Fishery Technology
2010, Vol. 47(1) pp : 85 - 90

Awareness of Fisherfolk on Fisheries Resource Management Issues: A Case Study

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The participation of fisherfolk in the selected aspects of fisheries resource management at Kuttapuly fishing village located in Tirunelveli district of Tamil Nadu was studied. The extent of awareness and opinion about fisheries resource management issues and acceptance in the implementation of fisheries development measures were probed. The constraints affecting fishing occupation in the study area were also identified.

Key words : Fisheries resource management, fisheries development measures, fishing constraints

Advancements in fishing technology have resulted in increased fishing pressure and exploitation of fishery resources at a faster rate. Fishing effort by the mechanized sector has enormously increased, at times leading to large scale destruction of juveniles and egg bearing fishes. The coastal fisheries need to be regulated for its sustainability, optimum exploitation of fishery resources and for ensuring livelihood of stakeholders. Even though small scale fishing occupation is techno-economic in nature, the community participation has an important role in planning overall fisheries development. Hence, the participation of stakeholders becomes important in resource management studies. Participation is the involvement of an individual, who has a common identity or at least some feeling of unity and certain goals and shared norms in a small face to face group (Guruswamy, 1987). Cohesiveness is the strength of the forces that keep the group together (Kuppuswamy, 1973). Sharma (1992) indicated group cohesion as a quality characterising the strength, unity and stability of personal interactions and relation in a group. Fishermen operate in a group and management decisions regarding their occupation are often taken in consultation with the peer group.

This paper discusses the results of a study conducted at Kuttapuly fishing village in Tamil Nadu on awareness of fisherfolk about fisheries resource management. The overall objective of the study was to assess the levels of cohesiveness in terms of social control, particularly with regard to participation in fisheries resource management and rural development. The study aims at evaluating opinions of fishermen on fisheries management issues and also on management and development measures taken by the authorities. It discusses on the challenges of the

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technocrats and policy makers on the implementation of conservation and regulatory measures for stock management, modification of fishing craft and gear as per fishermen's requirements and implementation of hygienic practices in fish landing centres.

Materials and Methods

Fishermen belonging to Tirunelveli district of Tamilnadu formed the study population. Tirunelveli is a coastal district with seven fishing villages out of which Kuttapuly fishing village was purposively selected for the study. The reason for selecting this fishing village was its compactness with consequent pointedness of data sets rendering meaningful generalisation in such a single community study. The major type of fishing craft operated in the district was *catamaran* fitted with outboard engine. The study was restricted to owner cum operators of catamarans fitted with outboard engine.

The number of fishermen households representing the catamaran with outboard engine category in the fishing village was 75. Complete enumeration of all fishermen households was done. The respondents were contacted individually and information on extent of awareness on conservation of fishery resources and their opinion on fishery development measures were collected. The opinion of fishermen on fisheries resource management issues *viz*., conservation of endangered species, decline in fish catch, capture of brood stock and juveniles and pollution in the coastal water was collected. The fisheries management measures like implementation of closed seasons, control of fishing effort and regulation of mesh sizes were also considered for evaluating the response of fishermen. The fisheries development measures such as avoidance of capture of brood stock and undersized fishes, fish aggregating devices (FADs) and protection of coral reefs and mangroves also became the subject of opinion collection among fishermen. Eight constraints about fishing occupation were also reviewed and opinion was collected from fishermen.

The fishermen's awareness and opinion in fisheries resource management aspects were studied using percentage analysis, chi-square test and Kendall's coefficient of concordance test (Siegel & Castellan, 1988). The Kendall's coefficient of concordance is given by

$$W= \Sigma\ (R_i-\bar{R})^2$$

where R_i is the average of the ranks assigned to the i^{th} object, and $\bar{R}$ is the average of the ranks assigned across all objects.

Results and Discussion

The extent of awareness of fisheries resource management issues by the fishermen respondents is presented in Table1. Some of the fisheries resource management issues include conservation of endangered fish species, decline in quantity of fish catch and size reduction, capture of brood stock and small-size fishes and pollution in the coastal waters. About 70 respondents (93.33%) were well aware of the fact that endangered fish species should not be captured and they followed it while fishing. About 5 respondents (6.67%) opined that they were not aiming to capture any endangered fish

Table 1. Awareness of respondents on fisheries resources management issues

Resource management issue	No. of respondents reporting that		
	Know and follow	Do not know	Know but do not follow
Conservation of endangered fish species group	70 (93.33)*	—	5 (6.67)
Decline in fish catch and size reduction	75 (100)	—	—
Capture of brood stock and small sized fishes	—	20 (26.27)	55 (73.33)
Pollution and sanitation	—	50 (66.67)	25 (33.33)

*(Figures in parenthesis indicate percentages)

varieties, but when they get any endangered fish varieties, they did not release them in to the sea and used to bring them to the landing centre for sale. All the 75 respondents felt that there was gradual decline in fish catch and also size reduction of the fish in the study area over the past ten years. About 20 respondents (26.67%) were unaware of the consequences that the capture of brood stock and small-sized fishes would result in the decline of total fish catch. The remaining 55 respondents (73.33%) gave their opinion that the practice of capturing of brood stock and small-sized fishes was wrong but they could not adopt the measures of conservation. The non-adoption of conservative measures was because of the reason that the fishermen cannot predict the nature of fishes caught through gill net hauls. The entire catch got through operation of gill net was marketed irrespective of brood stock and small-sized fishes. The percentage of respondents, who do not know that the discharge of domestic and industrial effluents would pollute the coastal ecosystem and the sanitary conditions in the fishing village and the fish landing centre, was 66.67. On the contrary, about 33.33% of the fishermen respondents reported that they were aware of the pollution and sanitation aspects in coastal zones, but in general they do not adopt the prescribed good practices.

The opinion of the reference group towards management of fisheries resources is furnished in Table 2. Chi-square (X^2) test was applied to test the opinion of the reference group towards the management of fisheries resources. The fisheries management measures considered were the implementation of closed seasons, control of fishing effort and the regulation of mesh sizes. Three types of responses viz., in favour of, indifferent to and opposed to; were recorded in the realm of fisheries management measures. The null hypothesis assumed that there was no direct relationship between the implementation of fishery management measures and attitude of the respondents towards these measures in the study area. The calculated value of chi-square (19.07) was greater than the table value (13.30 at 0.01% and 14.90 at 0.05% level) and hence the null hypothesis was rejected. Therefore, it is evident that the fisheries management measures, if implemented will go in a long way in ensuring

Table 2. Opinion of respondents towards fisheries resource management measures

Fisheries Management Measures	No. of respondents			
	In favour of	Indifferent to	Opposed to	Total
Implementation of closed seasons	2 (8.39)*	4 (3.40)	11 (5.21)	17
Control of fishing efforts	13 (12.83)	8 (5.20)	5 (7.97)	26
Regulation of mesh sizes	22 (15.79)	3 (6.40)	7 (9.81)	32
Total	37	15	23	75

*(The figures in parenthesis are the expected frequencies)

sustainability of fisheries resources in the coastal village of Kuttapuly.

The level of acceptance of the respondents towards the fisheries developments measures is presented in Table 3. Chi-square test was applied to find out the acceptance of the respondents towards the measures drawn for fisheries development. The fisheries development measures considered were avoidance of capture of brood stock and under-sized fishes, providing artificial habitats like fish aggregating devices (FADs) and protecting coral reef resources and mangroves. Two types of responses viz., agree and disagree were obtained. The null hypothesis assumed that the attitude of fishermen towards the goodness of fisheries development measures was indifferent. The calculated chi-square value (27.62) was greater than the table value (9.21 at 0.01% and 5.99 at 0.05% level) and hence the null hypothesis was rejected. Therefore, it is concluded that the fisheries development measures, if implemented, would play an important role in the overall fisheries development of the selected coastal village.

The constraints affecting the fishing occupation as reported by the respondents are furnished in Table 4. Kendall's, coefficient of concordance (W) was calculated to inter judge the consensus among the respondents by ranking the eight constraints affecting fishing occupation. The computed value of Kendall's coefficient was 6.739. The

Table 3. Attitude of respondents towards fisheries development measures

Fisheries Development Measures	Agree	Disagree	Total
Avoiding the capture of brood stock and under sized fishes	3 (13.67)*	22 (11.33)	25
Providing artificial habitats like Fish Aggregating Devices	8 (6.01)	3 (4.99)	11
Protecting coral reef resources and mangroves	30 (21.32)	9 (17.68)	39
Total	41	34	75

*(The figures in parenthesis indicate expected frequencies)

Table 4. Ranking of constraints to fishing occupation as reported by respondents

Term	Presence of rocks	Inter group conflicts	Absence of cold storage	Absence of kerosene bunk	Sea erosion problem	Absence of auction hall	Lack of spare parts/ service facility	Non availability of loans with subsidy to purchase OBE
R_i	267	261	380	235	448	391	324	320
$\overline{R}_i$	3.56	3.48	5.06	3.13	5.97	5.21	4.32	4.27
$\overline{R}$	4.375	4.375	4.375	4.375	4.375	4.375	4.375	4.375
$\overline{R}_i$ - R	- 0.815	- 0.895	0.685	- 1.245	1.595	0.835	- 0.055	- 0.205
$(\overline{R}_i - \overline{R})^2$	0.664	0.801	0.469	1.550	2.544	0.697	- 0.003	0.0110

eight constraints reported were presence of rocks in the near shore area, inter group conflict between the fishermen operating catamaran and mechanized boats, absence of cold storage facilities in the fish landing centre, absence of kerosene bunk, sea erosion during rainy season, absence of concrete auction hall, absence of spare parts/service centre for out board engine and non-availability of loans with subsidy to purchase out board engine. The selected respondents were asked to rank the eight constraints affecting the fishing occupation according to the order of severity. The null hypothesis formulated was that the ranking given by the respondents was unrelated to each other and there was no consensus among the respondents concerning the constraints. Refering to the critical values of chi-square table (df = 7), the calculated X^2 is 84.21 which was greater than the table value at 1% level and hence the null hypothesis was rejected. Therefore, it is seen that the respondent ratings are highly related to each other and there is good consensus among the respondents concerning the constraints affecting fishing occupation in the selected fishing village ($p<0.01$).

The high level of awareness and adoption of conservation of endangered fish species among fishermen is an encouraging sign for the policy implementing agencies. Similarly their concern about the dwindling fish catches and size reduction suggest that the authorities should intervene and implement the regulatory measures. The results of the study also indicate a challenge for technocrats especially in the fishing gear and craft for modification and improvisation of their gears and crafts to suit fishermen's needs. The low level of awareness of fishermen on pollution problems and their reluctance to follow and adopt the hygienic practices could be reduced by conducting sufficient onshore pollution abatement programmes and training and demonstration on onboard hygienic handling. Once the fishermen are assured of getting higher prices for their fish catch they will readily come forward to adopt any practices even if they have to incur additional costs. This is more evident by the large scale adoption of Global Positioning System by the present generation fishermen. Hence it is imperative of all other stakeholders to encourage fishermen to change their attitude towards

fisheries resources and development measures to the present trend.

References

Guruswamy, S. (1987) *Role of Women in Decision Making Process of Dry Land Farming, Tamilnadu*, pp 1-15, Tamilnadu Agricultural University, Madurai, India

Kuppuswamy, (1973) *Elements of Social Psychology*, 56 p, Vikas Publishing House Pvt. Ltd., London

Siegel, S. and Castellan, Jr. (1988) *Non Parametric Statistics for the Behavioural Sciences*, pp 124-136 & 262-272, Mc Graw – Hill Book Company, New Delhi

Sharma, B.B. (1992) *Encyclopedic Dictionary of Sociology, Vol. I*, pp 164-195, Anmol Publications, New Delhi, India