Diversification of fisheries activities and construction of sustainability

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ABSTRACT

While French marine fisheries must cope with increasing difficulties, the concept of multifunctionality of fisheries (as previously observed in agriculture) is emerging through a diversification of activities. Indeed, fishers resort to alternatives in order to sustain their activity by calling on new ways to interact with environment, institutional players, scientists, local stakeholders and customers in addition to their usual production activity. They develop alternatives based on the unit of production (vessels and products), by altering relations among fishers and the wider context in which they are embedded – the coastal zone. When considered alone, each new activity looks like an individual solution of resistance to a jeopardizing situation. When considered at a whole fishery sector, this strategy may contribute to achieve sustainability.

In this paper, we question how "multifunctionality in agriculture may be applied to fisheries by focusing on diversification activities". The analysis comes from results from a project conducted in 2008 in Brittany (France) about fishers and their diversification activities. The application of the "agricultural diversification approach" on fisheries raises many questions on acceptability by fishers, new constraints and opportunities. These questions are partially addressed in this paper by looking at a specific French case study. By screening the on-going diversification activities, we develop an *ad-hoc* classification. Then, we identify opportunities of diversification depending on fishers' acceptability. Finally, we analyse how different diversification strategies can enhance resilience of small-scale fisheries and make them more sustainable and permanent on the coastal zone.

INTRODUCTION

As in many fisheries, the French context of fisheries is characterized by a decrease in natural resources they depend on, an economic environment in crisis, changes of marine biodiversity probably linked to climate change, fluctuating consumer demands, and unexpected evolution of regulatory systems, among others. Then, fisheries activities must face new strong constraints. Turnovers are falling or maintained in difficult conditions that threaten many businesses. An increase in fishing effort is no longer an effective response to these constraints. In the future, European and national maritime public policies should focus on minimizing pressures on marine ecosystems and managing conflicting uses (fisheries activities, aquaculture, tourism, leisure, raw material extraction, etc.). The wide range of current and potential uses should make the management of living marine resources more complex. Hence, fisheries businesses have

to be reactive by adapting alternatives and innovative strategies to cope with these new challenges.

The concept of multifunctionality

Without arguing on all available details and discussions dealing with the concept of multifunctionality [12], we can highlight two approaches in agriculture. Firstly, in the so-called positive approach, the multifunctionality is defined by characteristics of the production process:

- existence of multiple, basic and different products that are jointly produced ;
- other different products induce externalities or goods of public interest, which lead to markets for these goods that do not exist or badly work [15].

Secondly, in the normative approach, we look at agriculture by considering all roles, multiple functions and objectives any company wants to assign [8]. Those functions are economic (foodstuffs quality, direct selling, etc.), social (contribution to rural viability, employment, etc.), environmental (landscape conservation, water management, etc.) and cultural (traditional patrimony).

The multifunctionality of agriculture and the role of the farmers are recognized within the Agriculture Policy at national and European levels. The French policy also fosters farmers to diversify their activities. These multifunctional activities are developed under the normative approach to contribute to the general society welfare. Then, as for what is known in agriculture; we assume that the multifunctionality could fit to the fisheries sector.

Application of the concept of multifunctionality to the fishing sector

Like in agriculture, the multifunctionality issue can be applied to many sectors. Indeed, fishing activities also include social, economic and environmental components. The FAO Code of Conduct for Responsible Fisheries (FAO, 1995) argues that "*fisheries, including aquaculture, provide a vital source of food, employment, recreation, trade and economic well being for people throughout the world, both for present and future generations and should therefore be conducted in a responsible manner"* [6]. By considering the crisis that affects all fishing activities, it turns out that the future of this sector has to be anchored in a sustainable logic and a multifunctionality perspective. Progressive transitions and changes in practices are known to take place in small-scale fisheries as a response to cope with new constraints and higher uncertainties.

In this paper, we question how the "multifunctionality approach could be applied to fisheries by diversifying activities". Our analysis is based on results from a project conducted in 2008 in Brittany (France) on fishers and diversification activities [10].

CONTEXT IN CRISIS: ALTERNATIVE DEVELOPED

Small-scale fisheries in Brittany (France)

By looking at the economic indicators of fisheries businesses in Brittany during the last decade (this region represents 40% to 50% of total French fisheries), we can observe that all of them collapsed. As an example, the *gross operating profit* is decreasing for the entire fleet (Fig. 1). While a general decrease is observed, the beginning of the decline can vary, depending on the adaptability of the studied fleet or "métier" to new

conditions. For the less adaptive fishing vessels (trawlers > 20 m.), the decrease started 10 years ago; for the more flexible, it appeared only 2 or 3 years ago.

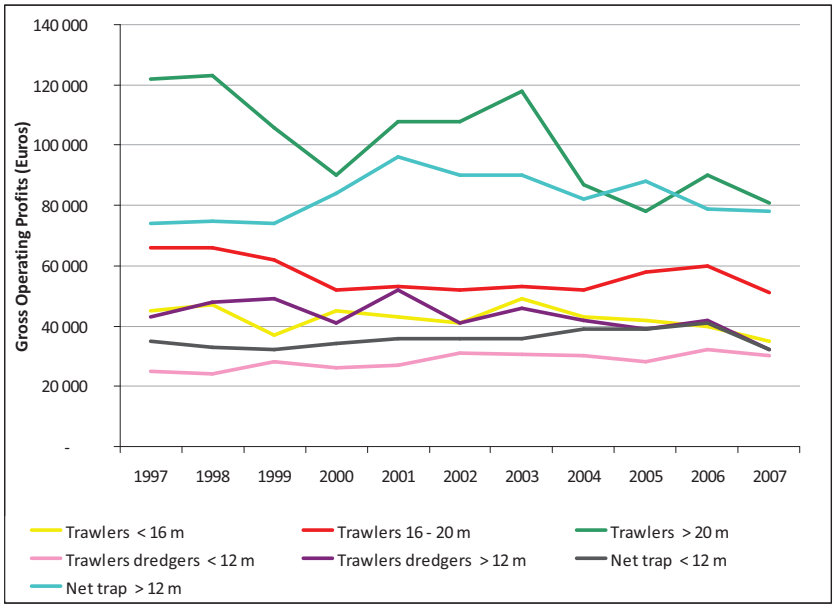

Figure 1. Evolution of the gross operating profit: average for different categories of fishing vessels in Brittany (in constant euro 2007)- *Source: Observatoires des pêches de Bretagne*

The example of the trawler fleet (> 20m) allows to identify the nature of the problem. The *gross operating profit* is decreasing although the turnover is maintained or increased. This is the same for the entire fleet. As it is almost impossible to significantly reduce the costs, one solution for fishing businesses is to increase their turnover by diversifying activities (new market policies or activities linked with fishing activities, etc). The current economic context calls for new sources of revenues. In fact, they follow the same path as in agriculture by implementing diversification.

Some alternatives developed in agriculture for building a better sustainability

Agricultural diversification can be defined as the search for new products, or the increase in value of a product already in place [11]. In other words, within this process, we can include complementary agricultural activities (value-adding activities, food processing, provision of services, non-farming activities such as restaurants and stores) [9]. The diversification approach expresses a producer's strategy of establishing, under a unique status of farmer, his agricultural activities together with other activities that are in continuation with his primary productive function and based on his farm.

By broading the range of their activities, farmers earn complementary incomes that can maintain or create employment in the rural area. The addition of these micro-impacts plays a role in the sustainable development of rural areas [9]. Impacts of diversification are various and can match with expected contributions of multifunctionality:

- for the durability of farm businesses by creating additional value, employment and complementary incomes;
- for the image of agriculture by breaking remoteness, sharing practices and farmers' jobs, and promotion of agricultural products;

- on rural development by maintaining a rural dynamic, developing new networks within rural areas and nearby cities, improving livelihood, promotion and conservation of local patrimony;
- developing new alternatives to farm expansion and maintaining small-scale farms on rural areas.

Different forms of diversification can be identified: services to the environment, development of tourism services, new market strategies (promotion of quality, direct selling, alternative food systems, etc.).

Application of multifunctionality to fisheries: diversification of fisheries activities

Diversification appears in the development of fisheries activities such as "blue-tourism", "ecological-activities", new techniques of marketing, etc. As for agriculture, diversification of fisheries activities can be defined as complementary activities to production, but linked with the product, the job or the business that fishers practice to get an additional income but also to promote their products, job or port (for less than 50% of the total turn over) [10]. Therefore diversification constitutes a new strategy for the fisher to practice fishing activities (capture or extraction) simultaneously with other activities in continuation with the production activity, or based on the fishing business.

Some fishers have already found individual or collective solutions by developing diversification initiatives. Some of them practice direct selling to consumers on the port or in markets. Others increase their earnings by creating collective brands and promoting their products; others collect waste in the sea or participate in scientific programs. However, these diversification activities may largely depend on local opportunities, traditional practices, constraints in place. However, directly applying agricultural diversification on fisheries may raise other issues on the acceptability of diversification activities by fishers. We can also ask questions about the feasibility, constraints or opportunities to develop such activities.

AN ILLUSTRATIVE FRENCH CASE STUDY

Previous works [9] has shown how the concept of multifunctionality can be applied to the fisheries sector. The objective of the case study conducted in Brittany was to analyse existing practices of diversification and their potential of development by analysing fishers' acceptability of this approach.

Methodology and objectives

The core of the research method was based on questionnaires for small-scale fishers. We consider small-scale fisheries as inshore-fishing usually carried out by fishing vessels of less than 16 meters (fishing trip of few days). This survey aimed at collecting information about the activities already in place (difficulties met, constraints, analyse of experiences) and gathering fishers' perceptions about development of such activities.

A preliminary analysis through the available bibliography and a review of existing diversification activities (mostly based on interviews) led us to classify diversification activities to make the survey easier. This classification does not distinguish lucrative activities from non-lucrative activities (Table 1).

Table I. Classification of diversification activities

Tourism and maritime culture activities	**Sea environment activities**
Tourists chartering, ship visit	Waste collection at sea
Tasting, catering	Watch over sea environment activities
Accommodation	Experts boarding
Education	**Services supply**
Participation to maritime fair or festival	Ship rental
Sea products promotion activities	
Joining labels or collectives brands	
Direct selling to consumers (harbour, local open markets)	
Processing and packaging	
Co-product selling	

The questionnaires were designed from the inventory undertaken in the previous phase. Two questionnaires were designed in order to record all the information on the conditions of setting up diversification activities and acceptability of fishers:

- direct interviews with fishers who have already developed diversification activities → ***analysis of the experience in place***
- closed questionnaires for fishers who did not start diversification activities → ***analysis of the opportunities of development and fishers' acceptability***

Finally, 10 interviews and 40 questionnaires were filled with fishers in two pilot sites in Brittany (Saint-Brieuc and Pays de Cornouaille) (Fig. 2). The low number of filled questionnaires does not allow any significant statistical trends to be generalised at the entire country.

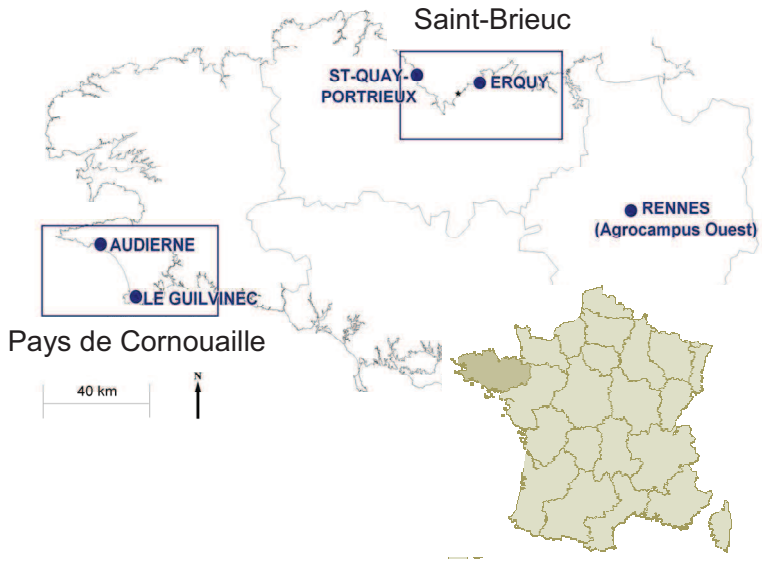

Figure 2. Location of the two pilot sites

Fishers' level of involvement in diversification activities: a first acceptability evaluation

This survey (Fig. 3) highlights a hierarchy of acceptable diversified activities that depend on the level of constraints and the opportunities for their development. The importance of each sector describes the relative importance of each synthesis indicator: the "executed rate" (number of fishers who practise this activity), the "potentiality rate" (number of fishers who plan to develop this activity and who are interested in this activity), the "rejection rate" (number of fishers who judge the activity as uninteresting or unworkable).

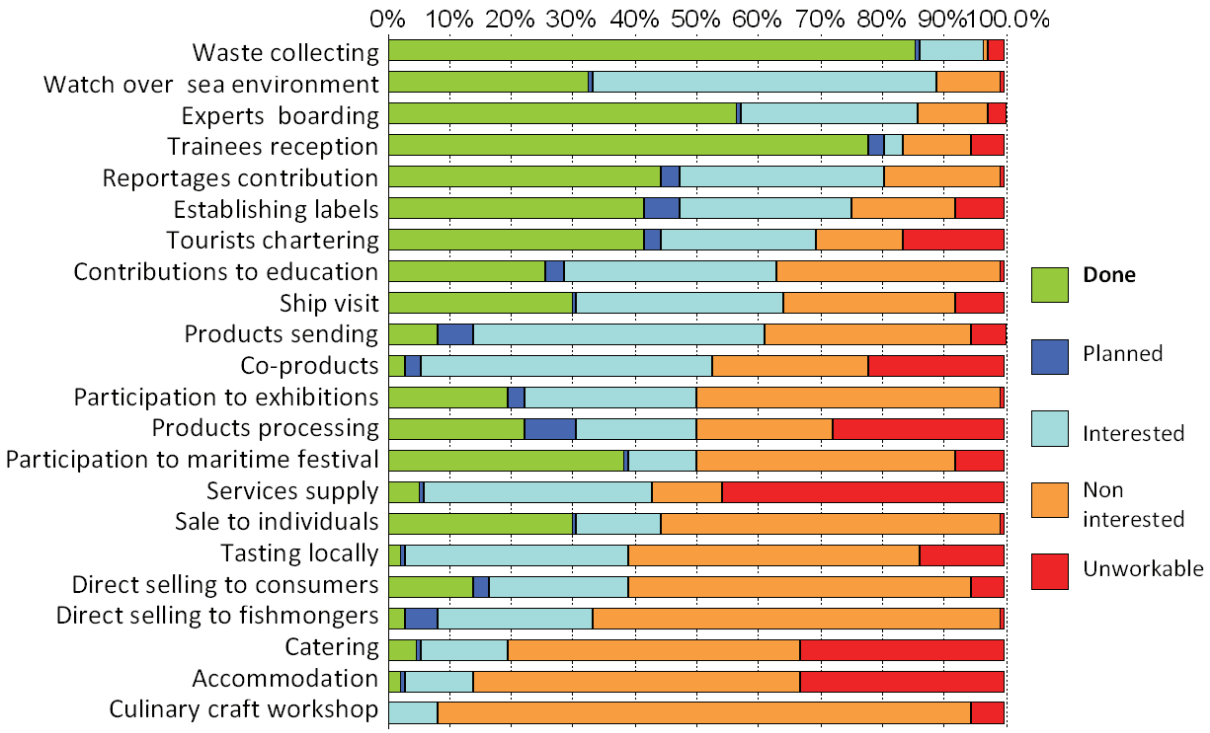

Figure 3. Hierarchy of fishers' acceptability from the achieved rate for each diversification activity [10]

Fishers declare to mainly carry out waste collecting activities at sea and expert and trainees boarding. They are also interested in ecological activities development and promotion of sea products initiatives (label and in few cases, direct selling).

Concerning the tourism sector, tourists chartering and ship visits look predominant. Other activities that need new equipments on land and the presence of one person on land are less represented. However, the acceptability rate for this tourist oriented activity highly depends on where interviewees are living. Fishers living in Cornouaille are more ready develop this type of activity because of a greater tourist population. This observation confirms that local opportunities influence the potential for diversification.

Concerning the promotion of sea products, the number of fishers who practise or are interested in related diversification is important. For many of them (61%) direct

expedition of products to consumers could be involved. Differences are observed according to the type of fleet: for example, high-sea fisheries representatives would be more interested in promoting co-products. Direct selling again depends on the local context and opportunities as they are linked to location traditions and consumer demand.

Removing waste and collection at sea as well as ecological activities is more widely performed. 90% of interviewees are also interested in monitoring activities in favour of the marine environment. Ship rental does not represent any options for 58% of interviewed fishers. But, this may be explained by the absence of demand from outside industries in the studied area.

Constraints and obstacles for implementing diversification

Our survey also allows to identify two types of constraints as expressed by fishers themselves:

- internal constraints: related to business operations, lack of time, brakes in link with individual behaviour (individualism of fishers), etc.
- external constraints: laws and regulations, administrative constraints, local context, lack of information, etc.

The emergence of diversification seems limited because there is not a defined status for such activities, which increases constraints imposed by new regulation on safety on board and health restrictions, as well as difficulties for fishers to cope with non-stop change in rules. Lack of time is also frequently mentioned: indeed, fishing activities (working at sea) is often decoupled of diversification activities that are mainly based on land.

Logics of diversification

In front of the wide range of proposed activities, fishing businesses and constraints, various strategies for diversification can be expressed. Most of dynamics are the result of innovative initiatives that emerge from collective actions. Although diversity of fishers' perceptions and motivations make the analysis complex, some general trends can be observed to allow to clarify some strategies for possible diversification. Four main strategies are identified depending on four criteria: (1) individual or (2) collective actions, then (3) innovative dynamic *versus* (4) an opportunistic approach. One given diversification activity can correspond to several categories depending on the context: tourists chartering can be directly offered by the fisher himself (dynamic individual strategy), or organized by a "tourist business" that contact fishers punctually (opportunistic collective strategy). These different logics of diversification do not entail the same social or economic impacts. Dynamic strategies need a constructive development phase including a long-term objective. Conversely, opportunistic strategies respond to punctual occasions for improving the business. So far, our survey shows that most of the interviewed fishers demonstrate an individual dynamic strategy.

Individualism is strongly expressed in the fisheries sector and does not often facilitate collective action. Many reasons are deeply rooted in how fisheries work. Fishing activities, centred on a common pool resource, lead to strong competitions among fishers, which is not so reflected on land. Moreover, temporalities are different from one

business to another one. Fishers do not share the same work schedule, day-off, etc. This lack of common rhythm also explains the lack of cooperation within the fisheries sector. The emergence of diversification dynamics should be based on fishers' active participation to create collective action. However, by maintaining an individualist approach to their job, fishers are isolated from territorial logics.

Moreover, economic reasons explain why fishers develop diversification activities (52.8% of the interviewees). For 27.8% of them, the objective is to maintain their business and for 8.3%, this is just a way to cope with changes. Only a small part (8.3%) of fishers perceives diversification as an opportunity to preserve the environment. These perceptions depend on the activity in place. For example, tourist chartering is put in place to display and share fishers' occupations, practises and as a way to improve their image. Moreover, fishers who participate in non-lucrative activities look for other objectives; for example, by participating to maritime culture festivals, fishers do not improve their revenues but contribute to maintain their own community together with a sense of tradition and history. The wide range of diversification logics, opportunities and constraints illustrates the high number of fisheries situations and the context in which they evolve. Therefore, we cannot define diversification as a model of development but instead as a strategy of development.

DISCUSSION

Defining the diversification of fisheries activities is still confusing and depends on the context in which they are embedded including motivations and logics. Some activities can constitute the support of operating businesses (direct selling, promotion of sea products, etc.), while others are more anecdotal and correspond to new socio-cultural dynamics from other professional people who are not users but coastal zone stakeholders. Diversification can be a solution for fishers to cope with new constraints by introducing innovations. Diversification is not a solution in itself but represents a way to resist in front of a real or perceived degrading economic and environmental context.

Our study shows that fishers are interested in diversification activities. They also express needs on technical and regulations aspects. The following discussion will focus on the contribution of diversification of small-scale fisheries to put their resilience in practice. Resilience can be considered here as a key component of the fisheries system we analyzed. Indeed, as defined first by Holling [7] then discussed by many others authors [1, 6, 16], the capacity of small scale fisheries to adapt to reorganize themselves when facing constraints can prove their resilience and adaptability. By such widening their activities, small-scale fisheries can react more rapidly to rapid changes and adapt their practices towards sustainability.

To what extent does the diversification of fisheries activities contribute to maintain fisheries activities?

Diversification means for fishers to develop new sources of revenues. Then, new activities contribute to create other additional values and employments (sellers, guides, etc.). Moreover, when based on land, these new activities make fishers more visible in their local community. They endorse new roles as stakeholders who contribute to the promotion of the coastal zone. Diversification is a way to anchor fisheries within local

communities and therefore in coastal management. In this sense, diversification activities cannot be applied generally; they depend on places, products, and traditional contexts. We may suggest this approach as a "niche" solution towards a common objective of fisheries integration in the coastal zones.

To what extent does the diversification of fisheries activities improve the image of fishers?

By sharing their activity with other actors on the coastal zone, fishers also contribute to improve their image and promote sea products. Participation in maritime festivals, tourists chartering and direct selling make them visible on the coast and allows them to interact with other individuals (tourists, local population, etc.); usually, they live most of their life off the coastline, at sea.

To what extent does the diversification of fisheries activities contribute to maintaining coastal dynamics?

Our case study analysis shows that fishers usually display individualistic attitudes. They rarely behave as players in collective power, which may lead to low social sustainability and a fragile society. However, we have seen that collective approaches are more efficient in developing diversification activities. The social capital as defined by Putnam [13] (collective community action) brings us back to the importance of collective action. To preserve small-scale activities, fishers are fighting to first preserve their own business as an individual and, later, their community as a whole. Meanwhile, they use social capital to satisfy social needs. Interrelations are created to settle diversification activities and to ensure their efficiency. By participating in maritime festivals, for example, they mobilize their social capital: they collectively promote their community and local patrimony by creating new dynamics.

To what extent does the diversification of fisheries activities represent an alternative to industrial expansion of fisheries (alternative to increasing fishing effort)?

Involvement of fishers in dynamic collective actions makes them more resistant when facing new constraints. In the context of declining small-scale fisheries, some forms of resistance can be identified for diversification as activities that are “outside the well established routines” [14]. Diversification collectively contributes to create new spaces for innovation. Resources, time and space are limited in fishing; the market is oriented on modern-fisheries that offer lower prices and increased quantity, but also a steady offer. In this context, small-scale fisheries develop resistance by creating space for innovation and *“constructed autonomy that allows for the introduction of alterations, innovations, new interrelations and artifacts, in short: the introduction of a wide range of new responses into the spaces of production”* [14].

Perspectives

Looking at the opportunity of developing diversification activities, fishers quoted that the main constraints is represented by regulations. In France, a clarification of regulatory texts concerning the diversification activities status is required to allow and encourage changes. To cope with the fisheries crisis, the diversification strategy that is based on dynamic strategies could contribute both to maintain fisheries and contribute to an integrated coastal zone management. This could be a part of a general discussion on integrated maritime policies at European or national scale, but also at local scale.

For example, the new Priority Axis 4 of the European Fisheries Fund (EFF) provides support for the sustainable development of fisheries areas. “Support for diversification” constitutes the second objective mentioned in Axis 4. It generally involves working to improve the linkages between fisheries and other economic sectors rather than linkages within the fisheries supply chain as in the previous section. An important innovation in the implementation of Axis 4 is the emphasis on the territorial approach, which encourages a focus on specific areas and seeks to mobilise local actors from all sectors: public, private and civil society, to work together as “groups” to design and implement integrated local development strategies.

CONCLUSION

The diversification activities presented here are the result of fishers of an innovative initiative to cope with new challenges. They represent a potential response that does not lead to an increase in catches, but instead contribute to maintain or decrease fishing effort and pressures on the environment. Moreover, they enhance responsible fishing practices by involving fishers in preservation and ecological activities. Finally, they facilitate and encourage co-expertise development towards resources and marine ecosystems management.

Apart from the demands from fishers, other conditions are needed to go with diversification activities development and durability of fisheries: i.e. the integration of these activities into a territorial dynamic. Up to now, fishing activities were taking place from the coastline to the high seas, which means a strong rupture between the place of work: the sea, and the living place: the land. However, most diversification activities are based on land and need to be supported by a terrestrial organization. These activities could provide a way to transcend this rupture between land and seas by involving fishers in newer logics than the maritime ones. Implementing many diversification activities enhances new economic dynamics on the coastal zone. Yet, these new dynamics need to be strongly attached to the territorial specificities and local populations they will depend on. For example, fishers are more willing to develop blue tourism in areas with a strong tourism potential does exist. Tourist activities by fishers can also reinforce an existing offer and benefits from existing demand. These complementarities between two different economic sectors enhance new relations between different actors – fisheries and tourism actors – towards a local collective project. In the same way, the promotion of sea products through brand, label or direct selling has to be established in link with local characteristics. To develop and secure the loyalty of clients, communication and quality promotion have to be developed through existing networks (local newspapers, radio, displays, among others). These actions reinforce fishers’ anchorage in coastal zones and help their integration in territories evolution.

Fishers who want to set up diversification activities have to move from a mono-disciplinary approach focused only upon production toward an integrated approach including all territories and opportunities. The relation between fishing production activity and its continuation on coastal lands can become an advantage and a strategy for integrated development of fisheries and coastal zones. This concomitant development reinforces an existing network or works as an incentive to build one new network. The existence of such social and technical networks are crucial for ensuring

the sustainability of social and economic systems as shown by other authors [2, 3, 4]. Considering diversity and intensity of coastal uses, fishers have to develop collective actions to be recognized, legitimated and to defend their own interests in front of various pressures. Diversification enhances an opening of fishers' competences (sellers, environment "sentinel", etc.). Fishers are no more users but stakeholders of the coastal zone.

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