THE SEVENTH INDIAN FISHERIES FORUM

8-12th November, 2005, Bangalore India

Organized by

ASIAN FISHERIES SOCIETY, INDIAN BRANCH, MANGALORE
INDIAN COUNCIL OF AGRICULTURAL RESEARCH, NEW DELHI
KARNATAKA VETERINARY, ANIMAL AND FISHERIES SCIENCES UNIVERSITY, BIDAR
UNIVERSITY OF AGRICULTURAL SCIENCES, BANGALORE
FORUM OF FISHERIES TECHNOLOGISTS, BANGALORE

SOUVENIR

Editorial Committee
D. Seenappa,
C. Vasudevappa
S. Ayyappan
Y. Basavaraju

VENUE:
HEBBAL CAMPUS
KARNATAKA VETERINARY, ANIMAL AND FISHERIES SCIENCES UNIVERSITY, BIDAR
BANGALORE – 5600 24, INDIA

INDIAN MARINE FISHERIES - THE ROAD AHEAD*

Mohan Joseph Modayil
Director
Central Marine Fisheries Research Institute, Cochin

Globally, fish has been attracting increased attention not only as an item of connoisseur's delight and preferred food for health conscious elite, but also as a centre-stage of US$ 100 billion industry and a source of employment, livelihood and food security to several millions of poor people in the developing world especially in the Asian region which contributes 63.17 % (2003) of global fish production. Fish contributes 15 to 54 % of animal protein intake in Asian countries

The marine fishery in India has a long history. Although evolved as livelihood activities along the coastal habitats over hundreds of years, has made rapid changes since the advent of mechanization in early 1950s, transferring itself to the present status of an industrialized multi-million rupees worth industry. From an initial small-scale artisanal activity with hand made craft, gear and simple tackle, the advent of mechanization and subsequent modernization in capture, handling, processing and by-product development transformed marine fisheries in to a diversified commercial activity with many ancillary industries dependent directly or indirectly on fish. Marine fisheries in India which is essentially open access capture of a natural resource, contributes to about 50 % of total fish production in the country in recent years and the total marine fish landings were fluctuating around 2.7 mmt. During 2004 the annual marine fish landings were to the tune of 2,538105 tones and the export value of marine products from India has been around INR 6500 crores annually. Essentially, the marine capture fisheries have been depending on inshore fisheries, which has been showing signs of decline and leading to conflicts between resource users. While there has been ever increasing demand for fish in the domestic and export markets, the areas of oceanic fishing, deep sea fishing, coastal mariculture and open sea farming of fish remain mostly unutilized.

The marine fisheries being a tropical multi species biodiversity rich resource, its major components are pelagic fin-fishes, demersal fin fishes, crustaceans, molluscs and ancillary fisheries components. The general picture that emerges indicates that the mechanized sector plays an important role in the fishery contributing to about 66%, the motorized sector 27% and the artisanal sector 7%. The overall pelagic fin-fishes constituted 56% of the total marine landings, the demersal fishes 22%, crustaceans 17% and molluscs 5%. Analysis of the marine fisheries scenario indicates that 40% of resources are either in mature or senescent stages. Therefore, there is little likelihood of increased landings from these resources. The remaining resources that are in the developing phase could contribute to increased landings before ultimately reaching the asymptote. It has been predicted that the Indian marine fishery has a long-term potential yield of 2.72 million tones while the average annual potential would be around 2.58 million tones. The CMFRI is in the process of developing predictive models for various major fisheries and also the management game tool for planners and policy makers for understanding implications of management decisions.

* The views expressed here are of the author and may not reflect those of the organization represented.

Although the marine fisheries had an average growth rate of 6.4 % during the past four decades, since 1989 the fish yield had reached a plateau. The growth rate has been on the decline, the average for the period 1991- 2000 being only 1.9 %, between 2002-03 it was 0.1 % and 2003-04 1.9 %. The negative growth rates, which have emerged, now are causing grave concern to fisheries managers.

Much of the fishing effort is concentrated on the shelf fall within the 2-200 m depth zone. In general, the marine fish production figures depend on the success or failure of major pelagic resources such as oil sardine, mackerel, Bombay duck and shrimps. While it is well known that most pelagic fisheries can suffer wide fluctuations and recoveries, the reasons are attributed to factors such as spawning success and failures, recruitment strengths, accessibility, vulnerability and environmental factors. In contrast to this scenario, there is a highly targeted shrimp fishery, particularly for the penaeid shrimps, the landings of which have been fluctuating with out any definite trend. The Catch per effort for shrimps and mean size caught further indicate that the fishery is exploited to the maximum with no scope for increased efforts to obtain higher yields. Analysis of the sectoral trend indicates that the mechanized sector accounted for 67.9 %, motorized 25.0 % and artisanal 7.1 % of yield. The artisanal sector has lost its significance in the production sector and is being increasingly marginalized. While there is little scope for increasing fishing pressures in the coastal areas up to 80 m depth zone, there are a few deep-sea resources, which are presently under-exploited. The inshore waters are under heavy or exhaustive fishing pressures. Most of the resources are optimally exploited and a few are marginally over-exploited. The coastal fishery has a high level of over capacity in terms of fishing effort. The general picture, which emerges from recent analysis show that the marine fisheries in India are at a crisis now. Another major setback to the fishery is the indiscriminate exploitation of juveniles of many species of commercially important fishes as a result of illegal fine meshed gears. Large quantities of juveniles thus caught are diverted to the animal feed industry. The rapid development of the aquaculture sector and the ever-increasing demand for the fishmeal in the animal feed industry are causing concern to resource managers. On the one hand there is biodiversity loss and loss of potential adults which will result in stock depletion while on the other, there is reduced replenishment level of major fish species and sectoral loss by diverting animal protein from the human food sector to animal feed. It is regarded as a typical example for irresponsible abuse of fishery resources, indeed.

An alarming concern is the unregulated growth of the motorized sector in the coastal fisheries. The total marine landings which showed an increase from 1.8 lakh tons in 1986 to 7.0 lakh tons in 1997 and 6.19 lakh tones during 2004. The motorized sector has increased from 0.94 million unit operations in 1986 to 6.0 million unit operations in 2003. On the other hand, the amount of time expended for actual fishing by the mechanized sector doubled during the past 15 years from 17.4 million fishing hours in 1986 to 35 million fishing hours in 2003 mostly due to multi-day fishing activities. In the motorized sector, the fishing hours increased from 3.3 million hours in 1986 to 25 million fishing hours in 2003. All these indicate the stressed resource environment in the capture sector, calling for informed intervention in regulation of fishing effort.

There are also many other threats to marine capture fisheries. The development of aquaculture itself is regarded as one such which affect habitat loss that is vital for breeding and nursery phase, high organic pollution of water bodies, coastal habitat conversion and loss of biodiversity. Threat to genetic integrity of wild stock through the breeding of escaped farmed fish as well as disturbing changes in the habitat and trophic relationship are also fall-outs of aquaculture. Increasing demand for wild seed and brood stock will exert further pressure on the marine capture fisheries. The ever increasing demand for fish meal and fish oils for the aquaculture industry will also put additional pressure on the wild marine species, especially the low value species and juveniles. Thus growth of aquaculture is an indirect threat to marine capture fisheries and will have a negative impact on it, contrary to the general belief that aquaculture will reduce the pressure on capture fisheries.

Another area of concern is the damage to the benthic fauna by continuous sweeping of the sea floor by the shrimp trawlers. This has a serious negative impact on marine ecosystems. A disturbed sea bottom takes over 2 years to go back to the original stage if kept undisturbed. But this does not happen. The sea floor is being continuously swept over and over by the same trawlers, thus damaging the entire benthic ecosystem. The decrease in area available in the sea per active fisherman and boat for conducting fishing operations is also a social concern leading to conflicts among the user groups. In recent years several instances of conflicts between artisanal, motorized and mechanized groups of fishermen, artisanal fishing and coastal aquaculture operators are being witnessed.

The world over, by-catches and discards at sea are causing concern to fisheries resource managers. While it is agreed that discards do not happen at landing sites where every variety of fish irrespective of species, size and quality has some use and value, discards do take place at sea on board. Discards at sea are substantial in commercial trawlers operating on a multi-day fishing mode. There have also been instances of giving away the discards to small trawlers in sea, causing conflicts at landing sites. The country is yet to fully understand the issue of discards at sea and evolve measures for reduction of it.

It has been now well recognized that the basic requirement for knowledge based fisheries management is availability of reliable and adequate data on the resources and their dynamics. For this, an effective data acquisition mechanism is needed. The maritime states must develop mechanisms to generate reliable data on marine fish landings and fishing effort, which could be used for understanding dynamics of the fisheries as well as for regulating their exploitation.

Another important lacuna is the dearth of recent data on the marine fishermen population, craft, gear and other demographic parameters. The fisheries census is long over due. Realizing the need for this, CMFRI has commenced a national frame survey with the funding support from the Ministry of Agriculture, Government of India and is expected to be completed by December, 2005.

Stock assessment is another area of importance. There is need to improve the capabilities for stock assessment of exploited stocks. A number of strategies are needed to ensure sustainability in the marine fisheries of the country. The inshore waters are currently exploited to optimum

and above optimum levels, which calls for reduction in the fishing capacity, which has to be done on a staggered basis. Any addition of fishing effort in the inshore waters would be disastrous to the resources. Also, fleet size for each stock as well as to the total stocks will have to be meticulously determined.

New strategies are to be evolved for utilization of the deep sea and oceanic resources. As a part of the national marine fishing policy, the Government of India has fixed the upper limits of the number of permitted deep-sea fishing vessels for effective exploitation of the resources. Also, measures are to be designed for rational exploitation of non-conventional resources. Equitable distribution of resources between various players is also an issue that needs attention in order to reduce social conflicts and economic inequity. Biodiversity conservation in the coastal waters must find immediate attention. Sea-ranching and artificial reefs are attempts in the direction of stock replenishment and conservation. Fish Aggregate Devises to a limited extent could be useful in helping the artisanal fisheries.

All these point towards the need for a knowledge based holistic approach for the management of Indian marine fisheries. It is well known that marine fisheries management is a continuous process and therefore data generation must continue indefinitely as long as fishery exists. Data acquisition, monitoring, analysis and policy advisories should never stop. The government must be able to derive policies out of the scientific strength available with the national fisheries research institutes.

Ensuring sustainability is of prime concern in marine fisheries management. There is a need to develop appropriate indicators of sustainability. Stock size, exploitation rate and replenishment rate, potential yields of species/groups, species ratios, by catches, discards, juveniles, economic indices (FDI), social development indices (SDI), trade and market indices etc could serve as indicators. Unless these are developed and quantified, it would be incorrect to relate sustainability to issues in marine fisheries.

A road map for ensuring sustainability, equitability, ecosystem conservation, eliminating destructive gears, reducing by-catch and discards and juvenile destruction, diversification of fishing into new areas, ensuring conservation of endangered and threatened species groups, putting into practice the FAO Code of Conduct for Responsible Fisheries, evolving working model for an informed participatory management of marine fisheries resources of the country is the needs of the hour. Since the coastal fisheries are in the domain of the maritime states, there is an urgent need to sensitize the States on the importance of putting in place an agenda for fisheries regulations as proposed by the Government of India. The stakeholders including fishers, scientists, policy developers and implementers working together can achieve this. The challenges ahead in meeting the increasing demand for seafood are formidable considering the non- availability of an environment fostering fast growth, over capacity of fishing efforts, lack of any management of the natural resource, declining factor productivity and an overstressed exploited fishery resource base. Regulated fishing, diversification, reduction in by-catch and juveniles, reducing post-harvest losses, value addition, promotion of coastal and open sea mariculture through private investments, higher fishery R & D investments and strategies to

make grey areas green are all options to be considered in making the 'Blue Revolution' possible in India.

The average annual per capita fish availability in the country is only 4.1 kg as against 8.5 kg in Bangladesh and 15.8 kg in Sri lanka. The projected per capita requirement of fish by year 2015 would be between 6.3kg and 7.9 kg and year 2030 between 6.9 and 9.2 kg. This means that the country's fish need could be of 5,514000 to 7,637000 tones in 2015 and 9,428000 to 12,611000 tones in year 2030. In other words, the fish production needs to be increased between 121 to 195 % by year 2030 to reach these targets. This is an onerous task and could be achieved only with a clear and multidimensional strategy addressing various issues in production, conservation, equity, management, value addition and technological interventions. Of these, in marine capture fisheries, informed fisheries governance is the key for achieving this objective. The recent initiatives from the Government of India in putting in to place informed fisheries governance will certainly set the process in motion and hopefully result in the anticipated outputs and outcome in good time.

❁ ❁ ❁