creation of value added. Innovation in practices (seafood processing and pescatourism) has led fishers to connect respectively with the organic food network and with new "winter customers", opening new and large opportunities for marketing their products and further developing innovation in food processing.

5. Conclusions and perspectives

This paper represents an additional contribution of empirical observation and analysis to the emerging literature that locates small-scale fisheries in the context of a transformation required for sustainability and resilience in Europe (e.g. Lloret et al., 2018; Jentolf, 2019; Penca et al., 2021). Empirical evidence analysed in the three case studies on fisheries in UK, Greece and Italy, suggests that the mutual interaction between non-productivist arrangements and social capital creation brings to positive outcomes in terms of social-ecological resilience mainly by reducing fishing efforts and increasing diversity of catches (environmental protection), improving price profitability, equitable management and value added creation (economic viability), and strengthening the focus and the social role of fisheries communities on sustainability. More in detail, in this paper we have observed that in building non-productivist arrangements, fishers develop rules to manage the practices of new business models and increase their communication capacity to better interact with customers as well as to expand and consolidate their customer base. These practices can lead to the development of further bonding and bridging social capital or, in some cases, build on existing social capital. Therefore, we argue that this coexistence of social capital is directly relevant to increasing social-ecological resilience and to improving the economic viability of fishing businesses, also by overcoming a lack of cooperation and scarcity of financial resources. Furthermore, collective arrangements have been stated among the design principles for the sustainable governance of social-ecological systems (Anderies et al, 2004). Collective action can be promoted through practices aimed at bonding social capital, while connection with new ideas, information and external resources, can be enhanced through processes oriented towards bridging social capital. This coexistence of different types of social capital is considered directly relevant to increasing social-ecological resilience, since working cooperatively and gaining access to new resources and new ideas, has demonstrated to help fishers to overcome the two main constraints of the small-scale sector: lack of cooperation and financial resources (Stoll et al. 2015a).

The conceptual framework proposed in this paper builds on previous frameworks (Stoll et al., 2015a,b) and develop further, by broadening the field of application within fisheries activities, thus mobilising diverse approaches to non-productivist practices and types of institutional arrangements that emerge from empirical findings. Thus, we argue that non-productivist arrangements - implemented to respond to restrictive policy and market conditions – help build new forms of social capital through the ability to communicate with actors or outsiders connected in the value chain and the establishment of internal bonds. When successful, these new institutional arrangements enable - in a co-evolutionary process – the development of new practices and opportunities such as creating markets and broadening customer targets, as well as tackling nonmarket issues that affect the social-ecological systems within which they are embedded. For the nature of the production activities underneath these institutional arrangements, such adaptive agency and ability represent the key pillars of general resilience and of long-term sustainability for the social and ecological components of dynamic systems associated with marine resources. Therefore, by adopting and establishing non-productivist arrangements, fishers are likely not only to earn more money from their catch, as well as for related non-fishing activities, but they have also the opportunity to develop a set of rules (e.g. procedures, social practices, and protocols) to manage these new businesses and, in the meantime, to increase their communication skills so that they can successfully interact with and keep their customers and thus increase their competitiveness. These findings confirm previous empirical and theoretical assumptions that proactive social networks, which actively create strong social capital, can ease the creation of institutional arrangements with the goal of preserving the natural environment while at the same time improving business outcomes (Granovetter, 2005; Lamprinopoulou et al., 2006). As from previous studies on fisheries, bridging social capital is composed of links between different groups across a supply chain through which it is possible to share, spread, and broaden knowledge, innovation in practices, and common goals (Grafton et al., 2004; Magis, 2010). Such connections are acknowledged in the literature as facilitating local and regional cooperation between different communities (Granovetter, 1973; Grafton, 2005). Further

research in this field should address what is the perception and role of social capital creation for fishers and local fisheries community, since this study is not tackling this issue because of its nature which is mainly oriented towards the understanding of the relationship between social capital and fisheries strategies. In fact, social capital – including social cohesion, mechanisms of reciprocity, 'positive' social norms, strong social fabric, local 'good' governance, or capacity for collective actions – has been already considered as a critical element of resilience (Adger, 2003; éné et al. 2016). Furthermore, robust social capital, founded on norms, trust, communication, and connectedness between people within differing networks and groups, is considered an important attribute in sustaining fisheries and in achieving sustainable fisheries management, since it can support fishery stakeholders during times of challenge and change, such as for emerging institutional arrangements and economic and resource fluctuations (Schaffer, 2016). However, conflicts of views can emerge as, from some initial observations of Putnam (1993) on social capital and in small-scale fisheries cases, it was observed that social capital can lead to exclusion and can reduce a household or community's ability to adjust, adapt, or transform (Putzel, 1997; Cleaver, 2005; Coulthard, 2011; én et al. 2016), while more recent Bourdieusian views acknowledge the role of social capital in building the image of the "good fisher" in specific habitus and fisheries communities, as well as the capacity of social capital in progressively embedding new practices that, in turn, become traditional in their cultural capital (Bourdieu, 1990; Gustavsson et al., 2017).

Additional research should also address the interactional dynamics that has been studied in this paper within the context of conflicts that concern - or might concern in particular local contexts - small-scale fisheries, such as resource competition with other types of fisheries (e.g. trawlers), tourism activities, recreational fisheries, and fisheries that are active in nearby international borders. In conclusion, initiatives aimed at encouraging non-productivist activities within collective schemes and enhanced interactions between small-scale fishers, and along the value chain, have been shown to be positive prerequisites for establishing social capital and achieving social-ecological resilience in

marine systems in terms of environmental protection (reduced fishing efforts), economic viability (price profitability), and related fishery community wellbeing. The independent use of communication technology and social media has also proved to be key for some fishers, in both keeping and building relationships and enhancing social capital within the value chain. Furthermore, in the three case studies it was interesting to observe that situations of crisis – such as the economic crisis in Italy and Greece, and Brexit in UK – might be considered as factors triggering communication and collaborative initiatives, both between fishers and with external actors along the value chain. Similar trends are observed as Covid-19 impacts on fishers' strategies and involve the innovative adoption of direct online selling to consumers (Penca et al., 2021). With the aim of informing fisheries policy and decision-making, through this analysis, we empirically depicted how non-productivist arrangements can represent a type of institutional starter to build capacity among fishers and to create social capital in ways that contribute both to the long-term viability of small-scale fisheries businesses as well as to the social-ecological resilience of the systems of which they are a part.

Credit authorship contribution statement

Paolo Prosperi: Writing - original draft, Investigation, Conceptualization. **James Kirwan:** Writing - review & editing, Investigation, Conceptualization. **Damian Maye:** Writing - review & editing, Investigation, Conceptualization. **Emi Tsakalou:** Writing - review & editing, Investigation, Conceptualization. **George Vlahos:** Writing - review & editing, Investigation, Conceptualization. **Fabio Bartolini:** Investigation, Conceptualization. **Daniele Vergamini:** Investigation, Conceptualization. **Gianluca Brunori:** Investigation, Conceptualization.

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	Interviews	Focus Groups & Workshops	Stakeholders involved	Themes explored
Cornwall	17	3 Focus Groups 1 Workshop	6 Supply chain / harbour masters 4 Regulations and marine policy actors 2 Producer organisations 2 Local economic development actors 2 Researchers 1 Bank manager	Regulatory and market conditions; Marine regulations for inshore fisheries; Brexit impacts on fisheries; Succession; Access to finance; Supply chain arrangements and business strategies
Kavala	16	2 Focus Groups 1 Workshop	6 Coastal fishers 4 Purse seine fishers 2 Researchers 1 Regional administration representative 1 Banking sector actor 1 Environmental NGO 1 Fish auction actor 1 Fisher	EU Fisheries policy, National Fisheries policy, Supply chain organisation and market opportunities, Sale prices, Marine environmental issues (stock depletion)
Tuscany	10	--	5 Fishing cooperatives 2 Experts 1 Fisher (self-employed) 1 Producer organisation 1 Researcher	EU Fisheries policy schemes and regulations, Market dynamics and opportunities, Sale price level, Succession and Recruitment, Marine environment issues,

				Supply chain organisation, Stock depletion

Table 2. Stakeholders involved in research activities targeting fisheries in Cornwall, Kavala, and Tuscany.

	Cornwall *(UK)*	**Kavala** *(GR)*	**Tuscany** *(IT)*
Non-productivist arrangements	- Collective initiatives for the improvement of the quality of local catches - Valorisation of the "story" of catches, promoting traceability and sustainable fishing practices across the value chain - Coordination between fishers and local/London restaurants - Innovation in local processing and throughout the value chain, to increase value added to seafood	- Collective and consensual setting of rules through a stakeholder committee at the regional level - Valorisation of catches, by improving traceability and sustainable fishing practices - Building a regional informal group of all purse seiners and trawlers in the area to coordinate efforts	- Development of community supported short food supply chains - Improved seafood processing at a local level in coordination schemes between actors - Development of coordinated recreational activities such as pescatourism
Actors involved in creation of social capital	-Cornwall Fisheries -Local Action Group -Cornwall Wildlife Trust -Restaurateurs in London	-Experts -Local authorities -NGO -Retailer	- Solidarity Purchasing Groups - Organic producers and stakeholders - Tourists
Outcomes in terms of social-ecological resilience	- Reducing fishing efforts and protecting fish stocks - Increasing price profitability for fishers - Creating and sharing awareness on sustainability issues for fisheries	- Restricting and reducing fishing to keep profitable prices and protecting stocks. - Co-management and cooperative (horizontal) arrangements allowing fishers to have more viable business	- Reducing fishing efforts and protecting fish stocks - Increasing price profitability - Creating and sharing awareness on sustainability issues for fisheries

Table 3. Non-productivist arrangements, actors creating social capital, and social-ecological resilience of small-scale fisheries in three different case study areas.

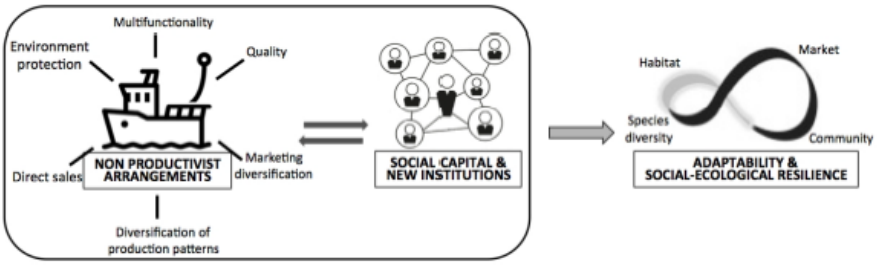

Figure 1. Conceptual model describing the interplay between non-productivist arrangements and social capital construction towards resilience increase in small-scale fisheries activity (modified from Stoll et al., 2015a,b).

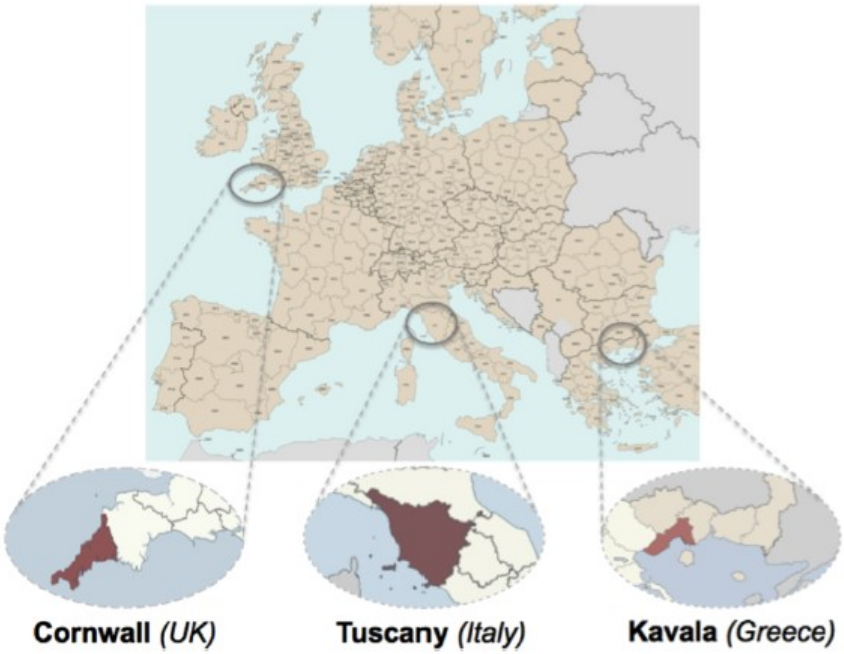

Figure 2. The geographical areas of the three small-scale fisheries studied, i.e. Cornwall (UK), Tuscany (ITA) and Kavala (GR).