

Juvenile Fishing an Emerging Global Problem: Conservation and Management for Juvenile Fishing

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Introduction

India is the second-largest aquaculture and third-largest fish-producing nation in the world. The blue revolution in India demonstrated the importance of the fisheries and aquaculture sector. The sector is considered a sunrise sector and is poised to play a significant role in the Indian economy in the near future. In the past, Indian fisheries have witnessed a paradigm shift from marine fish production to inland fish production, with the latter emerging as a major contributor to fish production from 36 percent in the mid-1980 to 70 percent in the recent past. A shift from capture to culture-based fisheries within inland fisheries has paved the way for a sustainable blue economy.

Between birth and adulthood, fish go through several stages of development. Juvenile fish develop from spawned eggs that hatch into immotile larvae. These larval hatchlings cannot yet feed themselves, but they do have a yolk sac that stores nutrition. Before the yolk sac completely disappears, the tiny fish must mature enough to be self-sufficient. The fish are called fry when they have developed to the point where they can feed themselves. When they have developed scales and working fins, they have completed the transition to a juvenile fish and are known as fingerlings, so named because they are typically the size of human fingers. The juvenile stage occurs until the fish reaches sexual maturity.

What is juvenile fisheries?

Juvenile fisheries occur when the fishery targets fishes of a size below the optimal harvestable size or undersized fishes or in the juvenile stage of fish.

Juvenile fisheries scenario

The global marine fish catch has registered a declining trend since the 1980s, owing to the collapse of many important fisheries worldwide. Overfishing is identified as the major contributor to observed collapses, mainly to technological advancements among the fishers' community to increase fishing efficiency. In open access marine water, the non-targeted catches in the form of the juvenile are detrimental, as this must reduce future yield and subsequent recruitment to the fishery sector. The proliferating effect of juvenile fishing is much more higher in a multi-gear and multi-species fishery where Intra and inter-sectoral conflicts exist. Growth overfishing occurred when the fishery targets fishes of a size below the optimal harvestable size. So sustainable fisheries management generally requires fishing gears that retain large fish while allowing juveniles to escape. The proportion of undersized fishes in the total catch is always high in a multispecies fishery gear where various kinds of gear and crafts are competitively employed to target different varieties of fishes. The recent shift in the employed fishing methods in inshore fishing has led to a remarkable increase in fish production on resulted of bycatch and juvenile catch. However, this will have negative impacts, ultimately reducing the fish caught in the long run. There are various reasons for the



unawareness among the fishers regarding this concept.

Fig. 1 Some pictures of Juvenile fishing

When the fishes are removed before the cohort has had the opportunity to achieve its maximum biomass level, the fishery will lose much of the potential yield that could be achieved by catching them in the near future. Many of the non-targeted catches and juveniles caught in many developed countries are discarded in the sea. In contrast, non-targeted catches

and undersized fishes are also brought to the shore in developing countries. The ratio of undersized fishes to the total catch is huge in a multi-species fishery where various gears are competitively employed to target different varieties of fishes. Disproportionately large-scale removal and destruction of young and juveniles of fishes and crustaceans are especially detrimental to the fishery. When juvenile mortality increases, future catches and subsequent recruitment will be affected.

Juvenile fisheries in India

Indian marine fisheries are typical multi-species multi-gear fisheries characterized by a heterogeneous fishery management system, formal and countless informal agreements and conflict management systems in practice in the different maritime states of the country. This is attributed to the role of state governments in formulating fishery policies rather than enforcing a uniform central fishery policy. The country's marine fisheries have long been an important source of occupation and livelihood for the coastal communities. Many people derive their livelihood from marine capture fisheries residing in fishing villages along the Indian coastline. However, concerted efforts to develop Indian fisheries began only after the Independence of India.

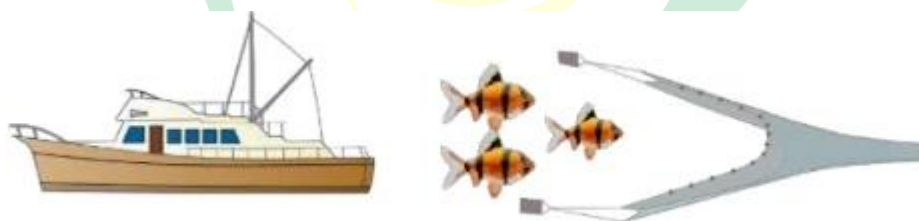


Fig.2 Fishing gears

India's mechanised sector's annual marine fish landings have a significant share from the mechanised sector, followed by the motorised sector. The implicit sectoral conflict in the harvesting pattern of multi-species multi-gear marine fisheries of the country is further affected by externalities like excessive fishing pressure, increased juvenile fishing, the inflow of pollutants, shallow water industrial activities, etc., all of which challenge the very sustainability of fishing resources and livelihood security of the vast majority of fisherfolk. While the recent changes in the fishing methods used in coastal fisheries of the country have

led to a remarkable increase in fish production, the problem of by-catch and targeted juvenile fishing is ever increasing. With an increasing population and an increasing number of fishers, the effort exerted to catch more fish is also increasing. Furthermore, the bulk of fish catches comes from coastal capture fisheries.

In India, there are tropical multi-species fisheries characterized by a heterogeneous fishery management system, formal and countless informal agreements, and conflicts management systems that are in practice in the different maritime states of the country. The fishing fleet of India has witnessed juvenile fishing from different gears. However, there is a lack of data on juvenile catch, especially from gillnet fisheries, and there is an inconsistency in the available data. Gillnetting has become popular among fishers being less capital intensive, selectively operated depending on availability and demand, and can be operated in areas where the bottom is not suitable for trawling. Though gillnets are found to be a very selective fishing gear, the usage by considerably reducing the mesh size makes it a non-selective gear. This conversion resulted in the increased landings of juveniles in the gear catches. However, fishers would be reluctant to hear and understand the ecological impacts.

Suggestion to stop juvenile fisheries

There are a few suggestions to stop juvenile fisheries:

- The government should organize awareness programs at important fishing centers to educate the fishers about the importance of resource conservation and the methods suitable for this purpose.
- The government should enact and enforce appropriate legislation for the organised fishing sector.
- Implementation could be monitored with the help of organizations like the coast guard. Government organizations like the Central Institute of Fisheries Technology should be entrusted with licensing the design of fishing gear used by commercial vessels to curtail the use of totally destructive gears.

Conclusion

Conservation and management measures for the sustainable exploitation of marine resources are attracting worldwide attention due to the poor conditions prevailing in many commercially important fisheries. Appropriate governmental regulations will make positive changes in many parts of the world, and introduction and enforcement wherever possible are



in the best interests of conservation and management of marine fishery resources are essential to avoid juvenile fishing.

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