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REVIEW ARTICLE

An Insight into The Edge of The World Fisheries

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ABSTRACT
An well-structured study of futuristic world fisheries and aquaculture prospects have yet to be accomplished, reasonably the research on fisheries and relevant sectors focuses on local actions based on global policies & species-specific strategic issues. Prognostics of present trends resembles dramatic rise in the production and consumption of fish in last 3 decades. That enables the continuous increase in global appetite for fish causing serious impact on world's wild fisheries threatening the viability of the sector as well as well-being of poor people and the environment. Reviewing the current scenarios taking into account the major shifts taking place in the sector reflects that a whole ecosystem of new technologies that complement and communicate with each other will help in shaping the forward-looking policies that can facilitate better fish stock management, MPA implementation and fight against IUU fishing.
Keywords: *Overfishing, IUU, climate change, high sea, coral.*

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INTRODUCTION

The world's fisheries provide more than 3.2 billion people with at least 20% of their average annual per capita protein intake [1]. In recent years, capture fisheries management has attracted global attention from the international community and national governments, because fisheries resources are on a declining trend and the industry is plagued with economic and social problems [2]. Many fisheries are managed by total allowable catches (TAC) and a substantial part by individual quotas. According to SOFIA 2018, while the percentage of fish stocks at biologically unsustainable levels climbed from 10% in 1974 to 33.1 percent in 2015, the percentage of fish stocks at biologically sustainable levels unexpectedly declined from 90.0 percent in 1974 to 66.9 percent in 2015. It could taint scientific recommendations and raise the likelihood of a stock market crash in the near future. On the high seas, unsustainable fishing poses a serious danger to both fish stocks and biodiversity [11-14]. This threat is compounded by climate change [3]. Researchers have studied potential climate change impacts on the wild fisheries through different methods. Oceanic primary production is projected to decline by 6 percent by 2100 and by 11 percent in tropical zones. Different models predict that by 2050, the total global fish catch potential may vary by less than 10 percent. It may depend on the course of greenhouse gas emissions, but with very significant geographical variability. Global oceanic fish stocks have been responding to ecological changes as warming, acidification, deoxygenation and climate-mediated changes in primary production. For those stocks whose distribution straddles the high seas and countries' EEZs, changes in high seas governance under climate change will also impact the productivity of these fish stocks within EEZ boundaries [13]. These findings underline the importance of responding to climate change in a coordinated manner to the crucial engagement of advance technologies in meeting FAO's goal of a world without hunger and malnutrition.

DISCUSSION

Trending fisheries research is based on multispecies or ecosystem-based management linking the environment-species interaction. Decline of global fisheries resembles the degradation of habitat and upscaling of overfishing. Regional Fisheries Management Organizations (RFMO) are uniquely and strategically positioned to take a leading part in regional and global efforts in the fight against illegal,

unreported and unregulated (IUU) fishing and addressing overfishing. The consequences of current illicit practices would be dire and irreversible. IUU fishing frustrates the regulation and conservation efforts undermining the effectiveness of measures adopted nationally, regionally and internationally to secure and rebuild fish stocks for the future. It damages millions of people and has a harmful effect on local and worldwide fish populations as well as marine ecosystems. Fishing pressure has transferred to less explored stocks as specific stocks have been depleted. To meet the demand on a worldwide scale, industrial fishing fleets have also changed their methods to fish farther offshore and in deeper water [6]. Increasing fishing expansion on the high seas as a result of declining catches per unit effort in many EEZs are likely to contribute to the overexploited stock status of many high seas fisheries, including for some pelagic species such as tuna and sharks [7]. Pelagic fisheries on the high seas have also substantially contributed to the overexploitation of a number of targeted highly migratory stocks (Eg. tuna and billfishes) [8]. The threat to bentho-pelagic species from fisheries and other industries such as mining, gas and oil extraction is exacerbated by our limited understanding of the biogeography and basic life history of most deep-sea creatures [8]. It may prevent the accurate projections of future of deep-sea systems and physical or ecological feedbacks that will occur as well as the impacts from the different extraction sectors. Bottom trawl fisheries are not sustainable particularly for long lived species that are caught as bycatch (such as deep-sea corals), that produce few young (such as deep sea sharks) or that aggregate to feed or spawn (such as orange roughy) are vulnerable to overfishing. High fish biomass and low fish productivity creates an incentive for unsustainable fishing [9]. A major policy shift is required if the problem is going to be successfully addressed, such as wide scale manipulation of AIS tracking data including poaching that threatens species like highly endangered porpoises etc. The responsible use of automatic identification system (AIS) to track fishing activities can potentially improve compliance and reduce IUU fishing on the high seas [10]0. Illegal totoaba (*Totoaba macdonaldi*) fishing for maws is pushing the critically endangered vaquitas (*Phocoena sinus*) remain. [15]. The long-term survival and profitability of bigeye fisheries are, however, under jeopardy due to decades of overfishing, recent population decreases, and dangerous fishing methods. Yellowfin tuna in Indian Ocean and bigeye tuna in the Atlantic Ocean were both considered overfished, though both still show biomass above 0.5 BMSY and yellowfin shows biomass above 0.8 BMSY. The substantial shifts in wild sockeye salmon abundance & productivity in Alaska that often lasted for decades or centuries is now a major concern [16]. The top predators that are most economically viable (such as snapper, tuna, cod, and swordfish) are depleted by overfishing, and as a result, commercial fishers are forced to start taking species from lower trophic levels. The downward shift is global now with a concept like "*fishing down the food chain*". In some regions of the world, coastal ecosystems have collapsed as a result of overfishing and other types of environmental deterioration. Examples of these ecosystems include kelp forests, coral reefs, seagrass beds, and estuaries. These ecosystems provide complex habitats for a multitude of species and often are the foundation of many local fishing communities [4].Over much of the world, the biomass of fish targeted in fisheries (including that of both the target species and those caught incidentally) has been reduced by 90% relative to levels prior to the onset of industrial fishing, and the fish being harvested are increasingly coming from the less valuable lower trophic levels as populations of higher trophic level species are depleted. These pressures continue to grow in all the Millennium Environment Assessment scenarios. Some coral reef ecosystems have abruptly changed from being dominated by coral to being dominated by algae and the abrupt change in the dominance of coral over algae on Jamaican reef systems. This came after several centuries of overfishing herbivores, which left only one species of sea urchin—whose populations were decimated by a disease exclusive to that species—to manage the algae cover. As a result, Jamaica's reefs changed into a new condition with minimal biodiversity, a predominance of algae, and very little ability to support fisheries. In the high seas, whether or not under an RFMO's jurisdiction, IUU/FOC (Flag of convenience) vessels are not forbidden to fish under current maritime law. Thus, even where they undermine existing fisheries management arrangements, IUU/FOC vessels can hardly be punished for doing so, dramatically reducing the potential effectiveness of sanctions [18]. The global commons are being degraded as a result of the sluggish and haphazard implementation of treaties on global climate change, international fisheries, and trading in endangered species. The reduction of poverty, hunger, and malnutrition is one of its main goals, as is integrated management that leads to inclusive growth that supports the three pillars of sustainable development (social, economic, and environmental) [19]. Because of rising human population and shifting food tastes, there will be a greater risk of a significant and long-lasting collapse in regional marine fisheries. Demand for both freshwater and marine fish will rise.

CONCLUSION

The OECD study concluded that the first major step in combating such activities is to identify measures that render them unprofitable. This can be accomplished by using measures targeted at lowering IUU fishing revenue, raising IUU activity running costs, raising IUU vessel capital expenses, and raising the risk associated with IUU activity [12]. World Trade Organization (WTO) is working towards binding principles on fisheries subsidies that contribute to IUU fishing, overcapacity and overfishing [20, 21]. IUU fishing is primarily an economic activity. In addition to their effects on distribution, fisheries subsidies have an impact on resource management and sustainable use. Current scenario also implies development of alternative fisheries targeting jellyfish and other zooplankton (particularly krill) for direct human consumption and as feed for farmed fish resulting in elimination of fish from the markets of countries still "developing" in 2050 [14]. Technological and digital advances now allow innovative monitoring equipment to better manage fish stocks, which are used in all stages of the value chain. As new technologies, such as Big Data, the internet of things (IoT), sensors, robots, data storage, and transmission, are smaller and less expensive, more people will use them. The high expense of these technologies, the need for increasingly complicated data, the difficulty of sharing this data among fisheries management bodies, and the small pool of people with the necessary skills still prevent them from being used more widely.

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