

Harbour Based Fisheries Management in Thoothukudi District - A Case of Thoothukudi Fishing Harbour

M.S.Madan, Ranjit, L., Radhakrishnan, K., Kandhan, K.P., Aswathy, N.
Tuticorin Research Centre of Central Marine Fisheries Research Institute
Tuticorin.

Introduction

Thoothukudi District having a coastal line of 163.5 km stretches from Vembar in the north to south of Manappad (i.e., between 8° 9' 00" to 9° 7' 30" N latitude and 78° 2' 30" to 78° 25' 00" E longitude). Thoothukudi fishing harbour (TFH) is one of the oldest fishery ports in the east coast of India. Due to its commercial and economic importance from the marine fisheries point of view, nowadays it is considered as one of the major fishing harbours on the east coast of India. For the sake of easy management the fishing areas are divided into north of Thoothukudi and southern Thoothukudi. Of which the southern area cover up to Chinna muttom in Kanyakumari district and northern side covers up to Ervadi in Ramanathapuram district. TFH is a landing centre which follows the unique rules and regulation of Tamil Nadu Marine Fisheries Regulation Act and Wild Life Protection Act as well. All the mechanized fishing vessels are operating above 3 Nautical miles from the sea shore and the fishing time is restricted between 5.00 am and 9.00 pm. Single day fishing and the fishery is characterized by multi-species, multi-fleet with multi-sized boats. Even though multiday fishing is economically beneficial but it is not followed for the sake of resource conservation and adherence to local socio-economic constraints.

The marine fish production of Thoothukudi fishing harbour was highly fluctuating from 2005 to 2012 and the annual catch has declined from 32,472 tonnes to 23,957 tonnes. The reduction in catch may be attributed to increased number of fishing units ultimately leading to less catch per unit effort and higher cost for fishing. For the sake of economic benefit fishers may catch the juveniles and non-targeted species as by-catch. Hence, there is a need to sustain the marine fisheries resources for the future generation, therefore an emphasis on management of the fisheries resource with different institutional participation coupled with different stakeholders plays a vital role. The present paper deals with various institutional arrangements exist in TFH for the management of marine fisheries and an exhaustive analysis made on the cost and returns of single day fishing.

Material and Methods

The primary data for a period of six months covering 2012 to 2013 was collected by simple random sampling method was used for the cost and returns analysis.

Net revenue = Total Gross Revenue - Total Expenses (Total Fixed Cost + Total Operating Cost)

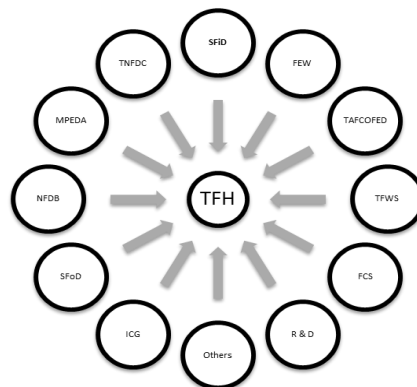
Facilities in TFH

TFH was constructed in 1968 which has 21 acres of reclaimed total land area and 2.7 acres of berthing area with a depth of 3 m to 4.5 m to accommodate about 400 medium sized mechanized trawlers. The length of the breakwater wall at seaward side is 1200 m. The fishing harbour includes different units such as jetty (800 m length), Warf (700 m length), two finger jetties (50 × 15 m), break water (150 m length), single sleep way (65 × 10 m), three auction hall, one ice plant, three Diesel pumps, one base workshop, one MPEDA storage, one overhead tank, five syntax tanks, office of Assistant Director of Fisheries (Thoothukkudi), Assistant Director of Fisheries (Fisheries Harbour Management) and Engineering Division of Director of Fisheries for construction and maintenance of existing Fishing Harbour. There are 307 mechanized fishing boats registered/re-registered with State Fisheries Department/Marine Product Export Development Authority (MPEDA). The number of boats added into operational fleet has gone up from mere two in 1998 to a maximum of 49 in 2010. The catches of the registered fishing vessels are landed in this harbour. The harbour has fish landing place with a separate hall/platform for prawns, lobsters, goatfishes, cephalopods, big fishes, small fishes, rays and trash fishes.

The ongoing National Fisheries Development Board (NFDB) project which includes fixing and strengthening of Warf, parking areas, loading areas, internal concrete road, improvement of electrical arrangements, sleep way renovation and extension of 6 m drainage. To enhance hygienic handling, the drainage was planned to include sewage treatment plant so that treated water will be used for washing the auction hall and remaining water could be pumped into sea.

Institutional arrangements in TFH

**Figure 1: Various participants involved in Thoothukkudi Fishing Harbour (TFH)
SFID - State Fisheries Department**



The Assistant Director of Fisheries (Fisheries Harbour Management) plays a major role in overall management of the TFH. The Assistant Director of Fisheries (Thoothukkudi) is one of the leaders of the management committee of TFH.

State Fisheries Department is responsible for registering the fishing vessels when the length of the fishing vessel is less than 20 m or horse power of the engine less than 150 and if more that that registration could be done with MPEDA. The fuel subsidy was give only to the state fisheries department registered vessel under supervision of Inspector of Fisheries of TFH. The State fisheries department distributes the fuel to fishing vessel of 1500 liters per month or 15,000 liters per annum. All welfare scheme payment during ban and lean periods and other subsidizing schemes are distributed through State Fisheries Department. There is separate account for the regulation of fishing harbor management which regulates the activities in fishing harbor regularly. It includes fuel to fishing vessel, generator, fuel expenses, tube light charges, washing the fishing harbor after the auctioning, vehicle regulations etc.

FEW – Fisheries Engineering Wing

The Chief Engineer facilitates the construction and renovation of the TFH. The ongoing construction cum renovation work was funded by NFDB and is being carried out based on the fishers need.

TNFDC – Tamil Nadu Fisheries Development Corporation

The Managing Director provides facilities for fish marketing, construction and repair works at TFH. Supply of subsidized diesel and facilitation of kerosene for the fishing crafts are provided to the fishers under the control of TNFDC. TNFDC is the responsibility for creation of hygienic fish handling facilities at TFH.

TAFCOFED – Tamil Nadu State Apex Fisheries Cooperative Federation Limited.

The Special Officer provides and maintains diesel bunks and supply tax exempted diesel to TFH and it provides diesel to Vembar and Tharuvaikulam fishing villages of Thoothukudi district.

TNFWB – Tamil Nadu Fisheries Welfare Board

The Member-Secretary provides social security to the fishermen and laborers of TFH engaged in fishing and allied activities. TNFWB not only provide supports to fisheries management but also provides financial assistance towards educational scholarship for fisherman family, sea and accident death, physical handicraft, natural death, marriage and others.

MPEDA – Marine Product Export Development Authority

MPEDA plays a major role in production, induction of new technology, modernization of processing facilities, development of infrastructure facilities and market promotion. Under the fish production, financial assistance for constructing new fishing vessels, of Rs. 10 lakhs for vessel size between 18 and 20 m, Rs. 15 lakhs for vessel size more

than 20 m. MPEDA also provides financial assistance for the upgradation of existing fishing vessels for post harvest operation and preservation. MPEDA registration on high horse power engine fishing vessel in TFH helps in up-gradation of the processing and post-harvest operations. It also provides financial assistance for implementation of cold chain for better hygienic practices, onboard storage facilities and road transport facilities with cold storage.

FCS - Fisheries Co-Operative Societies

Extends much of the Government welfare Schemes to the members of TFH. Under these schemes fishers are getting Rs. 4000 during fishing ban period and Rs. 2000 during fish lean period.

NFDB- National Fisheries Development Board

NFDB provides financial assistance for the implementation and up-gradation of existing facilities of TFH. NFDB provided Rs.12.05 crores as a fund for the development of TFH. It helps for the handling and up keep of fishes in a more hygienic way.

SFoD - State Forest Department

The state forest officials play a vital role in policing the fishermen of TFH on catching the protected animals. It helps to regulate the marine fisheries management in a better manner. Island maintenance, monitoring, making awareness about endangered species etc. and also the department take strict action on fishers catching species.

ICG - Indian Coast Guard

Indian Coast Guard helps in patrolling and safeguarding the mechanized boats from TFH that enters in to the International Maritime Boundary Line. The surveillance of fisherman and protecting resources or depleted by entry other country fishers.

R & D - Research and Development Organisations

Central Marine Fisheries Research Institute, Fisheries College and Research Institute, Suganthi Devadason Marine Research Institute and Gulf of Mannar Biosphere Reserve Trust play an active role in Research and Development of Thoothukkudi Fishing Harbour. These organization gives advice for the management of fisheries stock, ecotourism to protect the endangered species, and sea ranching.

State Fisheries Department and Fisheries Associations

Department of fisheries plays an important role in dealing with the issues related to fishing regulation, conflict resolution and regulation of fishers welfare schemes. Additionally, the TFH has a fisherman cooperative society, of which all the fishermen are members but it was differentiated into labour and owner society.

All the mechanized boat owners are organized under the Thoothukudi boat owners association. Each member of this association has ownership of single or multiple fishing vessels. This organization comes under the labour union at the district level. One of the major activities of this association is conflict management between labour and owner, country boat and mechanized boat. For instance, when a conflict needs to be resolved, representative from country boat and another representative from mechanized vessel, have a meeting with association along with officer from state fisheries department. Generally, two type of gear damage issues are dealt by the association i.e. identified fishing vessel and non-identified fishing vessel. The decision is made between the representative of country craft and mechanized craft in the presence of officials from fisheries department.

Associations are formed independently and as per need they formulate their own rules and regulation within the association. For example, Muthu nagar vessel association was divided into two groups on the basis of vessel size, are of less than 50 m and more than 50 m length.

These associations also describe the banned fish species as well as creating awareness towards the member. If any mistakes happened they won't get any support from the association to escape on the crime. Due to single day fishing, fishers are not getting enough time to get the catch, many days they returned to shore without meeting the operational expenses. It may not be economically viable but in biological point of view it is good and sustainable. To meet the expense the fishers are forced to catch juveniles and non-targeted species.

Usually, fishing time is between 5.00 am and 9.00 pm. The fishing vessel has to leave the shore at 5 am of the day and return back to the shore or enter in the harbour before 9 pm. There will be a penalty for later departure and chain in the entry point opened only after the payment. The time management was regulated by State Fisheries Department.

Wind season is traditional methods of identifying the fishing season till followed by TFH fishers and on the basic of season they are categorized into four fishing periods, such as 'Sirukodai' between mid-April to mid-August, 'Kontal kaatru' for the period of mid-August to September, October and November are rainy season and 'Vaadai Kaatru' during the month of December and January.

Management committee

The fishing vessel owner association selects a leader and creates a joint account with the Joint Director of Fisheries (Thoothukudi) and each vessel owner will deposit money to that account once in a month. The deposited money is used for the management of harbour such as maintenance of the harbour lights, generator fuel etc. Vehicle entry token/pass has been maintained by the State Fisheries Department officials to maintain and regulate the harbour management in TFH. The amount charged for different vehicles entering in the TFH are given in the table.

Table 1: Entry fee for different vehicles at TFH.

Sl. No	Vehicle	Rs/vehicle	Minimum and maximum no of vehicle
1	Cycle	2	110-130
2	Two motorcycle	5	120- 160
3	Load Auto	50	21-35
4	Ice breaker	50	25
5	Jeep	50	51-65
6	Van 407	100	12- 20
7	Tata ace	100	87-110
8	Covered ice truck	200	19-30

Management during Seasonal Banns

Capture fisheries in Thoothukudi fishing harbour has been banned from 15th April until 29th May. The decision was taken by the Ministry of Agriculture, Animal Husbandry and Fisheries and agreed by industry representative. This measure allows for protection of the species, enabling it to regenerate. In East coast fishing was closed for 45 days, during this scheduled time to conserve stock.

Fisheries Legislation:

According to the Tamil Nadu Marine Fisheries Regulation Act (1983), multiday fishing was banned in entire Tamil Nadu, but these rules was not followed by all the marine fishing coastal districts of Tamil Nadu but it is exception in Thoothukudi district. From the management point of view, the Wild Life Protection Act, Tamil Nadu Marine Fisheries Regulation Act, state and central government rules are regulating the rules and regulation in fishing actives. The coast guard as well as state fisheries department are monitoring the fishing actives in Thoothukudi fishing harbour.

The average annual capital investment was Rs. 27, 10,000, which can generate a net perfect income of Rs 14, 23,510 through fishing activities in TFH. The analysis shows that, the investment cost is very high and operating cost constitutes 75 to 80 % of the gross revenue. However, the annual average fishing days are around 187 days for mechanized fishing crafts which operates in TFH. The interest rate of capital investment was 12%, and annual depreciation was computed by the straight line method.

Economic Analysis of Single Day Vs Multiday Fishing

The single day and multiday fishing economics of India was estimated by the Narayanakumar *et al.* (2009). This result showed that multiday fishing has been generating higher gross revenue per fishing trip as compared to single day fishing. But, Thoothukudi

fishing harbour has been regulating single day fishing, even though one knows about benefits of multiday fishing. It shows an importance given to preserve resources.

Table 2. Economics of Fishing at TFH

Particulars	Details of amount (Rs.)
Capital investment of mechanized fishing unit	27,10,000
Annual fixed cost	
Annual depreciation	2,43,900
Interest loan for capital investment (12%)	2,43,900
Berthing charge	8,700
Vessel registration fees	83
Total fixed cost (A)	4,96,583
Annual operating cost	
Fuel	80,19,756
Bata	32,83,700
Food	4,38,455
Ice	4,37,265
Auction charge	13,80,037
Repairs and maintenance	61,200
Total operating cost(B)	136,20,413
Total cost per year (A+B)	141,16,996
Annual average catch (tonnes)	2,59,718
Gross revenue (Annual)	164,50,620
Net profit without deducting the labour remuneration	23,33,623
Labour remuneration/ year	910,113.2
Net profit	14,23,510
Average annual fishing days	187

Table 2: Economic performance of single day trawling (2001-2005).

Sl. No	Details	East coast	Percent to total	West coast	Percent to total	All India	Percent to total
1	Wages	2266	38.35	1766	23.39	2016	34.13
2	Food & bata	134	0.44	30	0.29	82	1.39
3	Auction charges	1040	1.41	161	5.86	601	10.17
4	Others	594	0.84	449	1.10	521	8.82
5	Total operating cost	7361	100.00	4454	100.00	5907	100.00
6	Gross revenue	15714		7465		11589	
7	Net operating income	8353		3012		5682	
8	Capital productivity	0.60		0.60		0.60	
9	Catch per trip	471		373		422	
10	Average crew size Labour	6		6		6	
11	productivity	86		62		74	

(Catch per trip in kg; Labour productivity in kg/crew/trip)

Source: Narayanakumar *et al.* (2009).

Table 3. Economic performance of multi-day trawling (2001-2005).

Sl. No	Details	East coast	Percent to total	West coast	Percent to total	All India	Percent to total
1	Fuel	17749	55.11	18392	59.73	18070	57.37
2	Wages	9416	29.23	6968	22.63	8192	26.01
3	Food & bata	293	0.91	289	0.94	291	0.92
4	Auction charges	1160	3.60	1363	4.42	1261	4.00
5	Others	3591	11.15	3781	12.28	3686	11.70
6	Total operating cost	32207	100.00	30792	100.00	31500	100.00
7	Gross revenue	56274		49199		52737	
8	Net operating income	24067		18407		21237	
9	Capital productivity	0.58		0.62		0.60	
10	Catch per trip	1675		1891		1783	

11	Average crew size	7	7	7
	Labour productivity	251	276	263

(Catch per trip in kg; Labour productivity in kg/crew/trip)

Source: Narayanakumar *et al.* (2009).

The analysis study showed that higher economic benefit was found in multiday fishing for east coast, west coast and at all India level. In the east coast of India for multiday trawling the operating cost was Rs. 7, 361 gross revenue at Rs. 15,714 and the remaining Rs. 8, 353 is the net profit, but in the case of 2-5 multiday fishing, profit was around Rs. 24,067 and operating cost was Rs. 32, 207, which had the gross revenues around Rs. 56,274. The above example indicates that, multiday fishing earns higher benefit as compared to single day fishing.

Conclusion

There is a need to preserve and sustain the marine fishery resource of India, which is dwindling fast. Better management of marine fishery resources is the need of the hour considering the livelihood of the fishers and augmenting the availability of animal protein to growing population. Single day fishing was not strictly followed in most districts of Tamil Nadu as it not economical and lucrative as that of multiday fishing. For sustainable harvest, marine resource has to be managed by following the rules and regulations and fishers should make use of institutional support and policy measures to conserve the marine fishery resource for the future generation.
