

## Socio Economic Impact of Trawl ban on the livelihood of Marine Fishers' of Palk Bay, Tamil Nadu

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### ABSTRACT

Indian fisheries sector has witnessed phenomenal growth in marine fish production over the decades, with the modernization of fishing crafts and technology, thereby resulting in fluctuation of the same, thus rendering intense debate on growth and instability. To ease the production trend in a sustainable way and to conserve the dwindling marine resources, the monsoon trawl ban was introduced in 2001 in Tamil Nadu. The seasonal fishing ban has been one of the very few significant management measures for the sustenance of the marine resources since its preamble. Though remarkable upsurge in marine fish production was achieved post implementation of ban, yet, it had generated issues in employment, poverty and income generation of fishermen during the ban period and was always a matter of turbulence among mechanized and traditional sector of fishing. It is also alleged that the enhanced marine fish landings could also be a case of fishing in and out of the waters off Tamil Nadu coasts. We made an attempt to understand the social and economic impact of fishing ban on the livelihood of marine fisherfolk and to study the viability of different marine fishing units (Motorized and Mechanized) in Tamil Nadu. The overall employment loss and loss in labour income during the ban period was also assessed. The fishermen's constraints during the ban has also been ranked and suggestions given to improve the livelihood security of the marine fishers' in the Palk bay area.

**Keywords:** fish production, trawl ban, employment loss, livelihood security.

### INTRODUCTION

Tamil Nadu is an important maritime state of the country with 1.9 lakh sq. km of Exclusive Economic Zone (EEZ) and continental shelf of 41,412 sq.km. The Fisheries sector contributes about 0.7% to the Tamil Nadu Gross State Domestic Product (GSDP) at current prices in 2014-15<sup>1</sup>. To ease the production trend in a sustainable way and to conserve the dwindling marine resources, the monsoon trawl ban was introduced in 2001 in Tamil Nadu. The system of appending fishing activities during the monsoon period was customary to the

west coast of India prior to 1970 itself<sup>2</sup>. Fishing/ trawl ban has been one of the significant regulatory measures for the sustenance of the marine resources since its preamble. However, the marginal increase in catches along the coast of Tamil Nadu after the introduction of fishing ban is essentially due to increase in efficiency of craft and gear and extension of fishing effort during the last decade. A national study was conducted for the period 1985-2008 on the impact of seasonal fishing ban and concluded that there is no significant difference in catch and Catch Per Unit Effort (CPUE) trends before and after the introduction of seasonal fishing ban along the west coast<sup>3</sup>.

Nevertheless, numerous disagreements cropped up stating the lack of scientific relevance in ban implementation during the monsoon period and its adverse effect on the living of trawl workers and labourers. Considering this, the current study was carried out in Tamil Nadu with a prime objective of mapping the social and economic impact of fishing ban on the marine fisheries sector. Fishers' opinion on resource conservation and their constraints during the ban period have also been ranked. Policy recommendations with respect to creation of alternative employment opportunities for those engaged in mechanized and motorised sector during ban period have been suggested.

It was reported in Maharashtra that, the discrepancy in the income levels of trawl labourers during the seasonal fishing ban and the non-ban period was very high resulting in a considerable difference in their livelihood<sup>4</sup>. Similarly in Kerala, only around 10% of the mechanised labourers are engaged in fishing in the traditional sector during the fishing ban period and the relief amount given by the trawl owners and public organizations are sparse and inadequate for their livelihood. Most of these workers dreadfully depend on private money lenders during this period<sup>5</sup>.

The present study focuses on the impact of ban on the livelihood security of mechanized workers. The overall employment loss and loss in labour income during the ban period was also assessed. The fishers constraints during the ban has also been ranked and suggestions given to improve the livelihood security of the marine fishers<sup>7</sup>.

## MATERIALS AND METHODS

Primary data with regards to the social and economic factors of employment and income loss to mechanized workers and those engaged in fishing across Palk bay in Tamil Nadu were collected by survey method in selected landing centres of Ramanathapuram, Pudhukottai and Nagapattinam districts. The sampling criteria used for the study was based on the higher concentration of crafts. The sample size comprised 180 respondents totally (60 from each district). It was ensured that sample frame had equal proportion of mechanized (30) and motorized fishing units (30) through simple

random sampling method. The respondents were interviewed with the pre-tested survey schedule. Social and economics loss (in terms of labour days and labour income) for the state due to monsoon ban was also assessed based on their average daily wages (income) earned in each fishing sector. Data on alternative employment opportunities during the ban period for the mechanized and motorized labourers in fishing, fishing allied and non-fishing activities were also gathered.

The fishers' opinion on alterations in the fishing ban were analysed by developing Opinion Index. From the response score, each index was calculated by the ratio of actual score obtained to the maximum score possible and expressed in percentage for each respondent<sup>6,7</sup>. Mean  $\pm$  SD value of the respondents was taken as index for the particular criterion.

Primary data corresponding to the fishers' perception on constraints during the trawl ban period were collected exclusively for mechanized and motorized labourers and the same were analyzed using Garrett Ranking technique. The order of the merit given by the respondents was converted into ranks using the following formula:

$$\text{Percentage position} = \frac{100 \times (R_{ij} - 0.50)}{N_j}$$

Where  $R_{ij}$  = Rank given for the  $i^{\text{th}}$  item by  $j$  individual,  $N_j$  = Number of items ranked by  $j^{\text{th}}$  individual. The percentage position of each rank was further changed into scores with table reference<sup>8</sup>.

## RESULTS AND DISCUSSION

### Employment and labour income loss in fishing in Tamil Nadu

The details on the number of fishing crafts have been sourced from the State Fisheries Department through their online fishing craft registration portal for the current year. Social and economics loss (in terms of labour days and labour income) during the ban period was assessed for an average of 39 fishing days excluding Sundays and fishing holidays. Nearly nine million man days

seems to be lost during the ban period resulting in an economic loss of 396.37 crores to the mechanized and motorized fishing sector (Table 1).

Similar work has been reported for the state of Kerala, with the loss of about one million man days during the ban period resulting in an economic loss of 50.30 crores to the mechanized sector<sup>9</sup>. Major loss in Tamil Nadu happens in the motorized fishing sector which constitutes to about 80% of the state's fishing crafts.

#### Employment and labour income loss in fishing in Tamil Nadu - Nagapattinam district

By and large, in Nagapattinam district, the mechanized crafts are involved in multi-day fishing. While the trawlers fish 3 – 4 days per trip; long liners extend still further to 7 days per fishing trip. In this district, the employment loss and labour income loss during the ban period was valued for an average of 15 and 39 fishing days excluding Sundays and

fishing holidays in the case of mechanized and motorized crafts respectively. Over one million man days seems to be lost during the ban period resulting in an economic loss of 53.09 crores to the mechanized and motorized fishing sector (Table 2).

#### Employment and labour income loss in fishing in Tamil Nadu - Pudhukottai district

In case of Pudhukottai and Ramanathapuram districts, the number of fishing days varied across motorized and mechanized sector due to the existence of three day-four day rule. By this rule, the vallams and trawlers fish alternately, with the trawlers and vallams fishing three and four days per week respectively<sup>10</sup>. Hence accordingly the number of fishing days was arrived at 19 and 26 days in case of Mechanized and Motorised craft respectively. Furthermore, the average crew size varied distinctly from that of Nagapattinam district, with the mechanised and motorised crafts carrying

**Table 1: Employment and labour income loss in fishing in Tamil Nadu during fishing ban period**

Category	No. of units	No. of fishing days	Average crew size	Income loss per day per labourer (Rs)	Total employment loss (in man days)	Total loss in labour income (Rs.lakhs)
Mechanised crafts	5263	39	9	600	18,47,313	11084
Motorised crafts	26147	39	7	400	71,38,131	28553
Total	31410				89,85,444	39637

Source: Primary data

**Table 2: Employment and labour income loss in fishing in Nagapattinam district**

Category	No. of units	No. of fishing days	Average crew size	Income loss per day per labourer (Rs)	Total employment loss (in man days)	Total loss in labour income (Rs.lakhs)
Mechanised crafts	1211	15	9	600	1,63,485	981
Motorised crafts	3963	39	7	400	10,81,899	4328
Total	5174				12,45,384	5309

Source: Primary data

6 and 7 members respectively for a single trip. The overall employment loss in mechanized sector was arrived at 44,574 man days, which alone contributed to the labour income loss of Rs. 2.67 crores for the whole fishing ban period. Likewise, the overall employment loss in motorized sector was to the expanse of 1.5 lakh man days, accounting to the labour income loss of Rs. 5.66 crores (Table 3).

#### Employment and labour income loss in fishing in Tamil Nadu - Ramanathapuram district

In Ramanathapuram district, around seven lakh man days are gone in the fishing ban period yielding to a loss in labour income of 31.40 crores. By and large, the employment loss in mechanized fishing sector alone was arrived at 1, 94,370 man days, which accounted to a labour income loss of Rs. 11.66 crores for the whole ban period.

Likewise, the total employment loss in motorized sector was to the expanse of 5 lakh man days, resulting in a labour income loss of Rs. 19.74 crores for the same period (Table 4). Similarly, the overall employment loss in the entire mechanized

sector was found to be 15 lakh man days, causing a labour income loss of Rs.51 crores across the ban period<sup>5</sup>.

#### Opinion index of fishermen and scientists regarding the fishing ban

A technical committee framed by the Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), for evaluating the duration of fishing ban recommended that the seasonal fishing ban be observed in the Indian EEZ from 15 April to 14 June (61 days) along the East Coast and during 01 June to 31 July (61 days) along the West Coast and that the ban shall apply to all types of vessels except the traditional non-motorised units. Based on this, consensus of the fishermen on the alteration of the duration of ban was obtained. Opinion index values regarding the fishing ban as perceived by the four respondent groups is presented in Table 5.

Scientists strongly opine that fishing ban aids in fish recruitment and resultant fish catch ( $89.33 \pm 0.51$ ) followed by motorised ( $87.56 \pm 0.57$ ) and traditional sector ( $81.33 \pm 0.58$ ). While artisanal

**Table 3: Employment and labour income loss in fishing in Pudhukottai district**

Category	No. of units	No. of fishing days	Average crew size	Income loss per day per labourer (Rs)	Total employment loss (in man days)	Total loss in labour income (Rs.lakhs)
Mechanised crafts	391	19	6	600	44,574	267
Motorised crafts	778	26	7	400	1,41,596	566
Total	1169				1,86,170	833

Source: Primary data

**Table 4: Employment and labour income loss in fishing in Ramanathapuram district**

Category	No. of units	No. of fishing days	Average crew size	Income loss per day per labourer (Rs)	Total employment loss (in man days)	Total loss in labour income (Rs.lakhs)
Mechanised crafts	1705	19	6	600	1,94,370	1166
Motorised crafts	2711	26	7	400	4,93,402	1974
Total	4416				6,87,772	3140

fishermen (both traditional and motorised) and scientists stand for the fishing ban, mechanised sector stand against the same as indicated by the lowest index ( $54.22 \pm 0.69$ ). Similarly, opinion index for the alteration in the period of ban was the highest among scientists ( $97.33 \pm 0.35$ ) followed by motorized sector ( $81.78 \pm 0.96$ ) thus strongly recommending the increase in the duration of fishing ban similar to the technical report of DAHD&F, GOI. While mechanised sector strongly resist this statement, traditional fishermen remain neutral as they are unaffected by the fishing ban.

Scientists displayed high opinion index ( $89.33 \pm 0.82$ ) regarding the implementation of ban in two terms. Mechanised sector second the scientists in this regard ( $68.89 \pm 1.05$ ) and voiced out that the ban could be in two terms, particularly in May and December. During the monsoon period, the fishing activity is all the more suspended due to the rough weather conditions. In contrast, the mechanised sector showed least opinion index ( $47.11 \pm 0.85$ ) for the implementation of uniform ban along East and West coast of India. Presently, as East and West coast of India follows separate ban period, the labourers in mechanised sector migrate to the neighbouring states for seasonal employment. This would be impossible, when uniform ban is observed resulting in seasonal unemployment throughout the ban period.

#### Constraint analysis of Mechanized labourers towards fishing ban

The constraints of fishermen during the fishing ban period (Table 6) were documented based on the Garrett score. Poverty was observed to be the major problem during the ban period. Following which, lack of Government support and unemployment were the subsequent subjects of concern.

Similar findings have been reported with unemployment as the most important problem encountered by the trawl labourers during the ban period<sup>11</sup>. This was the case with Versova fishing village in Maharashtra. It was also found that the trawl labourers were not satisfied with the ban relief amount provided by the Government of Tamil Nadu (i.e. Rs. 2000 per family) and that it should be enhanced to Rs. 9000 (@ Rs. 200 \* 45 days) in order to support their livelihood. It is noteworthy to mention that the ban relief assistance given by the Government of Tamil Nadu is usually disbursed after the ban period which defeats the very purpose of providing the relief. The respondents voiced out that the ban relief amount needs to be expended at the right time as their socio economic position is literally worse during the ban.

Given that fishing is the primary and lone source of living for these labourers, alternate work opportunities during the ban period, is the need of the hour, to protect the subsistence and living of mechanized workers. Some of these workers have reported to migrate to kerela during the

**Table 5: Opinion Index of fishermen and scientists regarding the fishing ban**

Statements	Opinion Index (Mean $\pm$ S.D)			
	Traditional	Motorised	Mechanised	Scientist
Fishing ban increases fish catch	$81.33 \pm 0.58$	$87.56 \pm 0.57$	$54.22 \pm 0.69$	$89.33 \pm 0.51$
Alteration in the period of fishing ban	$65.33 \pm 1.00$	$81.78 \pm 0.96$	$47.11 \pm 0.77$	$97.33 \pm 0.35$
Ban should be implemented in two terms / seasons	$56.67 \pm 0.86$	$58.67 \pm 0.80$	$68.89 \pm 1.05$	$89.33 \pm 0.82$
Uniform fishing ban period across East and West coast of India	$50.00 \pm 0.72$	$48.44 \pm 0.65$	$47.11 \pm 0.85$	$54.67 \pm 0.70$
Fishing ban period subsidy is sufficient	$56.00 \pm 0.71$	$52.89 \pm 0.74$	$46.67 \pm 0.63$	--

**Table 6: Trawl labourers' opinion on constraints during fishing ban period**

S. No.	Constraints	Mean % score	Garrett score	Rank
1	Poverty	22.96	65	1
2	Lack of Govt support	32.65	59	2
3	Unemployment	38.27	56	3
4	Low wages	48.98	51	4
5	Lack of credit	61.22	44	5
6	Lack of trawl owner's support	72.45	38	6
7	Seasonal employment	73.47	37	7

Source: Primary data

ban period for seasonal employment. Of late, the same has become hard-hitting, as too many of them flood to the neighboring state for livelihood.

Hence it is recommended to generate alternate employment within the state through community based arrangements, either in traditional fishing vessels or in the fishing allied sectors i.e., in fish processing, repairs and maintenance of fishing accessories to ease the perplex situation. Fishing ban has been one of the very few effective regulatory measures in place. Only when these socio economic issues are sought, there are further chances of improvement of the existing trawl ban.

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#### REFERENCES

1. Fisheries Policy Note. Department of Animal husbandry, Dairying and Fisheries, Ministry of Fisheries, Government of TamilNadu (2015-16).
2. Ammini, P.L. Status of marine fisheries in Kerala with reference to ban on monsoon trawling. *Mar.Fish.Infor.Serv.,T&E Ser.*, **160**: 24-36: (1999).
3. Vivekanandan, E., Narayanakumar,R., Najmudeen, T.M.,Jayasankar, J., and Ramachandran, C. Marine Fisheries Policy Brief-2, Seasonal fishing ban, *CMFRI Special Publication*, **103**: 01-44: (2010).
4. Salim, S. S., HenaVijayan and Sandhya, K. M. Trade-off between monsoon trawl ban and the livelihood of trawl labourers in Maharashtra. *Indian J. Fish.*, **57**(2): 67-71: (2010).
5. Aswathy, N and Sathiadhas, R. A socioeconomic impact assessment of monsoon trawl ban on marine fisheries sector of Kerala State. In:B.MadhusoodanaKurup and Ravindran, K. (Eds) *Sustain fish, Proceedings of the international symposium on improved sustainability of fish production systems and appropriate technologies for utilization* Cochin University of Science and Technology, 781-792: (2006).
6. Balasubramaniam, S., Pravin, P.,Sreevalsan,J.M.,Brajmohan and Singh, D.P. Adoption of improved practices and annual fish catches among mechanized boat owners. *Fish. Technol.***37**(2): 137-143: (2000).
7. Ponnusamy, K., Jayanthi, M., Kumaran,M., and Thenmathi, N. Influence of socio-economic profile of shrimp farmers on the extent of adoption of shrimp culture technologies. *Fish. Technol.***42**(2): 226: (2004).
8. Garret, H.E., and Woodworth, R.S. Statistics in psychology and education, Vakils, Feffer and Simons Pvt. Ltd., Bombay, India, 329: (1969).
9. Aswathy, N., Shanmugam, T. R., and Sathiadhas,R. Economic viability of mechanized fishing units and socio-economics of fishing ban in Kerala. *Indian J. Fish.*, **58**(2): 115-120: (2011).
10. Sampath, V. India – National Report on the Status and Development Potential of the

- Coastal and Marine Environment of the East Coast of India and its Living Resources. GEF PDF Block B Phase of FAO/BOBLME Programme, November 2003. 295: (2003).
11. Shyam S. Salim. Monsoon Trawl ban and its effects on the livelihood of trawl labourers: The case with Versova fishing village in Maharashtra, *Journal of Indian Fish Association*, 34: 115-122: (2007).