

Constraints encountered by fishermen due to fishing ban and their awareness status towards fishing ban and sustainability

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ABSTRACT

The marine fish production in India increased from 14.30 lakh tonnes in 1985 to 38.30 lakh tonnes in 2011. As fisheries is one of the important sector in India, it provides employment to millions of people and contributes to food security of the country. It is widely quoted that the depletion is due to introduction of trawler fishing techniques, which scrape the bottom of the sea and end up catching juvenile fish. In this context, State Government has imposed fishing ban for a specific period in order to allow the fish to spawn and replenish its species. Blanket ban on fishing during specific period in a year is one of the most commonly practiced techniques to sustain the fisheries resources. Therefore one should think about the sustainability rather than the increasing the production and we should ensure the fishermen aware of the fishing ban and its importance in sustainability. This study is conducted based on the above context to find out the constraints faced by the fishermen during the fishing ban period and their awareness status towards different aspects related to fishing ban and sustainability of marine resources. A group of 90 fishermen were selected from Thoothukudi north and Thoothukudi south using random sampling technique.

Key words: fishermen, fishing ban, awareness and constraints.

INTRODUCTION

According to the CMFRI Census 2010, there are 3,288 marine fishing villages and 1,511 marine fish landing centres in 9 maritime states and 2 union territories. The total marine fisherfolk population was about 4 million comprising in 864,550 families. Nearly 61% of the fishermen families were under BPL category. The average family size was 4.63 and the overall sex ratio was 928 females per 1000 males. Almost 58% of the fisherfolk were educated with different levels of education. About 38% marine fisherfolk were engaged in active fishing with 85% of them having full time engagement. About 63.6% of the fisherfolk were engaged in fishing and allied activities. Nearly 57% of the fisherfolk engaged in fish seed collection were females and 43% were males. Fishing is a major, natural renewable and open access resource industry of the country and the marine fish production in India increased from 14.30 lakh tonnes in 1985 to 38.30 lakh tonnes in 2011 [1]. This industry, apart from providing cheap protein food to the population, generating economy in 3651 fishing villages all along the 8129 km coastline of India. Above all fisheries generates 5.4 million tonnes of valuable animal protein and feed about 200 million people every year, meeting the basic human needs such as nutrition, food security and sustainable livelihood [2].

Indian marine fishery resources include an exclusive economic zone (EEZ) of 2.02 million sq.km and a coastal length of 6,068 km. There are 3,288 marine fishing villages and 1,511 marine fish landing centres among nine maritime states and the two union territories of Puducherry and Daman & Diu. The revalidated marine fishery resources potential of 3.934 MT is being harvested by a fleet size of 1,94,490 crafts comprising 72,559 (37.3 per cent), mechanized crafts, 71,313 (36.7 per cent) motorized crafts and 50,618 (26 per cent) non-mechanized crafts. [3].

The definition sustainable development given by the World Commission on Environment and Development [4] is taken as the guide line for the sustainable development now. "Sustainable development is that Development that meets the need of the present generation without compromising the ability of future generations to meet their own needs" This definition of sustainable development is widely accepted and commonly used world-wide.

In the extensive discussion and use of the concept since then [5,6,7], there has been a growing recognition of three essential aspects of sustainable development:

1. **Economic dimension:** An economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and external debt, and to avoid extreme sectoral imbalances, which damage agricultural or industrial production
2. **Environmental Dimension:** An environmentally sustainable system must maintain a strong and stable resource base, avoiding over exploitation of renewable resource systems or environmental sink functions and depleting non-renewable resources only to the extent that the investment is made in adequate substitute. This includes maintenance of biodiversity, atmospheric stability and other ecosystem functions not ordinarily grouped as economic resources.
3. **Social dimension:** A socially sustainable system must achieve distributional equity, adequate provision of social services including health and education, gender equity and political accountability and participation.

Among the various measures for sustainable marine fisheries development identified by the FAO, the following could be considered as important measures which are to be adopted by the stakeholders, especially for Indian waters. It is important to limit the exploitation rate of fish stocks, so that, sufficient fish survive to reach maturity when they are able to spawn produce the next generation. This can be done in two ways: firstly controlling of overfishing by reducing the fishing effort and secondly by technical measures such as proper selection of gear and mesh size for target species, avoidance of sea bed disturbance/ bottom scrapping, dynamite fishing, capturing of juveniles, capturing of brood stocks, fishing in closed fishing season, fishing in banned area and coral mining, etc. Besides, marine pollution control, use of electronic equipment in fishing and fish aggregating devices, introduction of sea ranching programme are also to be considered as important measures for sustainable use of fishery resources. It is widely quoted that the depletion is due to introduction of trawler fishing techniques, which scrape the bottom of the sea and end up catching juvenile fish.

MATERIALS AND METHEDS

Thoothukudi district is situated in the southern part of Tamilnadu and it covers an area of 4175 square km. It has a coast length of 163.50 kilometres accounting for 15.20% of the total coast line of the state. This district is surrounded by Virudhunagar and Ramanathapuram districts on the north, the Gulf of Mannar on the east and Tirunelveli district on the west. According to 2011 census, Thoothukkudi had population of 1,750,176 of which male and female were 865,021 and 885,155 respectively [8]. The district has a total of 21 coastal villages. The total fishermen population of this district was 69,558 among them, the male population was 35,828 and female population was 33,730 [9]. An open ended interview schedule was used to find out the various threats to sustainability of marine fisheries resources of Thoothukudi coast. A total of 90 respondents were selected from two fishing villages namely Thootukudi north and Thoothukudi south (45 from each village). The findings of this study revealed that 34.67 per cent of the respondents were not aware of the biodiversity and majority (82.71%) of the respondents were aware of conservation and remaining results were given in detailed in this paper.

RESULTS AND DISCUSSION

Personal attributes of the fishermen

The socio-personal attributes of fishermen were studied using a structural interview schedule and the major findings are reported in table 1. The results indicated that majority of the fishermen (63.30%) were belongs to middle age, followed by young (30%) and old (6.70%). When comes to educational status, majority of the fishermen had primary level of education (38.88%) followed by functionally literate (33.34%), middle level of education (24.44%),

illiterates (2.22%), secondary education (1.12%) and there are no graduates. As far as fishing experience is concerned majority of the respondents (66.67%) had up to 10 years of fishing experience, followed by above 15 years of fishing experience (27.77%) and very few (5.56%) had experience in between 10-15 years of fishing experience. This observation is in line with the conclusion of [10,11,12]Kiron,; Sujathkumar; and Arul oli,

Awareness status of the fishermen towards different aspects related to fishing ban and sustainability

As shown the major results in table No. 1, awareness on biodiversity is concerned, just above half (53.56%) of the respondents were aware of biodiversity, followed by not aware (34.67%) and well aware (11.77%). In case of awareness on conservation, majority of the fishermen were aware (56.17%) followed by well aware (26.54%) and not aware (17.29%). The study also revealed that all the respondents (100%) were well aware of the fishing ban period in Thoothukudi district. In case of awareness towards the restricted fishing gears and/or methods, majority of the fishermen (56.67%) were aware that purse seine is one of the restricted fishing gear and about 43.33 per cent of the respondents were aware that bottom trawl net is a restricted gear. Finally none of them were aware that destructive fishing is a restricted method of fishing.

Table. 1. Awareness status of the fishermen

Sl.No	Issue	Well aware	Aware	Not aware
Awareness on biodiversity				
1.	Terminology	23.33	60	16.67
2.	Understanding	5.55	57.77	36.68
3.	Importance on biodiversity	11.11	68.89	20
4.	Concern for declining biodiversity	8.88	20	71.12
5.	Communication about biodiversity	10	61.11	28.89
	Mean percentage	11.77	53.56	34.67
Awareness on conservation				
1.	Proper gear selection for targeted species	51.11	32.22	16.67
2.	Proper mesh size of the gear for aimed species	38.88	47.77	13.35
3.	Avoidance of sea bed disturbance/ bottom scrapping	8.88	68.88	22.24
4.	Avoidance of capturing juveniles	11.11	65.55	23.34
5.	Avoidance of capturing brood stocks	14.44	60	25.56
6.	Avoidance of sea going in closed fishing season	80	20	0
7.	Avoidance of fishing on banned area	20	60	20
8.	Introduction of sea ranching programme	5.55	82.22	12.23
9.	Marine pollution control	8.88	68.88	22.24
	Mean percentage	26.54	56.17	17.29

Constraints experienced by fishing communities due to fishing ban

The fishermen were interviewed and their responses towards constraints regarding the fishing ban were collected. The results are presented in Table 2.

Table 2. Constraints of fishing communities due to fishing ban

Sl. No.	Constrains	No.	percentage
Constrains in fisheries			
1.	Loss of Income	87	96.67
2.	Lack of employment	80	88.88
3.	Lack of alternative income generation other than fishing	85	94.44
4.	Lack of credit during ban period	65	72.22
Other constrains			
5	Inadequate subsidies on gears, crafts, engines and repairing works	80	88.88
6	Improper running of fishermen cooperatives	58	64.44
7	Problems on capital investment	55	61.11
8	Problems of debts	44	48.89

It could be seen from Table No.2 that most of the respondents (96.67 %) reported that they were not getting income during the days of ban period. One of the main reasons was that most of the fishermen depend only upon fishing for their livelihood. Eline van Haastrecht and MarjankaSchaap[13] concluded that the fishermen would consequently lose out their regular income normally made during these months because of the fishing ban. Hence, government should provide some relief amount during this ban period.

Lack of employment was another important constraint expressed by 88.88% of the respondents. Bavincket *al.*[14] reported that during closed fishing season there would be lack of alternative employment opportunities for lower class workers and traders. Hence, government should provide training on alternative employment opportunities like open sea floating cage culture, preparation of value added products etc. During off season the fishing activities were comparatively less in coastal villages and the fisherfolk were finding it difficult to run the family. They were also

not involved in any self-employment ventures. Thus, there was lack of alternative income generating employment activities during off season. Venkataramanujamet al. [15] also reported similar findings.

About three-fourths (72.22%) of the respondents reported lack of credit during the ban period as one of the main constraints. Generally the Government is providing a relief amount of Rs.200/- per day, but sometimes it is not implemented properly and hence fishermen are lacking in getting credit during ban period.

Suitable model for conservation of fisheries resources and alternate livelihood opportunities for fishing communities.

The present main challenge to the fishery sector in India is, therefore, to sustain the fishery production to meet the increasing demand to the next decade by keeping in the view that increasing fish production is no longer possible. Extra efforts are needed to properly manage the capture fisheries and to prevent their over exploitation. The warning signal has been alarming on the sustainable use of fishery resources because the catches in most areas exceeded the sustainable level. And hence there is a need to develop a suitable model to conserve the fishery resources.

The model which could be the most effective with the problem of conservation is given below. In the 45 days uniform fishing ban period there in the restriction of use of fishing vessels and this alone is not the most effective way of ensuring sustainability. Any attempt to conserve the fisheries resources would be incomplete without an effective restriction mechanism on both the number of fishing vessels (mechanised as well as non-mechanised) and duration of fishing operation. These restrictions must be compatible with each other and should not impose a high social cost to the fishermen by restricting employment opportunities.

Fishing quotas are worth considering as a system to restrict too many fishermen in the mechanised sector. For this careful estimation of the total available resources (X) and the Maximum Permissible Catch (MPC) or the Maximum Sustainable Yield (MSY) should be done and recruit every year by Department of Fisheries. This process should also involve fisheries research institutes, NGO's. But these fishing quotas should clearly determine what percent of resources can be exploited by the by the traditional and mechanized sectors respectively. This could either be determined by taking into account the past catch records, the average catch by both sectors over the years. But in this, we should consider that trawler fishing is relatively a recent phenomenon and the traditional communities, for whom fishing is not just a source of livelihood, but also a question of identity and culture which should be taken into account. As per the Government regulations, the mesh size of the cod end of the trawl net should be 25 mm. However, many of them are not following this which resulted in catching of juvenile fishes of valuable species and which is being now considered as trash fishes. So this should also be followed correctly.

Alternate livelihood opportunities for fishing communities

During the 45 days fish ban period the fishermen are in lack of employment and loss of income and hence fishermen should be aware of some alternate livelihood opportunities. Open sea floating cage culture is one of the important livelihood opportunities to the fishermen. One or two members, preferably youth, from each fishermen family or cooperative society should be given training in open sea floating cage culture.

The other alternate livelihood opportunity is preparation of value added fish products like fish balls, fish wafers, fish cutlets, fish pickles, prawn pickle etc. Preparation of these products will give the fishermen income and employment during the fish ban period. In addition to these, government is providing a relief amount of Rs.200/- per day and/ or Rs.9,000/- for 45 days and hence fishermen can meet their needs during these 45 days fishing ban period.

CONCLUSION

Almost all the respondents (94.44%) of the respondent were facing lack of alternative income generation other than fishing. Training should be given to the fishermen on various aspects like crab/lobster fattening, seaweed culture, production of dry fish, algal culture (*Spirulina*), and research on ornamental fish production to evolve viable technologies, as some of these can provide alternative employment avenues to the fishermen. In addition to this, providing good education to the fisherfolk would help them to seek alternative employment avenues in the hinterland.

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