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### **Fisheries Resource Management: Situational Analysis and Recommendations to Address Some of the Major Challenges in Malaysia**

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*The fisheries sector plays a significant role in supporting coastal communities' livelihood and the development of the national economy. It not only contributes to the national Gross Domestic Product but also to employment, foreign exchange earnings and as a source of protein. As such there is a critical need for its long-term sustainable utilisation and protection for the benefit of the people and nation. Also of importance is the need to utilise its resources to achieve economic growth, human resource development, capacity building within fisheries and mariculture branches, employment creation, and sound ecological balance. The demand for fish continues to increase, making the task of managing the fisheries resources on a sustainable basis, increasingly complex. The threats of over-exploitation and the decrease in recruitment due to degradation and destruction of aquatic habitats are major factors of concern. This article discusses some of the major issues and challenges involved and provides recommendations for sustainable fisheries management in Malaysia.*

#### **Introduction**

The fisheries sector is crucial in ensuring food security as well as a source of income for the nation. Overall, the marine capture fisheries sub-sector comprising inshore and deep-sea resources is the major contributor to the national fishery sector. Inshore fisheries contribute an

average of 60 percent in terms of quantity to the national food fish sector while deep-sea fisheries contribute about 15 percent to the national fish food sector.

Coastal habitats and ecosystems are among the major components to maintaining sustainable fisheries. Coral reefs, mangroves and seagrass beds for instance provide for practical restoration ecology to enable sustainable extraction of fishery resources from the coasts and seas. Actions have been taken to conserve and rehabilitate the country's coral reefs, including gazetted these areas as marine parks and fisheries protected area. Activities harmful and destructive to coral reefs and the marine ecosystems are prohibited under the Fisheries Act 1995. Additionally, the mangrove forest is an important ecosystem that plays a unique and vital role in the socioeconomic well being of the coastal communities. In addition to stabilising sediments and slowing water movements for instance, mangroves make up for critical habitats for the juvenile fishes, crustaceans and birds in general. Studies have shown that total prawn landings in Malaysia are positively related to the extent of mangrove coverage (Chong & Sasekumar, 1994; Loneragan et al., 2005). Threats to Malaysia mangroves emanate mainly from land conversion or deforestation for agriculture, industry and for aquaculture. Other significant coastal ecosystem components in Malaysia such as seagrasses are also threatened due to land conversion, sand mining, unsustainable marine aquaculture, reclamation, sedimentation, faecal contamination and heavy metal pollution. These aspects make up for some of the major challenges in ensuring sustainable fisheries.

### **Global fisheries status**

A wider picture on resource exploitation at the global level shows that major fisheries have been severely overfished over the last decade with many more stocks heading towards depletion albeit with varying degree of recovery among species. In general, if more fishes are caught than the amount of fish being added to the stock through reproduction, the size of the stock decreases, or may even collapse. Findings from research carried out on large predatory fishes by Myers and Worm (2003) show consistent and rapid increases recorded in the first 10 years of exploration followed by a steady decline thereafter. The research also suggests that more than 90 percent of large predatory fishes may have been lost from the oceans entirely, indicating that present fishery activities might be causing a further decline in mean trophic level of catches.

Further, the value of fisheries exports by developing countries has also significantly increased. Technical advancements in the fishery sector include electronic fish-finding equipments (e.g., remote sensing, sonar, and Global Positioning System), and the use of larger vessels, and wider and stronger nets. This has basically increased global fishing efficiency and capacity. Unfortunately, the steady exploitation by fishermen worldwide has turned to become over-exploitation. Data from the UN's Food and Agriculture Organisation (FAO) show that up to 80 percent of the world's primary catch species has been exploited beyond or close to their harvest capacity, and some productive seabeds have been partly or extensively damaged over large areas of fishing grounds. Bottom trawling carried out with highly destructive gears such as trawls, dredges, and traps is a particular concern in most fishing areas.

Fish biologists are concerned that it is not the direct global extinctions of species but the regional or local extinctions being more common, as abundance declines. Studies show little, if any, recovery 15 years after 45-99 percent reduction in biomass (Hutchings, 2001). There are further indications that marine extinctions may be significantly underrated. In addition, impacts brought about by large-scale, long-term fisheries exploitation have also been reported to cause permanent changes to the ecosystems with significant ecological and economic costs.

Unfortunately, scaling back commercial fisheries exploitation has been somewhat difficult mainly due to the overcapitalisation of fisheries as fishermen seek to recoup their investments.

### **The situation in Malaysia**

A similar dilemma faces the management of fishery resources in Malaysia. Resource studies by the Department of Fisheries Malaysia (DoFM) indicate that for most part, resources are heavily stressed and exploited beyond their Maximum Sustainable Yield (MSY). The last published resource assessment survey by the DoFM was in 1997. Recent data show that total landings have stabilised in the inshore areas of less than 30 nm from shore in west and east coasts of Peninsular Malaysia and in the inshore areas of less than 12 nm in the coast of Sarawak and west coast of Sabah. It is believed however that the yield has already reached its maximum. Further increases in production to meet projected local demand are now largely focused on offshore fishing and mariculture. Although this approach is feasible, maintaining production of the inshore areas is however also necessary in sustaining livelihoods of the fishery communities involved in the area. Sustainable exploitation of the fisheries resources in the inshore waters is therefore also important.

Of particular example include the study by Islam et al. (2011) investigating the productivity of marine fisheries based on specific fishing gears (trawl and purse seine fleets) used in the east and west coasts of Peninsular Malaysia from 1990-2005. It showed that the catch per unit effort (CPUE) was higher for purse seine on the east and west coasts of Peninsular Malaysia although general productivity has not increased over time with productivity of trawl fleets being generally low. The study recommends the need to restrict fishing effort through vessel limitation programmes as a means to raise productivity, in addition to enhancing stocks such as through the construction of artificial reefs.

A goal of fisheries management in Malaysia is to achieve sustainable coastal fisheries. Various strategies have been implemented to control the fishing effort and rehabilitate and conserve marine resources and ecosystems, and include:

- a. Direct limitation of fishing effort via licensing of the fishing gears and fishing vessels.
- b. Identification of nursery areas to be protected and managed as nursing area to ensure survival of the juveniles of commercially important fish species. These areas could be gazetted as closed fishing areas or areas zoned for specific fishing gear based on the tonnage of the fishing vessels.
- c. Facilitation of co-operative research efforts between government and academicians to provide data essential for the formulation of area management plans.
- d. Strict enforcement of regulations that address the problem of illegal fishing.
- e. Rehabilitation of resources through the establishment of artificial reefs and coral replanting programs.
- f. Conservation of turtles and biodiversity of the marine ecosystems.

### **Major challenges faced**

Coastal resources are being largely exploited by both traditional and commercial gears. Despite the increase in total landings, CPUE data on show declines in both pelagic and demersal fisheries resource indicating overexploitation. Resource studies further indicate that, for the most part, fisheries resources are heavily stressed and being exploited beyond their MSY with

increasing share of trash fish recorded in fish landing compositions as an indication of over-exploitation. Some of the major challenges associated with fisheries resource management include:

- 1) Occurrence of over-fishing where catches exceeds the level considered desirable for achieving sustainable exploitation of fish resources.
- 2) Occurrence of over-capacity where harvesting capacity of the fishing fleet exceeds the amount of resource available for harvest in the area. Improved in fishing skills and used of new fishing technology in fishing is a major cause in the occurrence of over-capacity.
- 3) The use of non-selective fishing gear such as trawl in the commercial sector and push net in the traditional sector harvesting fish before attaining maturity stage.
- 4) Illegal fishing technique such as push net used to exploit fish and prawn at juvenile stage, causes the loss in yield.
- 5) Traditional fisheries management regimes tend to focus on controlling fishing effort through access limitation to sustain stock levels. The complexity of the marine environment however precludes such one-dimensional management approach.
- 6) Current policy framework on fisheries management stipulates output-oriented goals, emphasising more on landings rather than quality.
- 7) Present institutional structure governing fisheries management and conservation in Malaysia involves fragmented approach among several agencies and divided between two ministries i.e., the Ministry of Agriculture and Agro-based Industries (MoA) and the Ministry of Natural Resources and Environment (NRE). Although the DoFM is the focal agency with regards to the fisheries sector, their mandate however is confined to fish in riverine, marine and estuarine waters; without jurisdiction to cover the management of fisheries ecosystems and habitats.
- 8) While marine parks and fisheries protected areas have been established, the dichotomy in jurisdiction between the federal government and the state governments is another challenge; with the latter being in charge of land matters and the federal government accountable to the marine park waters. The dual jurisdiction causes the danger of coral ecosystems destruction, often associated with unsustainable land development on the island adjacent to the marine park.

### **Recommendations to address these challenges**

- a) Provide better information on the status of the fish stock, with the pressing need for the more recent stocks assessment studies to be published. Furthermore, studies on design of fishing gear, vessels, and on appropriate engine-to-vessel size are also required.
- b) Need to assess the effectiveness of the various fisheries management interventions e.g., the buy-back-scheme, awareness raising on the dwindling resources among the stakeholders, strict enforcement on illegal fishing and fishing practices, introduction of subsidies, and the promotion of more selective trawl gears i.e., cod-end mesh size of 38 mm for trawls.

- c) The need to rehabilitate demersal fish resources by imposing controls on the collection of fish fry, banning sand mining, and declaring more islands and surrounding areas as marine parks or marine protected areas.
- d) The need to effectively implement the ecosystem based fisheries management (EAFM) concept into national fisheries management strategies. This would also be in line with the nation's commitment under Goal 2 of the Coral Triangle Initiative (CTI) programme.
- e) The need for technology transfer focusing on sustainable and environmental friendly aquaculture activities to reduce pressure on wild stocks to achieve effective fisheries management and food security.

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