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Editorial: Coastal fisheries: emerging initiatives toward the sustainability objectives

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Editorial on the Research Topic

Coastal fisheries: emerging initiatives toward the sustainability objectives

Due to its location at the interface between terrestrial and marine domains, an increasing number of human activities are carried out in worldwide coastal seas. In addition to different fisheries, coastal seas are important for mariculture, but also for different recreational activities (Crossland et al., 2005). Despite growing anthropogenic impacts, coastal seas are key for the development of important ecological processes, sustaining much of the marine primary production due to nutrient inputs from rivers, enhancing complex food webs, and acting as nursery areas for many marine species, among others (Sherman and Duda, 1999).

Coastal fisheries, in particular Small-Scale Fisheries (SSF) such as commercial, including artisanal, and Marine Recreational Fisheries (MRF), are one of the most relevant coastal activities in terms of food provision, livelihoods, nutritional contribution, and cultural heritage. Therefore, in a context where different human activities are overlapping, understanding how different coastal fisheries interact and are effectively managed in accordance with sustainable principles is key to foster the resilience of these complex social-ecological systems (SES) (McClanahan et al., 2009) (Figure 1).

In this Research Topic we describe the results of 9 studies that contributed to moving coastal fisheries a step forward in their ecological, economical, and social sustainability.

The important role of MRF in the coastal areas was studied in 3 papers: Bachiller et al. analyzed the patterns of exploitation and impacts on marine living resources; Pita et al. analyzed the importance of MRF for regional economies; while its social relevance was addressed in Hamelin et al.

Bachiller et al. performed the first assessment MRF in the Basque Country (Eastern Cantabrian Sea), concluding that spearfishing population is the smallest (1 000 licenses), followed by boat fishers (5 000 licenses), with shore anglers more common (50 000 licenses). The main recreational fishery is carried out by boats operating during summer targeting albacore (*Thunnus alalunga*), which is also caught by commercial boats. The authors recommended developing an ecosystem management of fisheries, paying special



FIGURE 1
Image showing human activities in a coastal area created by using the Artificial Intelligence-based application *Photosonic* available at: <https://app.writesonic.com/es/photosonic>. The image was created by entering the keywords of this editorial: coastal seas, fisheries, aquaculture, leisure, impacts, blue economy, social-ecological systems, sustainability.

attention to the interactions between commercial SSF and recreational fisheries, and incorporating information from multiple species into the assessment models.

Pita et al. conducted an economic analysis of recreational fisheries developed by charter boats in the Eastern North Atlantic to assess their contribution to social welfare. The study described two case studies, one located in Galicia (NW Spain) and the other in the Madeira archipelago (Portugal). On average, the study showed that charter boats go fishing ~40 fishing journeys and take 2 500 anglers on board per year in Galicia, while in Madeira they fish about 64 journeys and take 3 200 anglers on board. The study also assessed the demand of recreational fishing trips showing that the visitor surplus mean value was € 1 385 per year in Galicia, and € 1 738 in Madeira. Furthermore, the study estimated that the social annual recreation value of Galician fishery was worth € 3.4 million, a value well below the annual economic impact generated by commercial fishing (€ 700 M). The recreation value of the charter boat fishery in Madeira, € 6.3 M, is comparable to the annual economic impact of commercial fishing that contributes to the local economy with € 12 M.

Hamelin et al. assessed the human dimensions of a Canadian recreational fishery targeting Atlantic mackerel (*Scomber scombrus*). The species has a high social and cultural value and traditionally has been under diverse fishing pressures exerted by commercial, bait, recreational, and indigenous fisheries. However, the current poor state of the stock only allows access to recreational fishers and indigenous harvest. The conclusions of the study highlighted that a greater involvement of recreational fishers in management models will promote local awareness and improve fisheries governance.

Different management measures for sustainable and resilient coastal SSF, including new perspectives, methods, and tools to

allocate fishing opportunities were explored in a group of three papers.

Villaseñor-Derbez et al. quantified the operational costs of community-based MPA monitoring programs in nine SSF communities in Mexico. The authors found that the annual monitoring costs represent between 0.3% and 55% of the extractive use value of the biomass contained in the MPAs. Therefore, the direct monetary benefits of community-based marine conservation can more than out-weight the costs, providing further support for these types of management schemes. The study concluded that while further research should explore other mechanisms that would allow fishers to leverage the non-extractive use value of reserves (e.g., tourism) or the non-use value (i.e., existence value of biodiversity) to sustainably finance their conservation efforts, a stop-gap measure to ensuring long-term monitoring costs are covered might include limited extractive use of resources in the MPAs.

Ding et al. analyzed the performance of a new catch allocation scheme based in a weighted multi-criteria method that includes a relative deprivation coefficient in 11 Chinese coastal regions. The study demonstrated that the performance of the new allocation method performs better than previously used methods based in single-criterion and multi-criteria with equal weights. The authors concluded that the application of this method will contribute to reduce conflicts in the future allocation of fishing opportunities.

The historical patterns and current status of IUU fishing in the coastal and marine waters of Bangladesh was analyzed by **Mozumder et al.** The study demonstrated that because of the lack of appropriate and robust governmental regulations and manpower, IUU fishing led to the collapse of important fisheries, biodiversity loss, and increased poverty among fishers. To revert this situation, the study recommended raising the living conditions of poor fishers by improving the management of artisanal and industrial fisheries, and by motivating and training stakeholders.

In this Research Topic, attention was also paid to the development of new techniques that allow increasing the sustainability of mariculture (**Loayza-Aguilar et al.**), and reducing its negative interactions with other coastal activities like fisheries and tourism (**Chor et al.**).

Loayza-Aguilar et al. explored the implementation of new Integrated Multi-Trophic Aquaculture (IMTA) initiatives in Peru. The study proposed and validated a IMTA model for the scallop *Argopecten purpuratus*, after an analysis of the local conditions and specific cultivation needs of the species. The authors concluded that the IMTA on this species will minimize the negative environmental impacts of the culture, while keeping its profitability.

Chor et al. assessed the reallocation of intensive aquaculture facilities in Malaysia to improve the decline in water quality, associated to increasing fish mortality, and decreasing profitability. The authors developed a feasibility analysis of current and potential locations that assessed the benthic communities, substrate and water quality, hydrodynamics, and climate. The authors concluded that reallocation to offshore, more hydrodynamic waters by using fish cages made with high-density polyethylene would increase sustainability of the system and increase revenues for local fish farmers.

Finally, the impacts of climate change on the interaction between kelp forests and SSF was explored in Piñeiro-Corbeira et al. Kelps conform key habitats in temperate regions that have experienced severe declines in the last decades. However, the consequences of their decline for SSF have received little attention. In the study, it was found that in Galicia many fish, echinoderms, crustaceans, mollusks, and kelp species are exploited, showing high socioeconomic value. The study concluded that in the last two decades there has been an important reduction of the area where kelp forests used to occur, which was associated with decreases in the fisheries typically developed in these habitats.

Author contributions

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