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Fostering Spatial Efficiency in the Marine Space, in a Socially Sustainable Way: Lessons Learnt From a Soft Multi-Use Assessment in the Mediterranean

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In a context of growing claim for marine space and in the pursuit of maritime "spatial efficiency," Multi-use (MU) becomes necessary to assemble more or less compatible sea uses. In this paper, the potential of the soft MU involving small-scale fisheries (SSF), tourism, and nature conservation related to marine protected areas (MPAs), widely encountered in the Mediterranean Sea basin, is being assessed in Greece. Despite the fact that the MU concept is not yet included neither in maritime spatial planning (MSP) laws nor in strategic policy documents due mainly to the dominance of terrestrial spatial plans that favor exclusive rights of highly competitive and expansive maritime activities (e.g., aquaculture), the above MU is increasingly being practiced by local communities as a socio-economic instrument (fishing tourism), able to be also occasionally oriented to nature conservation. Following the Drivers, Added Values, Barriers and Negative Impacts (DABI) analysis, a spectrum of challenges/constraints and opportunities for the application of the MU under study was revealed, grouped in socio-economic, environmental, political–regulatory, and technological factors that can enable or undermine this MU in the Greek seas. The paper concludes that there is a huge potential for the said MU development in areas dependent on fisheries, consistently to the longstanding SSF tradition that despite its decline, continues to be one of the most important among those practiced in the coastal zone and in remote and insular communities, essentially defining their particular social and cultural identity. Besides, SSF have low environmental impact, and also tourists and the local communities are gradually becoming more conservation-oriented. Hence, the MU is highlighted as a tool for sustainable use of marine space supporting the Blue Growth Agenda and reconnecting natural and cultural capital at sea, thus redefining also the role of fishers that under equitable conditions may become defenders of marine biodiversity and key actors for the sustainable management of fish stocks and ecosystems in the protected areas.

Keywords: soft multi-use, spatial efficiency, fishing tourism, nature conservation, local development, equity, social sustainability, Greece

INTRODUCTION

Worries about incompatible claims for space, potential conflicts between emerging and traditional activities, and the pursuit of "spatial efficiency" in the marine space have generated voluminous analyses into the potential of Multi-use (hereinafter MU; Zaucha et al., 2016; Schultz-Zehden et al., 2018; Kyriazi et al., 2018; Bocci et al., 2019; Depellegrin et al., 2019; Onyango et al., 2020). Both the hard and soft MUs in the marine space have been investigated by several projects (Kyvelou and Ierapetritis, 2019a, p. 6), including the H2020 MUSES one, that exhaustively explored the opportunities for Multi-use Maritime Spatial Planning (hereinafter MSP) in the European seas that could guarantee innovation and a blue growth perspective, the barriers delaying the application of the MU concept (Onyango et al., 2020) and the answers to overcome barriers, reduce risks, and increase local benefits. MU is a complex process defined as the shared use of resources from a sole or multiple users in close geographic vicinity in the marine space and signifies a fundamental change of paradigm, passing from the "exclusive resource rights" to "the inclusive sharing of resources by one or multiple users." Soft MU groupings refer to "co-location" or "co-existence" of different uses when an existing infrastructure is applied without major adjustments and are mostly met in the South (e.g., in the Mediterranean), including soft and fleeting uses, such as recreation, small-scale fisheries (SSF), tourism, etc. (Bocci et al., 2019), whereas hard MU groupings apply to the incorporation of permanent infrastructural elements (e.g., MU platforms).

In this paper, the potential of soft MU involving SSF, tourism, and nature conservation, widely encountered in the Mediterranean Sea basin (Depellegrin et al., 2019), is being assessed in Greece. Despite the fact that in Greece, the MU concept is not yet included neither in MSP-related laws nor in strategic policy documents due mainly to the dominance of terrestrial spatial plans that favor the "exclusive rights" of extremely competitive and expansive maritime activities (e.g., aquaculture), the above MU is being practiced by local communities as a socio-economic instrument (fishing tourism), also able to be oriented to conservation, close or within marine protected areas (hereinafter MPAs). In fact, this is an SSF-driven unitentional combination of uses that may become a real and organized MU.

Small-scale fishing is an important activity in ecological, economic, and social terms in Greece. The country wields the largest share (23%) of the total European SSF (Macfadyen et al., 2011). Moreover, 35.4% of the Greek annual fish production is made by SSF (Hellenic Statistical Authority, 2020), and small-scale fishing provides 19,396 full-time jobs, highlighting Greece as the third country in the European Union (EU) in terms of employment in the industry. Most of these jobs are located in remote and insular territories (**Figure 1**), where there are usually no alternative livelihood opportunities and income sources. Although small-scale fishers make up 95% of the Greek fleet, they are only allowed for a small segment of fishing opportunities as they manage to access only 16.6% of the total consumers, thereby acquiring only a tiny fraction of the profits (Harris, 2016). While having a limited contribution to the Greek GDP (about 4%), SSF represent a sector of critical socio-economic importance for coastal and insular areas. It is often the main livelihood opportunity for many communities highly dependent on fisheries (Tzanatos et al., 2005). It is particularly important for communities settled in remote areas, such as small Aegean islands, where SSF activities are essential for the survival of coastal communities through the creation of small, often family-run businesses or self-employed workers, where the ship-owner is also the chief in the vessel (Lazou-Dean, 2014). However, overfishing, in combination with competition with amateur and retired fishermen, reduced catches value, and loss of consumer purchasing power–due also to the economic crisis and the concurrent austerity measures–are factors that increasingly shrink fishing income and push Greek fishermen either to abandon the activity or to seek opportunities of alternative or supplementary income sources. For all these reasons, Greek fishers are gradually acknowledging that their fishing activity should be broadened by aiming on innovation and diversification (FARNET, 2011; Nicolosi et al., 2015; Kyvelou and Ierapetritis, 2020).

This is besides a global trend consistent with gradually converting fisheries into tourism (European Parliament, 2016; Chen and Chang, 2017; Fabinyi, 2020). It occurs naturally, mostly due to the decay of income created by traditional fisheries, obliging fishers to pursue alternatives by engaging in marine tourism activities. Nevertheless, these alternatives are not evident. Le Gouvello et al. (2017) mentioned that a study on marine livelihoods showed that even most of the fishers were willing to pursue other activities than fishing *per se*, and that 56% stated that they envisaged no other alternatives to fishing for ensuring food or income. Besides, it is also reported (Thanh, 2020) that in some cases and localities, the alternative livelihood goal of tourism has failed, and tourism could only act as a supplementary income rather than an alternative livelihood.

However, and probably as a kind of response to the increasing competition fisheries are facing in the Mediterranean, a more organized co-existence of the three uses (SSF, tourism, and environmental protection) is encountered both in the Western Mediterranean Sea basin (Spain, France, Malta) and in the Eastern as well (Italy, Greece) (Depellegrin et al., 2019). Especially in the Adriatic Sea where fishing tourism is extremely developed, fishing is facing great rivalry with fishing areas are foreseen to decrease in the near future, due to conflicts between fisheries and other competitive sectors. These vary from the oil and gas industry, the renewable energy, and the maritime transport to the aquaculture sector, which is rapidly expanding to the detriment of fisheries especially in the coastal zone. Conflicts may arise also between fisheries and the MPAs, which are expected to increase in size in the coming years, if the Aichi targets are maintained and also due to the new biodiversity Strategy 2030 (European Commission, 2020, Biodiversity Strategy 2030). Of course, the adoption of sustainable fishing practices is considered promising and capable for providing an alternative for fishers and ensure a win–win and sustainable assemblage for both fishing and tourism activities (Gomei and Bellia, 2019).

In this context, the soft MU under study, whose potential was poorly assessed to date, is being in-depth examined in Greece

with the aim to highlight its relevance as a socio-economic instrument (Kyvelou and Ierapetritis, 2020), providing an income stream for the fishers and the local community while preserving the environment and raising awareness on how to protect and safeguard the marine environment and the marine biodiversity.

As assessment methodology, the Drivers, Added Values, Barriers and Negative Impacts (DABI) method was chosen, inspired by the "Drivers, Pressures, State, Impact, and Response" model of intervention (DPSIR framework), including a scoring system distinguishing factors that refer to the DABI. The DABI was initially developed within the MUSES Project (Zaucha et al., 2016), which, in order to understand the MU key opportunities and challenges involved at different levels, engaged national and local stakeholders in scoring exercises to determine the DABI of selected MUs. From this, the MU potential was calculated as the average of drivers and barriers, whereas the MU effect was estimated as the average of added values and negative impacts. Since its first development, the DABI method has been widely used in several MU-related articles to assess their potemtial (Kyriazi et al., 2018; Depellegrin et al., 2019; Bocci et al., 2019; Onyango et al., 2020).

THE STATUS QUO OF THE MU

About Fishing and Tourism Combination

The MU under study initially involves professional fishers (mainly small-scale) hosting tourists on their fishing vessels to realize and become familiar with local fishing traditions. It principally implicates the combination of fisheries and tourism, otherwise branded as "pescatourism" with some form of environmental protection including conservation, education, and sustainability measures that are applied during fishing tourism activities. Fishing tourism has a rather long history with the term coming out in Italy in 1992 and firstly included in the Italian legislation to indicate the boarding of non-fishers adults, aged over 14, on fishing boats with a recreational, educational, or tourism commitment (Piasecki et al., 2016). Currently, fishing tourism is developed in various Mediterranean countries as an alternative to coastal tourism (Lai et al., 2016; Prosperi et al., 2019) comprising the provision of services usually by small-scale fishers, who welcome tourists on their vessels in order to make them familiar to the local fishing tradition together with educational and recreational activities.

The contribution of fishing tourism to the local development of European coastal areas is critical. It is a kind of alternative tourism based on traditional activities, attracting visitors looking for authentic experiences linked also to marine intangible heritage, such as artisanal fishing practices (FARNET, 2014). Through the development of this locally provided tourism product, the local tourism businesses and the local labor market are upgraded (Prosperi et al., 2019), while at the same time, an additional income stream is created locally for fishers/entrepreneurs and the local community. In fact, they can exploit their already available skills and means and develop new activities offering educational and/or recreational services to tourists. Moreover, they may expand the additional income sources by offering hospitality services to the tourists aspiring to spend one or more days at the fisherman's residence and participate in their everyday life (formulation of fishery harvests for trading, setting up the fishing gears, and housework in general). This is a type of tourism package usually provided in the Italian coastal zones, referred to as "itti-turismo" (Piasecki et al., 2016). The advantages of fishing tourism for the fishing income also include the expected increase in local demand for locally caught fish, which are put up for sale to the retail market, restaurants, etc.

The effort of intentionally stimulating local development through fishing-related regional policy features has been alive for more than three decades already through both the PESCA initiative[1] that emerged in 1994 (European Commission, 1994) and the Fisheries Local Action Groups (FLAGs) initiated by the European Fisheries Fund (EFF) in 2007. In other words, fisheries policy introduced regional policy features by promoting local development projects indirectly related to the fishing industry, such as fishing tourism, gastronomic activities, fisheries related to arts and crafts, relevant museums, vocational training for fish workers, etc. FLAGs are co-management schemes (Linke and Bruckmeier, 2015) encouraging sustainable development and improving the quality of life in coastal areas with a noteworthy (though declining) fishing activity. Through FLAGs, fishers and harvesting industries are expected to become key drivers of a Community-Led Local Development (CLLD), where local communities are given incentives to form multi-sectoral partnerships to stimulate economic, social, and environmental development. In 2018, there were 367 FLAGs already established across 20 European Member States, each of them realizing a CLLD strategy by funding a series of projects to address local priorities (Freeman et al., 2018). The FLAGs initiative gave new impetus to local development and to the endeavor to inverse the decay of the fishing sector.

However, distress of the Mediterranean coastal and island communities, because of the weak economic performance of the fishing industry, seems hard to reverse. Answers may be found to the spillover effect of innovation, best practice, and expertise that may produce new territorial potentials in areas facing similar constraints. In order for FLAGs to have a catalytic role in such spillover procedures, a territorial vision is needed, structured around a place-based and bottom-up approach against a sectorial vision oriented to the fisheries sector *per se*. Of course, the stakes for FLAGs are not only to decouple local communities and the harvesting activity (Gallizioli, 2014), but essentially boost "territorial cohesion" by exploiting the "territorial capital" (Kyvelou, 2010) of fishery-dependent zones.

Studied as an organized MU by Bocci et al. (2019) in a series of European seas, fishing and tourism combination is found to provide many added values, such as (a) economic ones both for fishers and for the local economy, through an anticipated growth of commercialization of local fish products; (b) social ones since a growth of operators involved in the activity was detected with parallel increase of skill and management capacities; and (c) environmental ones that is either raising awareness for tourists and civil society on issues related to conservation of the marine environment and fisheries or possible influence to the sustainable

management of fisheries and the ease of tourism pressures in the coastal zone.

Associating Fishing Tourism With Environmental Protection: Reconnecting Natural and Cultural Capital in the Marine Space?

As already mentioned, Depellegrin et al. (2019) reported a solid association of fishing tourism activities with environmental protection in the Euro-Mediterranean Sea basin: either as fishing tourism activity taking place in proximity or within MPAs (Badalamenti et al., 2000; Milazzo et al., 2002; Horta e Costa et al., 2016) or by endorsing initiatives dedicated to environmental education or even by actively implementing environmental protection measures. Thus, raising awareness on marine ecosystems' deterioration and protection of the biodiversity, consideration of sustainability principles, information on marine litter and "ghost fishing" and on existing rules, such as the Marine Strategy Framework Directive, collection and management of marine litter, or rejected fishing gears by the fishers themselves are some of the possible initiatives to be undertaken.

The above observations are theoretically extremely interesting as far as social-, economic-, cultural-, and conservation-related objectives may co-exist in the marine environment. Kyvelou and Ierapetritis (2019a) introduced the term "maritime cohesion" for such an integrated and assemblage thinking-related approach in MSP. The suggestion that MPAs should generate win–win outcomes for conservation and development, thus fulfilling expectations of ecologists, governments, fishers, tourism industry, and local communities, is becoming, according to Bennett and Dearden (2014) the dominant theoretical paradigm even if the issue is more complex in practice. MPAs can be embedded in a framework of "maritime cohesion" since though the conservation of marine biodiversity is commonly considered as their primary objective, ignoring their social, cultural, and economic impacts has often led to humble local acceptance, if not direct opposition (Badalamenti et al., 2000) and positive local development outcomes are also a prerequisite of local acceptance and support for these initiatives (Bennett and Dearden, 2014).

Evidence on the interactions, either synergistic or conflicting, between fisheries, tourism, and MPAs can be often found in the literature. For example, as indicated by Lopes et al. (2015), exploring interactions between fisheries, tourism, and MPAs in South-East Brazil, tourism in allowed areas outside the MPAs has aided both fisheries and biodiversity conservation by reducing the time and effort that fishers allocate to fishing and by attracting tourists for wildlife observation. Of course, this is not always the case, and the compatibility of these uses is rather conditional. Papageorgiou (2016), examining interactions of coastal and marine tourism with other human uses, mentioned that tourism is conditionally compatible with MPAs and coastal protected areas. There is also evidence that MPAs have more favorable effects on marine resources and fisheries when coupled with no-take areas, artificial reefs, and other fishing regulations. Even if a very low percentage of MPAs is rigorously managed by permanent no-take areas, world-wide research progressively encourages no-take areas since they are considered advantageous for fisheries due mainly to their spillover effect that is the export of the increasing biomass toward bordering zones where fishing is allowed (Goñi et al., 2008; Bennett and Dearden, 2014).

However, associating fishing tourism with conservation will mostly depend on local perceptions and understandings of "conservation" (Oracion Enrique et al., 2005) and mainly willingness of support of conservation measures (incl.MPAs). Brennan (2018), conducting an empirical research in a small Scottish island community, argues that local understandings and experiences of the meaning of "conservation" showed that this is inextricably linked with a human value system that shapes, and is shaped by, the natural environment. Besides, during the last few decades, a changing understanding of conservation is taking place, with our perception on the relationship between people and the environment progressively so changing. Earlier to the 1960s, humans were considered separate from their surrounding environment, and conservation was outlined as "nature for itself," with zones of wilderness sheltered away as reserves (Mace, 2014). However, this conservation-related "zoning" strategy turned to be quite inefficient (Pressey, 1994) and difficult to be governed (Beunen and Van Assche, 2013). Around the turn of the century, our perception of conservation evolved to "nature despite people," where the key concern was avoiding extinction and loss of species, then to "nature for people," since the value of ecosystem services (Millennium Ecosystem Assesment (MEA), 2005) was investigated, and finally, to "people and nature," where people are now considered as part of ecological systems (Mace, 2014). Hence, the emphasis is no longer on the isolated reserves, the so-called "islands" in a terrestrial or marine landscape. Instead, we rather agree on the necessity to generate shared landscapes between humans and nature, that is, social–ecological spaces, with strong focus on maintaining ecological processes, adaptability, and resilience (Dudley, 2008; Mace, 2014; Davoudi et al., 2016). Thus, a new perspective and relevant research considering people as being organically part of nature arises. This is besides consistent with both the European Landscape Convention ratified in 2000 (Kyvelou and Gourgiotis, 2019) and of the new concept and practice promoted by the EU of reconnecting nature and culture (Paracchini et al., 2018). The latter implicates that natural and cultural capital should be recognized, understood, planned, and managed together. Best practice in conservation is now understood to manage landscapes as social–ecological systems using multidisciplinary processes aiming to achieve socio-economic and ecological objectives in an open, fair and transparent way (Ban et al., 2013). Recognized reserves are still and probably will remain a conservation tool, but there is a lot of discussion on how these can improve their economic and social impact. The latter is particularly important for policies regarding MPAs but also for mixed, MU marine landscapes viewed as social products that are cultural projections of a society in a particular territory from a tangible, intangible, and symbolic viewpoint.

Social and Cultural Implications

A precious endorsement (yet not promptly manifest) of the fishing tourism-driven MU to local development is the

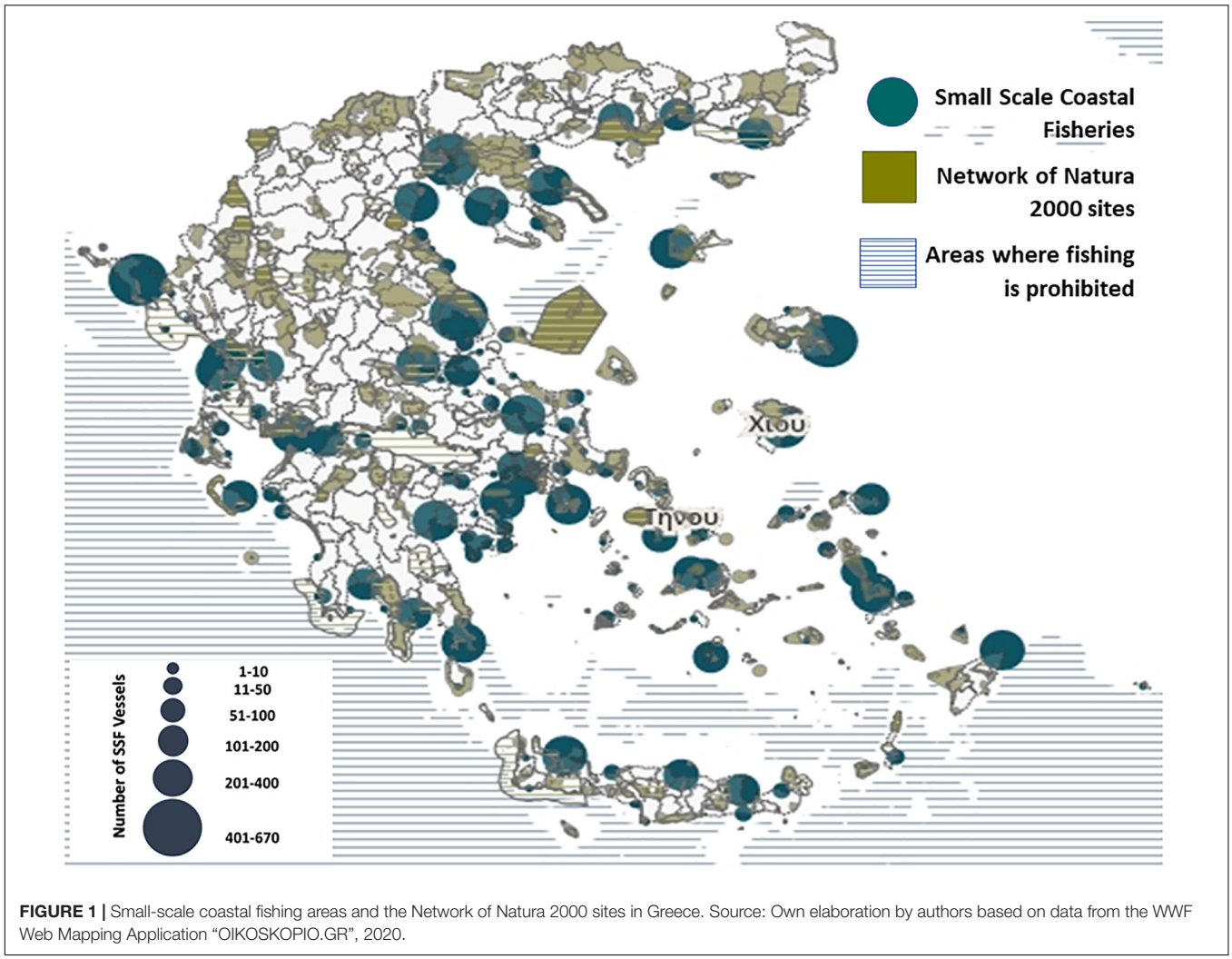

FIGURE 1 | Small-scale coastal fishing areas and the Network of Natura 2000 sites in Greece. Source: Own elaboration by authors based on data from the WWF Web Mapping Application "OIKOSKOPIO.GR", 2020.

enrichment of the social status and the local identity of the fishers themselves. One should not forget that fishers are a poorly represented professional group that has limited possibilities to sustain its claims, thus risking being ignored and marginalized in the planning and development processes (Jentoft and Knol, 2014). Fostering social status and local influence of fishers may contribute to enhance also their participation in maritime events including MSP processes (Kyvelou, 2020). In any case, the diversification of the fishing activity through tourism and nature conservation enlarges their role in the consultation and planning of tourism and environmental development strategies or initiatives for their coastal/island area (European Commission, 2013).

Besides, bringing tourists very close to the fishers' daily life and traditions and promoting their awareness on nature conservation may lead to a common vision between tourists and local people. Residents are usually inspired in safeguarding their living environment, in terms of ecological, economic, social, or cultural properties, preventing or moderating damaging tourism impacts, whereas tourists are given the opportunity to uncover geography, local culture, sense of places, landscapes, and seascapes through direct attachment to a longstanding traditional endeavor of the Mediterranean coastal and island communities. Fishing is linked with all facets of culture, stimulating a whole set of intergenerational knowledge, abilities, and practices (de Madariaga and del Hoyo, 2019). In other words, the MU under study has a strong cultural dimension and promotes the nexus between conservation and sustainable use of the heritage to the benefit of local populations. Fostering cultural views and experiences by tourists builds also cautiousness for natural and cultural heritage, both tangible and intangible. This may also empower them in essentially being part of the conservation processes, thus sharing a favorable for the environment, learning procedure.

Fishing Tourism Intensity, Status of MPAs, and the Perspectives of MU in Greece

Fishing tourism, considerably developed over the last two decades in Italy, is now gaining ground in other Mediterranean locations as well. In Greece, although there are indications that

fishing tourism is away from being fully guaranteed (Kyvelou and Ierapetritis, 2020), positive perspectives seem to be erased in the search to diversify the declining coastal SSF activity. According to the latest available data[2], formally licensed fishers exerting fishing tourism activity in Greece amount to 155. More than one-third of the total is concentrated in the South Aegean Region (50 fishers) due to its specific regional assets, such as the longstanding artisanal fisheries tradition and the high performance in attracting tourism flows. Licenses are distributed in the biggest and highly touristic islands. Then, the region of Crete (22 fishers) follows, making up 14.2% of the total distributed all over the island. The third pole is the region of Attica (16 fishers), which makes up 10.3% of the total, whereas in the fourth and fifth positions are the region of Thessaly (7.7%) and the region of East Macedonia and Thrace (7.1%). The visitors usually come either from other European countries (mainly from the Nordics, France, Italy, Germany, and Bulgaria) or from United States, Russia, Israel, and the United Arab Emirates.

Besides, up to date, three MPAs with respective spatial management plans were established in Greece: the Zakynthos Marine Park in the Ionian sea, established for the protection of the marine turtle *Caretta caretta*, the Alonissos Marine Park in the Aegean Sea for the conservation of the Mediterranean monk seal *Monachus monachus*, and the most recent MPA of the island of Gyaros and its surrounding marine area (PHAROS4MPAS, 2019). In the MPAs, there is explicit zoning of specific maritime activities indicating various protection levels according to the foreseen biodiversity conservation objectives. In 2018, the country has also enlarged the designation of its marine Natura 2000 sites (**Figure 1**). However, as it happens also for quite a lot of Natura 2020 sites all over Europe (Vassilopoulou et al., 2020), the Greek sites remain "paper parks" (WWF, 2017). It is thus essential for the designation of MPAs in the European seas to establish efficient conservation planning principles rooted also in the MSP process.

On the other hand, the perspectives of MU in Greece are rather random. No legal or policy document related to MSP exists, making explicit reference to the MU concept. The existing laws on MSP (namely, the initial law 4546/2018 issued in compliance to the MSP European Directive and the recent law 4759/2020 including a whole chapter amending the previous legislation on MSP and essentially excluding the coastal space from maritime spatial plans) are completely ignoring the concept. However, in practice, there exist several initiatives seeking to implement the co-existence of sea uses in an organized and coordinated way. This is, for example, the case of a private initiative in Western Rhodes (namely, the Blutopia marine park) that is seeking to implement the symbiosis of aquaculture with diving tourism activities, thus linking also conservation of certain species with tourism activities (Sadovy de Mitcheson et al., 2020).

This exclusion of the MU concept from Greek marine strategies and regulations is mainly due to the dominance of terrestrial spatial plans that favor exclusive rights of certain maritime activities that are extremely competitive and expansive (e.g., aquaculture). For example, the sectorial Special Spatial Planning Framework for Aquaculture (2011) combined with other provisions (such as the Law 2742, 1999 issued in compliance to the ESDP) promotes zoning of the sea allocated to aquaculture (allocated zones to aquaculture, AZA, in Greek POAY) with the aim to avoid any interference with potential conflicting activities, thus receiving a lot of criticism by various stakeholders, including SSF, the tourism industry, and the local authorities especially in highly touristic areas and areas with sensible marine and coastal ecosystems. In addition, the equally sectorial territorial plan "Special Spatial Framework for Tourism" distinguishes coastal areas into "developed" and "under development" ones, and a series of exclusions exists varying from no-take areas to spatio-temporal bans for the fisheries sector, especially for trawling and purse seiners.

MATERIALS AND METHODS

Research Methodology

The methodological approach used to carry out the research is presented in **Figure 2** and is analyzed in four steps as follows:

Step 1: Literature Review

At the beginning, a literature review on the status of fishing–tourism (F–T) and fishing–tourism–nature conservation (F–T–NC) combinations was conducted, including scientific literature, policy documents, strategies, laws and regulations at the national and regional levels, and national and international projects relevant for the specific type of MU. Information was also collected through stakeholders' websites, reports, or documents. The review aimed to identify the following:

- Locations where the MU (SSF–tourism–nature conservation) is implemented;
- Identification of the involved stakeholders, public, private, or collective bodies, enterprises, fishers, academia, and individuals;
- Recognition and analysis of the MU status on both the regional and local levels;
- Identification of contributing factors as Drivers, Added Values, Barriers and Impacts, that can promote or constrain the MU development;
- Thorough description of contributing factors as Drivers, Added Values, Barriers and Impacts that can promote or constrain the MU, respectively.

Step 2: Research Question Development

As regards the individual factors of the DABI analytical framework, DRIVERS are the factors promoting/supporting/facilitating/strengthening MU development. BARRIERS are the factors hindering MU, that is, preventing/negatively affecting MU. On the other hand, ADDED VALUES are the positive effects/impacts of establishing or strengthening MU, that is, the pros or the benefits or the positive effects of implementing/strengthening MU. IMPACTS are the negative effects/impacts of establishing or strengthening MU, in other words, the cons or the negative effects of implementing/strengthening MU. Besides, MU potential is defined as the degree of opportunity the study area has to develop or strengthen MU, and MU effect is defined as the overall result or balance of pros and cons of developing MU in the study area (Zaucha et al., 2016). Furthermore, the DABI

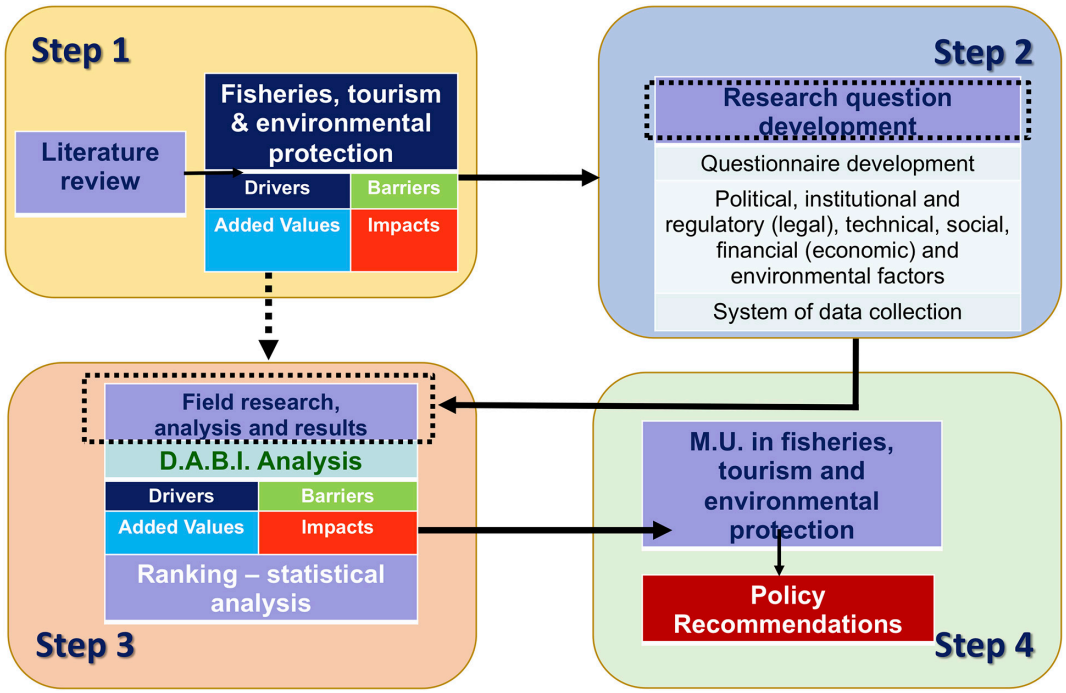

FIGURE 2 | The research methodology. Source: Own elaboration by the authors.

analysis is grouping the factors that stimulate and/or hamper MU development into political, institutional, regulatory, technical, social, economic/financial, and environmental. Thus, the current research was designed, taking the following actions:

- An online survey was designed connected to a first data collection and processing system.
- Factors for each DABI group were analyzed and further categorized into several categories:
  - political/regulatory (legal, administrative, and institutional);
  - social;
  - technical;
  - economic/financial;
  - environmental.
- A fully structured questionnaire was created under the general topic of "Investigation of the MU application, in Greece," with closed and opened questions that included at first, institutional information regarding the type of stakeholder. Second, it included closed questions, such as "On your opinion, what are the main strengths/advantages of the coexistence of fishing–tourism–nature conservation?" or "On your opinion, what are the most important challenges/disadvantages in the coexistence of the sea uses under study?". Third it included opened questions, such as "In what ways do you think the MU 'SSF–tourism–nature conservation' could be further developed in Greece?" or "Mention any other possible thoughts/ideas/opinions about the factors that hinder the development of the MU". Closed questions were designed for the DABI to be answered by a five-point Likert scale, as follows: 1—absent, 2—not relevant, 3—low priority, 4—very important, and 5—extremely important.

Step 3: Field Research Analysis and Results

The online survey was conducted mainly between December 2019 and February 2020 addressing a total of 40 stakeholders. It was designed to be highly representative that is multi-level (including stakeholders from national, regional, and local decision-makers) and multi-actor (government institutions, co-management schemes, such as Fisheries Local Action Groups, NGOs, collective bodies of fishers, academia, experts, individual fishers, tourism industry) (see **Table 1**).

The purpose was to identify and highlight a list of factors linked to the MU under study, and this was accomplished through the following actions:

- Stakeholders engaged to the online survey by evaluating and scoring each DABI factor, identifying additional factors presented in the opened questions, and suggesting actions to promote the soft MU (SSF–tourism–nature conservation);
- Results came up after the automatic first data collection and processing;
- Tables and diagrams relevant to the field research were created using:
  - red color for the political/regulatory (legal, administrative, and institutional) factors;
  - light blue color for the social factors;

TABLE 1 | Breakdown of stakeholders that participated in the research.

Background	Number of stakeholders	% of participating stakeholders
Individual fishers	10	25.0
Fishers' unions	1	2.5
State–ministries–government agencies	4	10.0
Science–academia	4	10.0
Independent experts	5	12.5
Municipalities	1	2.5
Development agencies	5	12.5
Fisheries Local Action Groups (FLAGs)	6	15.0
Environmental NGOs	2	5.0
Tourism enterprises	2	5.0
	40	100.00

  - dark blue color for the technical factors.
  - orange color for the economic/financial factors;
  - light green color for the environmental factors (cf. Tables in the Appendix).

- Finally, answers to the open question "Mention any other possible thoughts/ideas/opinions about the factors that favor or hinder the development of the MU" were also assessed and presented.

Step 4: Conclusions and Policy Recommendations

Following an evaluation of the results of the online survey and using the DABI factor analysis, a series of the DABI concerning "fisheries–tourism–nature conservation" development as a soft MU in the marine space was highlighted and analyzed (cf. **Table 2**). The evaluation of these results led to concrete policy recommendations for the promotion of the soft MU (SSF–tourism–nature conservation) in Greece.

THE RESULTS OF THE RESEARCH

The DABI results revealed a large spectrum of challenges/constraints (Barriers and Impacts) and opportunities (Drivers and Added Values) for the application of the MU under study (**Table 2** and **Supplementary Appendix Tables 1–8** in the), grouped in socio-economic, environmental, political–regulatory, and technological factors that can enable or undermine the MU of fisheries, tourism, and environmental protection in the Greek seas.

First of all, speaking about *Drivers*, key economic factors were revealed, such as the "networking with other tourist destinations to foster the alternative tourism product through synergetic marketing actions" (82.5% of the participants consider this factor to be extremely important to very important); the "EMFF funds related benefits for fishers concerning cultural fisheries, including tourism-based projects" (77.5% consider this factor to be extremely important to very important); as well as the "ability to establish an efficient (win–win–win) assemblage of fisheries–tourism–environmental protection within or close to MPAs" (77.5% consider this factor to be extremely important to very important). Follow the key social factors with particular importance among the "fishers' participation in planning and decision-making processes incl.MSP" (80.0% consider this factor to be extremely important to very important) and the "hosting of events related to local fishing traditions and relevant intangible heritage" (80.0% consider this factor to be extremely important to very important). The environmental and political–regulatory driving forces are rather limited and include the "environmental education/awareness raising of fishers and tourists within or close to MPAs" (75.0% consider this factor to be extremely important to very important) as well as the "amendment of the existing regulatory framework so as to enable the expansion of fishing tourism activities to recreational and cultural ones" (70.0% consider this factor extremely important to very important). Finally, a few technological factors were revealed, such as the "integration of innovation in fishing activities" and "familiarizing fishers with ICT and digital services such as fishing tourism platforms, etc." These two factors were considered extremely important to very important by 60.0 and 57.5% of the participants, respectively (**Supplementary Appendix Tables 1, 5**).

Supplementary Appendix Tables 2, 6 illustrates the types of *Added values* (positive effects/impacts) that arise from the development of MU for fisheries, tourism, and environmental protection, as these are perceived by the participants in the research. Similarly, with drivers, the economic/financial effects were considered as "added values" of paramount importance. The factors revealed, concern firstly, the "diversification of the artisanal fishing activities and the increase of the income of fishers" and, secondly, the "building of attractiveness of marine areas addressing to visitors and tourists seeking authentic experiences in conjunction with the development of niche tourism markets." Both types of added values are considered extremely important to very important positive effects by 85.0 and 82.5% of the participants, respectively. Similar importance is also attributed to environmental and social effects: 85.0% of the respondents understand as extremely important to very important the "raising of awareness to environmental impacts related to sustainable fisheries (e.g., ghost fishing)," whereas 82.5% of them perceive the "job creation and social cohesion in coastal and insular communities depending on fishing activities" as key added value. On the other hand, less weight is attributed to some other positive social effects, such as the fact that fishing tourism-driven MU allows "fishers to play a major role in safeguarding and promoting their cultural identity" (75.0% consider this to be extremely important to very important). Moreover, as positive economic effects were perceived the "promotion of branded local agricultural products" with 75.0% of the respondents endorsing this factor as extremely important to very important and the "further involvement of SSF vessels in environmental activities" with 71% accordingly.

With respect to the main *Barriers* to the development of the marine MU under study, the anonymous questionnaire revealed that these are mainly social and political–regulatory barriers rather than economic barriers or barriers of other nature (see **Supplementary Appendix Tables 3, 7**). More specifically, there are inherent weaknesses in local and rural entrepreneurship

TABLE 2 | The MU fisheries/tourism/environmental protection in Greece, DABI.

Drivers	Barriers
Policy/regulations	**Policy/regulations**
• Subsidies for further diversification of the fishing activity and the decrease of fishing effort	• Weakness of public authorities to support local entrepreneurship in coastal/insular areas
Amending the regulatory framework to enable recreational and cultural tourism activities	• EU compensations to fishers for destructing traditional vessels and quitting fishing activity
	• Equal taxation of traditional boats with modern, higher speed yachts of similar length
	• Delays in the physical and economic completion of CLLD and the relevant OP measures on fishery for 2014–2020
	• Regulatory framework shortages for developing fishing tourism in inland waters where fisheries is the main income source
Socio-economic	**Socio-economic**
• Networking with other tourist destinations to foster this alternative tourism product	• Lack of training programs for fishing and traditional shipbuilding
• Events on fishing tradition/intangible heritage	• Low attraction of special groups of tourists (e.g., vegetarian/vegan or other similar groups)
• Enabling fishers to benefit from EMFF funds incl. cultural fisheries and tourism-based projects	• High seasonality of fishing tourism activities
• Enabling the assemblage of fisheries, tourism, and conservation targets (through MPAs)	• Lack of entrepreneurial culture
• Fishers' participation in planning and decision-making processes incl.MSP (S)	
Technological	**Technological**
• Familiarizing fishermen with digital services (fishing tourism platforms, etc.)	• Aging of the Greek fishing vessels
• Incorporation of innovation in fishing activities	
• Retail sales infrastructure in ports and fishing shelters in touristic areas	
Environmental	
• Decrease of fishing effort as a means to cope with overfishing	
• Environmental education/awareness raising within or close to MPAs	
Added values	
Socio-economic	
• Diversification of traditional fishing activities and increase of fishers' income	
• Increase of employment and social coherence in coastal and insular communities depending on fisheries	
• Attracting and maintaining young people in the fisher's profession	
• Attraction of visitors seeking authentic experiences—development of niche tourism markets	
• Promotion of branded local agricultural products	
• Major role of fishers in safeguarding and promoting their cultural identity	
Environmental	
• Opportunity for the limited fish stocks to recover, by reducing fishing effort and by supporting MPAs	
• Raising awareness of tourists on issues related to the negative environmental impact of fishing (e.g., ghost fishing)	
• Further involvement of SSF vessels in environmental activities	
Impacts	
Socio-economic	
• Risk for fishers to lose compensation related to missed opportunities of fishing activities	
• Potentially increased competition by other professional groups (e.g., other local coastal tourism enterprises)	
• Risk of low tourist satisfaction due to the aging and low educational level of fishers and the lack of specialization of other workers	
Environmental	
• Environmental pollution/marine rubbish created by tourism activities (by non-informed tourists, etc.)	
Policy/regulations	
• Additional taxation for tourism activities, which makes the coexistence of fishing and tourism activities a non-viable business activity	
Technological	
• High investment cost for adapting the existing vessels to tourism activities (existing legal provisions)	

(Ierapetritis and Lagos, 2009, 2012; Ierapetritis et al., 2010) and a lack of business culture among small-scale fishers (77.0% of the research participants consider the above factors to be extremely important to very important barriers). The next most important barriers are regulatory deficiencies, such as the "incomplete existing regulatory framework ignoring the development of

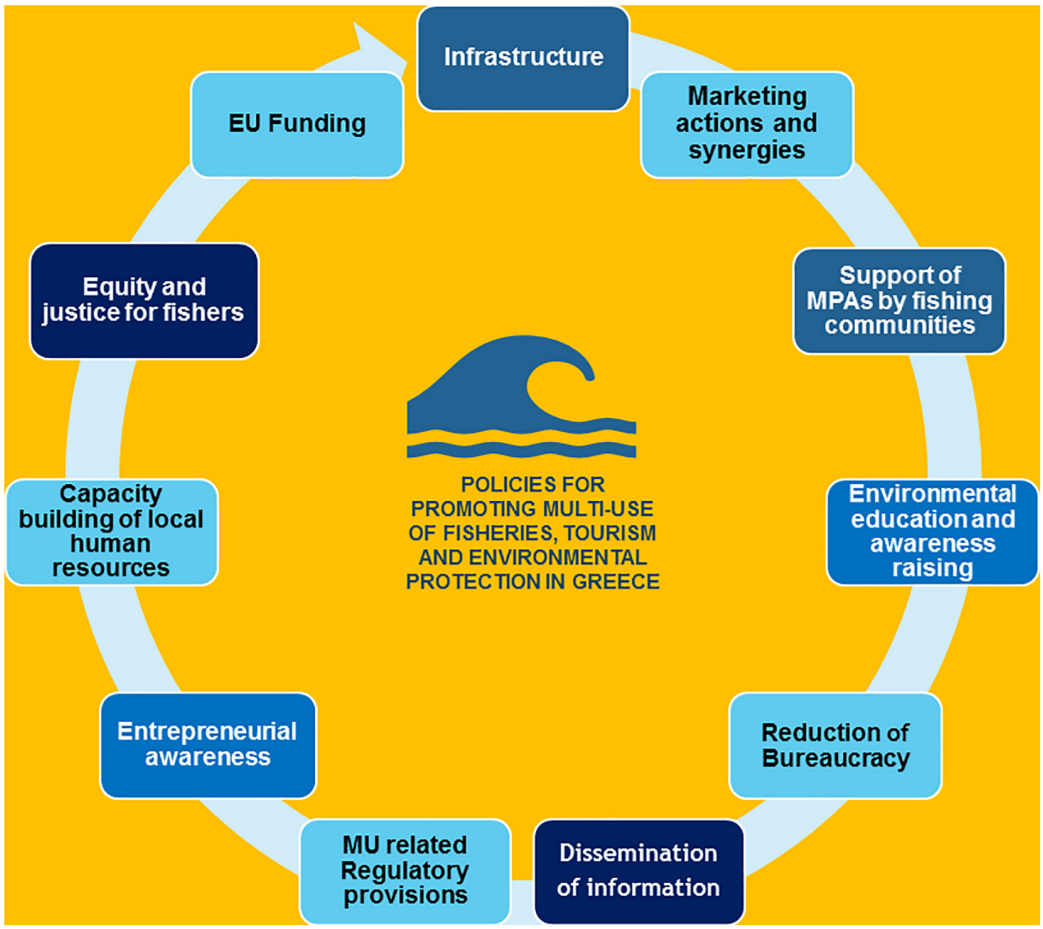

FIGURE 3 | Policy recommendations for MU of fisheries, tourism, and environmental protection in Greece.

fishing tourism in inland waters where fisheries is the main source of income" (75.0% consider this to be extremely important to very important) and the "traditional vessels are equally taxed with modern yachts of similar-size" (71.8% consider this to be extremely important to very important). Other inhibiting factors reported were the "lack of training programs for fisheries and traditional shipbuilding," the "destruction of traditional wooden fishing craft after receiving EU subsidies for revoked fishing licenses," and finally the "inability of public authorities to support local entrepreneurship in coastal regions and small inlands" (the above are the opinions of 69.3, 64.1, and 65.8% of the participants, respectively).

Moreover, a series of other factors that inhibit the development of an environmentally active fishing tourism was revealed. First, there is absolute lack of information about the concept of "multi-use" in the marine space and its specific implementation in fisheries or tourism-driven MUs. Second, objective weaknesses are the aging of crews in combination with the old age of vessels and the lack of the required equipment. Besides, the low educational level of fishers along with the lack of vocational training and fisheries certification combined with the absence of SSF unions and associations hampers the potential leading role and effective funding of fishers in the FLAGs. Fishers are often marginalized both in MSP processes (Jentoft and Knol, 2014) and within the FLAGs (Kyvelou, 2020). The small extent to which fishers create unions and associations reduces their political power when they stand up to support their interests, deal with common problems, and diffuse reliable, current information. On the other hand, fishers attribute limited interest on the opportunities to expand and diversify their fishing activities mainly due to the lack of information and training. Limited interest may also be attributed to their deepest fear of abandoning their fishing activity that has multiple meanings for their life and their relationship with nature, if income from non-fishing activities becomes more attractive.

Many negative *Impacts* are due to the ambiguous regulatory framework, especially with regard to taxation issues and issues related to water navigation, allowing an uneven treatment of fishers in behalf of local tax and revenue and/or coastguard officials. The existing regulatory framework for fishing tourism generates injustices, allowing an unfair competition between small-scale coastal fishers and tourism institutions and/or private luxurious leisure boat owners. The latter profit from digital advertising to offer their services in lower prices. Still, their

services do not meet client expectations as they lack both the experience in the sea and mainly the traditional fishing know-how. Furthermore, fishing tourism faces promotional deficiencies, since promotion is often based on individual initiatives. There are finally cross-border conflicts between Greek fishing boats and Turkish vessels (e.g., in the Southern Aegean) and specific weather conditions (e.g., the "meltemi" summer winds in the Aegean Sea, North Crete, etc.) that intrude time- and space-related shortages to the fishing tourism product. Summing up, the participating stakeholders indicated as the most important negative *Impacts*, in other words, discouraging factors for the development of the MU under study (a) the demand of high investments for the adjustment of fishing boats to the standards required for tourism activity, (b) the risk of low tourist satisfaction due to the aging and low educational level of fishers in combination with a certain lack of specialization of their human resources, and (c) the possible negative Impacts of tourism activities on MPAs (e.g., sea rubbish). The above factors are considered to be extremely important to very important by 70.0, 58.9, and 48.7% of the respondents, respectively (see **Supplementary Appendix Table 4, 8**).

DISCUSSION AND RECOMMENDATIONS

The Pros

The DABI analysis revealed that major Driving forces enabling the MU "fisheries–tourism–nature conservation" in Greek marine space are primarily socio-economic factors and secondarily factors of environmental nature. This obviously reflects the prevalence and urgency of the MU as a socio-economic instrument, due to the need of artisanal fishers to cope with the decline of their activity, rather than serve conservation objectives that are controversial in terms of their effectiveness in increasing fish stocks. However, the respondents made reference (with less weighing, though) to conservation objectives, such as the environmental education and awareness raising about marine conservation of both fishers and tourists within or close to MPAs, the need to successfully overcome the "co-existence dilemma" and establish the three main features together, within or close to MPAs, and the understanding by fishers that there are benefits from the co-existence of their activity with tourism- and conservation-related actions, since MPAs can have several socio-economic benefits and mainly positive results to the recovery of the local fish populations. To the above, the promotion of the local traditional fishing culture, considered as a social factor able to enhance broader culturally significant local initiatives, was added. The development of this MU is expected to significantly increase the fishers' income through the diversification of their traditional activities, boost employment opportunities, and enhance social cohesion in coastal and insular communities dependent on fishing activities. It is also expected to increase the number of tourists that visit an area for enjoying authentic experiences and for its natural and intangible cultural heritage. This means that the locally offered tourism product may be enriched with a cultural and heritage dimension. In this way, the efficient assemblage of the three activities can reaffirm an emerging trend that views heritage and tourism as two reciprocally supported social phenomena that are co-produced (Gravari-Barbas, 2020). It is also expected that this MU development will serve equity and justice for fishers, increasing fishers' political power and their role in the protection and promotion of their cultural identity and tangible and intangible heritage. This is besides consistent to the "value-based approach" to cultural heritage management based on the Burra Charter (ICOMOS, 1999), which focuses on the values that society (consisting of various stakeholders) ascribes to heritage and places the community at the core of conservation. Raising awareness of both interior and foreign tourists to environmental issues related to non-sustainable fishing practices threatening the seas is also considered of paramount importance by the various stakeholders, while the above activities can also contribute to the promotion of branded local agricultural products.

The Cons

The most important potential *Barriers*/constraints are the lack of business culture within SSF and the absence of vocational training on fishing and traditional shipbuilding, which may support business initiatives and prevent the young generation from quitting the fishing activity. Key inhibiting factor is considered the existing legal framework that equates the taxation of traditional boats with modern, high speed yachts of similar size and ignores the opportunity of developing fishing tourism activities in inland waters. Further hindering factor is also the EU-funded destruction of traditional fishing boats (known as "kaikia" in Greek). As a result, between 2008 and 2017, small-scale fishing vessels have been diminished by 20% (Scientific, Technical and Economic Committee for Fisheries (STECF), 2019).

As *Impacts* were revealed, among others, the negative effect to the marine ecosystems, probably due to irrespective behaviors of tourists and fishers, the unaffordable financial burden for fishers, of the legally required technical adjustments of vessels as well as their age and low educational level that may make them inexpert to provide sufficient satisfaction to tourists. As for the effective combination of fisheries–tourism within MPAs, one should bear in mind that despite the fact that the need for "spatial efficiency" seems to be the most important driver in favor of MU, there is always a "coexistence dilemma" (Kyriazi et al., 2016) addressed differently in different areas. In most of the areas, there is no clear urgency for coexistence and therefore no dilemma. However, when fisheries–tourism–MPAs coexistence is pursued, the extent of absolute protection (e.g., no-take areas) is to be discussed to identify the appropriate compensatory measures. Hence, the potential of this MU has to be further thoroughly assessed to facilitate the decision-making concerning the eligibility of the option.

For the MU application to become commonplace and mainstream, policies and individual initiatives need to be taken in order to support fisheries' diversification *via* tourism and urge the update of the existing institutional framework. Especially, the latter should explicitly include the endorsement of MU in general, instead of promoting exclusive rights of certain marine activities, such as the aquaculture promoted by the AZA

mechanism (in Greek POAY). The MU framing in key policy documents, such as the National Strategy for the Marine Space (previewed by the MSP laws 4546/2018 and 4759/2020), is of paramount importance. Furthermore, clarifying and enhancing the regulations related to taxation and respecting the fair competition are absolutely necessary.

In terms of fishers' collective power, the establishment and operation of fishers' associations (cooperatives, producer organizations, trade unions, etc.) is to be supported, to increase the political impact and the inclusion of fishers in the planning and implementation of local strategies in MSP. Particularly significant for the support of fishing tourism is the provision of adequate information to local fishers on the perspectives and benefits of fishing tourism in combination with the preservation and promotion of their culinary knowledge, especially when their fishing excursions are combined with cooking the catches on the spot.

Another point is that fishing tourism destinations in Greece need promotional actions directed toward an international public fascinated by authentic experience and thematic tourism. On a local level, the organization of joint promotional actions with other tourist destinations of the area in combination with the organization of events for the promotion of particular fishing traditions (e.g., the fest of sardines) is expected to improve the position of each fishing tourism destination on the Greek thematic tourism market. Regarding the issue of environmental protection and biodiversity conservation, the creation of an effective mix of the triplet "fisheries–tourism–nature conservation" within or close to MPAs should be framed with environmental education and awareness raising actions provided that the above-mentioned "coexistence dilemma" is thoroughly taken into account.

A critical recommendation is to reduce bureaucracy and ensure available funding for the required technical investments in order to turn fishing boats into fishing tourism boats (imposed, besides, by the existing regulatory framework). This must be followed by supportive actions (marketing, networking, digitalization). Besides, developing skills and acquiring new knowledge by means of vocational training related to entrepreneurship, communication, tourism marketing, and new technologies along with training programs related to fisheries, shipbuilding, etc. is needed to strengthen fishers' will and ability to proceed to fishing tourism and other MU initiatives. Another recommendation is the upgrading and exploitation of the existing fishing shelters in order to create the required port infrastructures for fishing tourism vessels and the necessary port infrastructure for the establishment of a retail market for fish. In other words, an upgrade of the local business environment is absolutely necessary.

Last but not the least, much depends on the involvement of the main actors that is the fishers themselves. The research showed that equity and justice issues should be specially noticed, since fishers are a poorly represented professional group and risk being ignored and marginalized in the planning and development processes. Examining the degree of representation of professional groups in the FLAGs, using the example of the Attiki Island FLAG that corresponds to the seven island municipalities of Argosaronikos Gulf[3], covering 852 km^2 and a population of 74,651 inhabitants, it was found that even if the possibility exists for greater participation on behalf of the SSF representatives, for several reasons, fishers do not seem persuaded on the viability and the profit of such a participation. Their obvious distrust is mainly due to their incapacity to follow institutional and other developments, mainly resulting from their low educational level, restricted information, an impression that European policy is rather "hostile" toward them (due to the offering of incentives to abandon their activity and abolish their vessels), and the shortages concerning political support to SSF. In addition, the marginalization often experienced by individual fishers from other actors in the fishing community (e.g., municipal or port authorities) combined with the strict terms of participation imposed by the current institutional framework (e.g., asset and funds—source declaration) and the weak participative culture, all result in shortages of local support schemes to promote the diversification of the fishing activity toward MU settings.

CONCLUSION

Based on the 2012 Blue Growth Strategy (Kyvelou and Ierapetritis, 2019b) as well as related policies, strategies, and resources brought into play for its implementation, the view of the marine space is gradually shifting away from something simply to be safeguarded toward a place of opportunity and investment, both in traditional as well as emerging economic sectors. In this context, spatial efficiency in the marine context is a key pursuit, and the concept of MU is already acknowledged by researchers and policy makers as a tool to achieve an efficient and equitable co-existence or co-location of sea uses. In addition, the assessment of the different MU potentials is in progress all over the European sea basins. Specifically, the soft MU "fisheries–tourism–nature conservation" seems to be an option in the Mediterranean Sea basin where the need to diversify the fishing activity becomes a "*sine qua non*" condition especially for the survival and the non-marginalization of SSF due to the strong competition on behalf of the emerging blue growth activities (e.g., aquaculture) and the proliferation and expansion of the legally protected areas where fishing may be restricted or totally prohibited.

Following an assessment of its potential in Greece, the current article concludes that the policies and individual initiatives that need to be taken in order to ensure its viability touch upon external and internal to the fishing communities, priority axes (**Figure 3**). As external priorities can be considered regulatory measures, capacity building including information on business opportunities and on marketing actions, networking and synergies, reduction of bureaucracy, fostering funding opportunities, as well as improving relevant infrastructure. The most important, however, is the internal environment, that is, the willing involvement of the main actors that is the fishers themselves in the conservation, planning, and development processes (incl.MSP), and this raises justice and equity issues to be further placed under the research lens. Injustices do not, however, concern only fisheries and the other marine activities, they

also arise within the fisheries sector itself, specifically between professional and recreational fishing and between professional and artisanal fishing, where different gear types may overlap in some areas and where equity in financial- and tax-related terms is not ensured by the state. In conclusion, an increase of fishing-driven tourism and recreational activities is observed close or within the Mediterranean MPAs. However, the volume of research on their impacts is still limited. Further research is needed on the several options of the MU under study, and monitoring of the marine environment in MPAs is necessary, especially as a participatory process involving the fishers themselves, so as for them to be also convinced that the decrease in the intensity of fishing effort and the delimitation of MPAs where fishing is prohibited or restricted is definitely contributing to the recovery of local fish populations in the long term. MPAs, on their turn, become a precious fisheries management tool in addition to their conservation purposes. This will hopefully be a non-antagonistic relationship, a reconnection of nature and culture in the marine space to promote synergies instead of conflicts between humans and nature, redefining in a way the role of fishers that under equitable conditions may become not only fishing tourism entrepreneurs but also defenders of the marine ecosystems and key actors for the sustainable management of fish stocks and ecosystems in the protected areas. Finally, the mechanics of stimulating and rewarding fishers who participate in conservation efforts is another issue for further research.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

This research was carried out through an online questionnaire about the "Multi-use in the Greek seas and coastal and island communities" addressed to different stakeholders from a broad action arena related to blue economy and MSP. The respondents were given sufficient information about the goal of the research and consented to fill out the questionnaire, keeping their anonymity. The only information provided by them was the kind of the institution they work for (e.g., central government, government agencies, local authorities, fisheries association, consultancy, and academia).

AUTHOR CONTRIBUTIONS

Both authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fmars.2021.613721/full#supplementary-material

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