



Perception of Fishers on Fishery Information Service Dissemination in South Tamil Nadu

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Abstract

There is an increasing awareness about the potential of fishery information services. This study was carried out in the southern coastal districts of Kanyakumari, Thoothukudi and Ramanathapuram districts the Tamil Nadu state to explore the existing dissemination of fishery information services to the fishers and their perception towards fishery information services. A total of 180 *sranks* (master fisherman) of the vessels were selected as respondents representing mechanised and motorised sectors. Results showed that fishers were not using PFZ advisories regularly, due to the non availability of the information for all the fishing days, but 80.4% of the motorised and 76.8% of the mechanised sector had higher perception on the usefulness of PFZ advisories in terms of reduction in scouting time of fish, reduction in fuel consumption, increased CPUE and comparatively increased net profit. Fishers of the motorised (89.9%) and mechanised (89.2) sector also had high perceptions on the ocean forecast in terms of saving life and in getting updates on ocean and weather conditions. Regular information dissemination on a real-time basis is required for the services to be effective.

Keywords: Fishery information service, potential fishing zone advisories, ocean state forecast

Introduction

The state of Tamil Nadu has a coastal length of 1076 km with 591 fishing villages spread over thirteen coastal districts. (CMFRI, 2010) The state's coastal

population is 8.92 lakhs and about 2.60 lakhs fishers are actively engaged in fishing. The state ranks third in marine fish production in the country with a production of 4.67 lakh mt in the year 2015-16. The fishing fleet of the state is 6728 mechanized fishing crafts, 24160 motorized crafts and 32632 catamarans (Anon, 2012). Due to the increasing demand for fishery products and the need to exploit marine resources in a cost effective manner, the introduction and application of modern technology have become important considerations. Adoption of modern technology is needed for economizing the ongoing marine fishing operations and reducing human effort. In this context, the application of remote sensing technology in marine fisheries will not only be useful in achieving the objective of reducing the cost of fishing but also mitigating the human drudgery (Subramanian et al., 2014). Potential Fishing Zone (PFZ) forecasts based on remotely sensed chlorophyll concentration and sea surface temperature were applied for harvesting the unexploited marine fishery resource (George, 2013). Timely forecast of potential fishing grounds can be of help in optimizing the schedule of fishing operations (Nammalwar, 2012). In this context this study was taken up to explore the existing dissemination of fishery information service to the fishers and to assess the perception of the fishers towards the fishery information services.

Materials and Methods

The study was conducted in the Tamil Nadu state of India. Multi-stage sampling technique was used for selecting the respondents. Three districts namely Ramanathapuram, Thoothukudi and Kanya Kumari were purposively selected as they are dominant in fishery operations. From each district, three landing centres each for mechanised and motorised sectors were selected based on the geographical location

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and relative dominance in fishing operation. Ten *sranks* from each landing center were selected using snow ball technique. Semi-structured interview schedule was used to collect data. To measure the perception of the fishers towards usefulness of potential fishing zone advisories, the fishers were asked to indicate their level of perception on a five point Likert scale namely strongly agree, agree, undecided, disagree and strongly disagree with scores of 5, 4, 3, 2, and 1, respectively.

The perception score of each individual respondent was converted into perception index using the formula

$$\text{Perception index} = \frac{\text{Total score obtained}}{\text{Maximum attainable score}} \times 100$$

The constraints by the fishers in accessing fishery information service were collected through discussion with researchers, fishers and literature and were presented to the fishers to rank them as most important, important and less important with score such as 3, 2, and 1. The problems were ranked based on a cumulative perception index (CPI), which was worked out by finding out the ratio of cumulative score of each items to the total number of responses.

$$\text{Cumulative Perception Index} = \frac{\text{Cumulative score}}{\text{No. of respondents}}$$

Results and Discussion

It was observed that among the motorised fishers 62.2 % of them were middle aged followed by young (24.4%) and old age (13.3%). Majority (54%) of the fishers had middle school level of education followed by high school (22.2%), primary education (13.3%) and higher secondary education (4.4%). Most (91.1%) of the *sranks* owned motorised craft and very few (8.9%) were not having their own craft. In the mechanised sector, most (73.4%) of the fishers were middle aged followed by old age (23.3%) and young age group (3.3%). About 54.4% of them had middle school level of education and 2.2% had collegiate education. More than half (62.2%) of the *sranks* owned mechanised craft and 37.8% of the *sranks* does not have their own craft. All the fishers had television as it was given by the state government. Only 20% of the motorized sector fishers and 46% of the mechanized sector fishers had subscription to a newspaper. In motorized sector 6.5% of the fishers and 26.7% of the mechanised

sector fishers owned internet enabled personal computer. All the fishers both in mechanised and motorised sector had mobile phones, and 86% of the mechanised fishers possessed Very High Frequency (VHF) radio in their vessel. In motorised sector, fishers were not using VHF radio, as they go for single day fishing. In motorised sector 86.7% and 92.2% of the fishers possessed GPS and compass, whereas in mechanised sector all the fishers possessed compass and GPS. Majority (82%) of the fishers possessed echo sounder; but in motorized sector fishers were not using echo sounder. Hayrol et al. (2012) has reported that the use of ICT such as GPS, sonar and echo-sounder would assist the fishermen to find out the exact location of the fish.

According to Shenoi (2012) the different media used for dissemination of fishery information services are telephone, fax, electronic display boards (EDB), email, website, SMS, radio, television, local newspaper and village information kiosks. In the study area, five dissemination channels were observed for the dissemination of Fishery Information Services *viz.*, Electronic Display Board, Fisher Friend Mobile Advisories Service, newspaper, Internet and disaster monitoring cell.

Electronic Display Boards were established in the fishing harbours for disseminating real time fishery information service effectively. In south Tamil Nadu, EDBs were installed at seven fishing villages, which were under the supervision of MSSRF Village Resource Center (VRC). There are two EDB installed at Mandapam and Thangachimadam fishing village at Ramanathapuram district, five EDB were installed at Kovalam, Kadiyapattinam, Manakudi, Colachal and Thoothoor fishing villages at Kanyakumari district.

MSSRF has collaborated with private companies and developed a program called Fisher Friend Mobile Advisories (FFMA). Fishermen could use the application to access vital updates on wave height, weather, and PFZ advisory, news alerts, government schemes and latest market prices in the local language by sending a single-button-click request from the Fisher Friend software on their mobile phones. Today this service is availed by the fishers of the Ramanathapuram and Kanyakumari districts of south Tamil Nadu, twice in a day. Antony (2011) in her study on the communication parameters in the marine fisheries sector of Kerala had reported that the main communication device used

in the Kerala coast was mobile phones. The Fisheries College and Research Institute, Thoothukudi is disseminating PFZ advisories through local newspaper to the fishers in the district from 2005. It had reached 33.3% of fishers from the mechanised and motorised sector of the district, but 23.3% of the motorised sector fishers and 14.4% of the mechanised sector fishers used this advisory occasionally and the remaining fishers used it rarely. The Fisheries College receives the PFZ advisories from the INCOIS, translates it into Tamil and gives it to the local newspaper. This process takes two days and the information reaches the fishermen on the third day. In addition to this, the information is not available for all the fishing days for all the landing centers. Even though the newspaper reaches the entire fisher population in Thoothukudi district, usage of PFZ advisories in news papers was very low. The reason may be that the information received through the newspaper is disseminated to the fishermen with time lag and based on this information if they venture into the sea the fish schools they found were very less, as reported by the fishermen.

The Website & Ocean Portal based dissemination of the fishery Information Service of INCOIS started in September 2003. The web-based ocean information and advisory services *viz.*, Potential Fishing Zone advisories, Ocean State Forecast (OSF), Indian Argo Project and Tsunami warning system were developed with Web-GIS technology. The web-based multilingual on-line data and information delivery system with Web-GIS capability enables the users to query, analyze, visualize, and download ocean data, information and advisories for their regions of interest.

According to the study, 2.2% of the motorised fishers and 8.9% of the mechanized fishers used internet enabled personal computer for getting PFZ advisories occasionally, because PFZ advisories was not given to all the fish landing centers for all the days. Though the fishers got the awareness through MSSRF VRC. A study conducted by Jayapradeep & Raman Nair (2014) revealed that village level information centres, and NGO centres are mostly preferred by fish farmers over institutional centres and department offices. Persons who were having use to internet enabled personal computer were found to use Ocean State Forecast, and 12.2% of the mechanised and 2.2% of the motorised sector fishers used it occasionally and 15.6% of the mechanized

sector fishers used it rarely. This is in conformity with the findings of Jayapradeep & Nair (2014) who reported that mobile phones and internet were the preferred media by the fishers.

More interestingly mechanised fishers of Pampan landing center were receiving wind and wave forecast from the Weather Underground, a USA based organization, but the fishers were unaware about the services of the INCOIS. The Department of Fisheries has started to disseminate ocean state forecast during monsoon for alerting the fishers. A disaster monitoring cell was established in the fisheries department head quarter which is receiving OSF service from INCOIS and disseminated it to the district Assistant Director of Fisheries office and fishers were alerted through church, boat owners association and cooperative societies. The important issue in accessing PFZ advisories is the lack of awareness on the PFZ advisories. Most of the landing centers had the EDB or FFMA. However a few of the landing centers were not having access to this and poor infrastructure facilities of the landing centres may be the reason which restricts the reach of PFZ advisories to the fishing community.

Table 1. Perception of the fishermen towards the fishery information service:

Perception index	Motorized sector (n ₁ =65)	Mechanized sector (n ₂ =75)
Perceived usefulness of PFZ advisories	80.4	76.8
Perceived usefulness of OSF advisories	89.9	89.2

Table 1 indicated that most of the motorized (76.8%) and mechanized (80.4%) fishers had high level of perception on PFZ advisories as it reduced scouting time and fuel consumption. They also felt that using the advisories for fishing operation had resulted in high Catch Per Unit Effort (CPUE). A reliable and timely advisory on the potential zones of fish aggregation will benefit the fishing community to reduce the time and effort spent in searching the shoals of fish, thus improving the profitability and hence, the socio-economic status. The validation of PFZ forecasts by ESSO-INCOIS have inferred substantial increase in fish catch along northwest coast of Gujarat (Solanki et al., 2001; 2003; Nayak et al., 2003; Dwivedi et al., 2005) and all over the country (Choudhury et al., 2002). Pillai (2010)

observed that where fishing is targeted at a pelagic resource which is migratory in habit, the PFZ will definitely provide an advantage in terms of reduction in scouting time, in turn resulting in reduction in the consumption of fuel and human effort and also an increase in CPUE which ultimately will make the fishing operation economically viable.

Fishers of both motorised (89.9%) and mechanised (89.2%) sector perceived OSF as far better than their traditional knowledge on weather prediction. The reason was that with their traditional knowledge they predicted the present sea condition but not the sea conditions in the subsequent days, whereas OSF provides state of sea for five days well in advance, helping them to plan for a safer fishing voyage and thereby coordinating the fishing operation.

Table 2 revealed that the major constraints in accessing PFZ advisories by the motorised (2.92) and mechanised (2.88) fishers, which were the non availability of PFZ advisory for all the fishing days. It is available only for three days and fishermen felt that it should be there for all the fishing days as it was beneficial to them. Cloud cover affects the generation of PFZ advisories. Even though it gives the congregation of fish shoals but many a time, the fishermen were constrained to catch fish from the specified location on time. This reduces their dependence on the PFZ advisories. More focus is to be given on the validation of potential fishing zone advisories, generation of PFZ advisories and to disseminate information on a real time basis to all fishers and landing centers.

Most (2.75) of the mechanized sector fishers felt that PFZ advisories are useful in locating the likely congregation of the pelagic fish shoals rather than demersal fishery resources. Subramanian et al. (2014) reported that the fishermen in the state of Goa received the forecast programme with particular reference to pelagic fisheries. So these advisories are not of much use to trawlers targeting demersal fishes. Both the fishers of the motorised (2.52) and mechanised (2.86) sector felt that the PFZ advisories were not providing information on the type of the fish available in a particular location. Motorised sector fishers are using different kind of gears to catch different type of fishes with different size, and unavailability of species specific information is not supporting them in selection of gears. More focused research studies have to be undertaken on the species specific information for commercially valuable and underexploited species.

Majority (2.39) of the mechanized sector fishers felt that they could not access PFZ advisories for multi day fishing operation. Majority (2.68) of the mechanized fishers and motorized fishers (2.2) felt that they do not have timely access to the OSF services, if they are at sea. Communication access is very difficult beyond certain distance from the shore. Traditional fishermen can be benefitted by PFZ forecast when they are near the shore. Subramanian et al (2014) observed that younger fishers mostly relied on the forecast, rather than traditional prediction, as they are aware that new technologies results in profit and safety. Fisherman required OSF

Table 2. Cumulative Perception Index (CPI) of Constraints faced by the fishers on PFZ

Constraints	Motorised (n ₁ =65)	Mechanized (n ₂ =75)
Potential fishing zone advisory is not available for all the fishing days	2.92	2.88
PFZ advisory is not given separately for motorized sector and mechanized sector.	2.83	2.81
Non availability of location specific OSF information all along the fishing operation.	2.72	2.83
PFZ advisories is not providing species specific information	2.52	2.86
PFZ advisory increasing pressure on particular fishing ground	2.46	2.81
PFZ advisories are not for demersal fishery resources	2.25	2.75
Not having timely access to the OSF while at sea	2.2	2.68
Lack of technological infrastructure	2.06	2.07
Lack of computer proficiency	1.95	2.37
Lack of knowledge regarding potential fishing zone advisory	1.84	2.14
PFZ is not a much credible source of information	1.6	1.59

information on real time basis and all along the route. This is essential for deep sea fishing and multi day fishing operation, because most of the time multi day fishing operation fishers faced cyclones, high waves and winds at mid sea. Most of the motorized (1.84) and mechanized (2.14) fishers felt that lack of proficiency in using the modern communication equipments is a hurdle for the better usage of PFZ advisory and OSF services. Fishers seek hands on training in using modern communication and technical gadgets for fishing operation. Training is to be conducted preferably during the fishing ban period by involving various institutions such as Department of Fisheries, Tamil Nadu, Central Institute of Fisheries Nautical and Engineering Training, Cochin and Indian Coast Guard.

Fishery information services have become a significant input from the science and technology sector to the fishing community. Remote sensing and GIS technology can be used to manage fisheries at sustainable levels and also guide the fishing fleet to increase their catch per unit effort. Good communication equipment with the state of art space science technology will ensure the safety of the fishers by delivering real time information on ocean state forecast and potential fishing zone advisories. This will improve the socio economic condition of the fishers and can bring a new paradigm shift in marine fisheries of India.

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