Evaluating the effectiveness of eco-labeling schemes in promoting sustainable fishing practices

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Abstract

Fish are an important ecological component that aids in the distribution of marine production among terrestrial creatures. Phytoplankton contributes 45–50 Gt C year-1 to global net primary production, which is half of global net primary productivity. In contrast, 1.9 Gt C year-1 of net primary production is contributed by the world's coastal vegetation. Ocean life is sustained by this enormous productivity, which is distributed among higher order creatures through energy transfer and trophic interactions. Fish store a large amount of this energy, which humans then eat. Fish are so crucial to the cycling of nutrients and energy between aquatic and terrestrial ecosystems. To guarantee a sustainable marine fishery, it is crucial to comprehend the structure of marine ecosystems and the energy transfer at the trophic level. Initiatives to encourage sustainably managed fisheries and draw attention to their products are known as eco-labelling. The goal of eco-labelling product claims is to meet the public's increasing need for environmentally friendly goods. Life-cycle assessments are typically used by eco-labels to ascertain a product's environmental impact "from cradle to grave." The underlying premise of all eco-labelling programs is that consumers' purchase decisions are influenced by factors other than price and required quality and health criteria. Instead, customers' considerations of product features can be related to both economic and social goals as well as ecological and environmental goals.

Keywords: Ecosystem, Aquaculture, National marine fisheries service, Ecosystem-based fisheries management

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Introduction

The ocean contains around 96.5% of the earth's water, and water covers roughly 71% of the planet's surface. As aquatic creatures, fish are unquestionably the aquatic system's master. It is valued as a human resource in addition to having a significant impact on aquatic environments. There is strong evidence from the earliest images found on rock walls, which date back around 40,000 years, that fish met a variety of human needs, including both spiritual and physical (food). The demand for food rises as the human population grows (Peiró-Signes, Miret-Pastor and Segarra-Oña, 2020). The UN's DESA (2015) report estimates that by 2050, there will be 9.7 billion people on the planet, making it more difficult for the international community to ensure that everyone has access to enough food and nutrition. A healthy diet should have adequate amounts of proteins that contain all the required amino acids, as well as key fats, such as long-chain omega-3 fatty acids, vitamins, and minerals. Fish is rich in many minerals (calcium, iodine, zinc, iron, and selenium) and vitamins (D, A, and B). It offers all of the essential amino acids and high-quality, easily digestible protein. Fish is therefore essential for nutrition. Fish, the least expensive type of animal protein, is a staple in the diets of some densely populated countries (Karlsen, Hermansen and Dreyer, 2012). Fish makes up more than half of the total animal protein consumed in Bangladesh, Cambodia, Ghana, Indonesia, Sierra Leone, Sri Lanka, and certain small island developing republics. Furthermore, for 3.1 billion people, fish accounted for about 20% of their average daily intake of animal protein. The demand for fisheries products and patterns of food consumption are being greatly impacted by growing urbanization. By 2025, the average person will consume 21.8 kilograms of fish, which is 8% more than they already do. As demand grew, fishing methods also advanced and a number of inventions were created (Potts and Haward, 2007). Around 3500 BC (around 5500 BP), the majority of the main traditional fishing methods, including spear, net, line, and rod, developed simultaneously in Egyptian history (Gartside and Kirkegaard, 2009). Fishing was mostly done using traditional methods (artisanal fishing) until the middle of the previous century. Later, productivity in the marine capture fisheries industry rose significantly with the introduction of motorized boats, combustion engines, sophisticated methods for detecting fish schools, more efficient netting procedures, and efficient fish storage units. Mass capture and automated processing technologies resulted in overfishing and stress on this special aquatic resource at the same time (Ramachandran, 2010).

Fishing Structure of India

The Indian marine fisheries industry primarily operates three types of fishing vessels. These include motorized (smaller boats with outboard engines), mechanized (big boats with inboard engines), and traditional non-powered boats. In India, mechanized fishing vessels were first used in the late 1950s and gained popularity in the 1960s (CMFRI, 2005). Following that, there were 72,559 mechanized boats in 2010 compared to 6,708 in 1961 (CMFRI,

2010). Efficiency developed in tandem with the number of boats. The mean engine horsepower of mechanized boats rose from 55 horsepower in 1961 to 122 horsepower in 2010, resulting in a 2.2-fold increase in fishing efficiency over the 50-year period (Selden *et al.,* 2016). The popularity of small-scale fishing skyrocketed in the 1980s with the introduction of outboard engines, or motorized boats. According to the Marine Fisheries Census of India, the combined fishing fleet's fishing power has increased by over 27 times in the last 50 years (CMFRI, 2010). Despite their continuous use in the fishing industry, traditional non-motorized watercraft have decreased in quantity by 45% over the past 50 years.

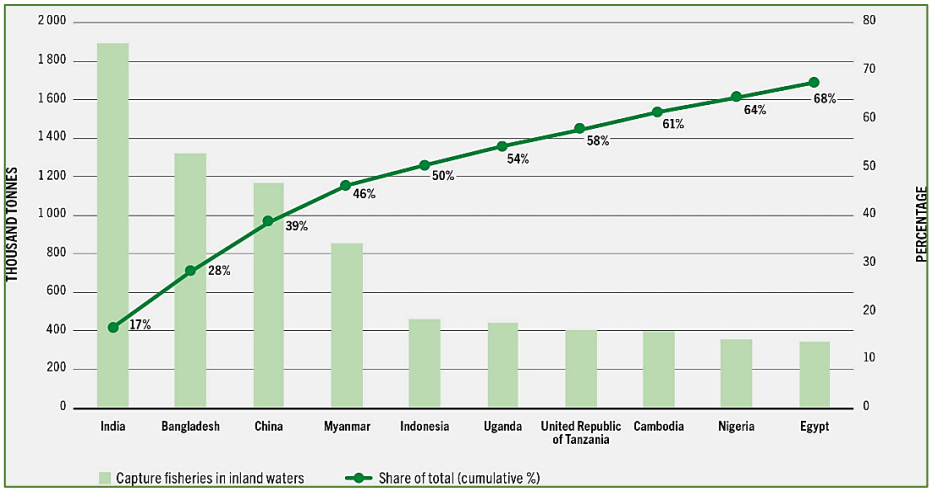

Figure 1: Fishing structure of India (source: web).

Figure 1 display fishing structure of India. Fish landings rose from 0.6 million tonnes in the 1950s to 3.6 million tonnes in 2016 due to improved boat efficiency, the expansion of fishing to offshore grounds, and improved seafaring endurance (CMFRI annual reports). This pattern of catches appears to be at odds with the global trend of landings stagnating at about 90 million tonnes since 1995 (FAO, 2010). Nevertheless, India's tendency of rising catches does not correspond with rising fishing efficiency. While fishing efficiency has increased almost 27 times over the past 50 years, catch has only increased six times.

Current and Proposed Eco-Labelling Initiatives for the Fisheries Sector

Eco-labelling might give the monetary motivators expected to better long haul the board and the accessibility of normal assets fundamental for the country's financial flourishing, as per various legislatures and industry groupings. By establishing eco-labelling frameworks, countries can fulfill their responsibilities under peaceful accords on significant natural objectives, like the manageable utilization of organic assortment and dependable fishing (Kirby, Visser and Hanich, 2014). Expanding buyer decision and acquiring government support for worked on natural administration and norms are, all things considered, the primary targets of eco-marking. Labelling is one of the most un-coercive market-based strategies to further develop protection results (Cooper, 2004). The confidential area is turning out to be more keen on eco-labelling fisheries items in both created and non-industrial nations because of the business

and commodity open doors eco-marking has given in various different areas. Furthermore, as referenced prior, the potential for eco-named items to build their piece of the pie goes with eco-marking an alluring business decision.

Assuming fisheries the board works on in light of endeavors to meet accreditation measures, the likely advantages for fisheries in both modern and non-industrial nations might offset the expected additions in profit that ecolabeled items might acquire (de Melo *et al.,* 2024). There are clear mutually beneficial arrangements in the field of fisheries the executives, despite the fact that it can be a challenging task in many locations. Some people believe that eco-labelling is crucial to getting into new, high-end green markets (such as market access). Adding value to current products, expanding market reach, or maintaining market share in a competitive climate are all made possible by eco-labelling for manufacturers who are willing and able to meet sustainability requirements. Some exporters may use product differentiation to increase their export revenue, and eco-labels may be one source of this distinction. The probability of capture for each species shows in figure 2.

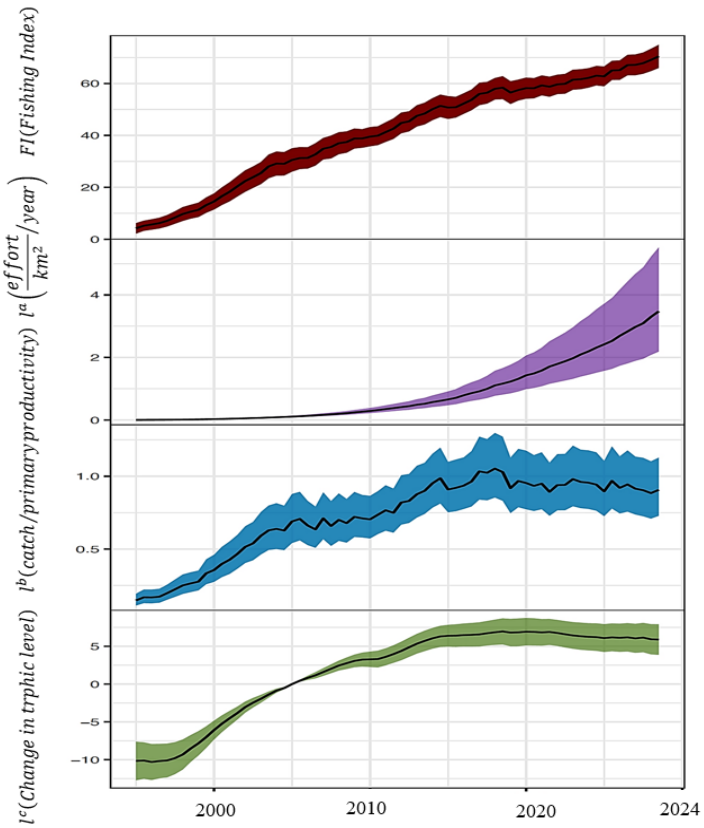

Figure 2: The probability of capture for each species.

Additionally, there is optimism that eco-labelling may open up new avenues for luring joint ventures and capital investment to developing nations. Some developing nations, for instance, want to increase their chances of satisfying the requirements for their fisheries' certification by collaborating with other nations in their area or forming joint ventures with fishing companies from industrialized nations. Additionally, eco-labelling can give creative producers a

chance to profit from the use of greener production techniques. Notwithstanding these advantages, a number of governments, manufacturers, and civil society organizations have voiced different worries regarding eco-labelling.

Conclusion

The international community should undoubtedly elaborate on and address a variety of eco-labelling-related concerns. To guarantee that their interests are heard, suitable solutions are developed, and the processes for creating eco-labelling standards and systems are transparent and further the ultimate objective of ecologically responsible fisheries, it is imperative that all governments, interested industry, and civil society organizations participate in these discussions. One method to make sure that the variety of fisheries and interests in developing nations are taken into account is to be involved in the creation of sustainability criteria and certification procedures.106 There is a chance to create a worldwide consensus on suitable certification through international initiatives to foster discussion about the potential structure and content of global eco-labelling rules. Countries may not necessarily support current or proposed eco-labelling programs just because they participate in or approve debates, such those organized by the FAO. By opting to participate in such discussions, governments, business, civil society, conservation, and fishworkers' organizations can guarantee that a comprehensive framework for present and future eco-labelling initiatives is in place that can be used to: a) pinpoint the specific issues of developing nations; b) advance a set of guidelines for eco-labelling programs that are advantageous for both promoting industry interests and advancing strong environmental goals.

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