Empowerment of Fishermen of Chilika Lagoon, Odisha: A NETFISH- CDA Joint Venture.

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Focal Points at a Glance: *There has been a significant increase in the incomes and living conditions of fishers of Chilika lake in Odisha. The authors, presenting the details in this repsect, tell us that a significant development in this regard has become possible because of initiatives like those taken by MPEDA / NETFISH for promoting the fishery development and sustainable utilisation of fish produced from the lake.*

Abstract

The Chilika Lagoon in Odisha is considered to be one of the major fishery resources in India providing livelihood to about 2 lakh fishermen. Majority of fishermen population in Chilika belong to an economically backward class. To improve the socio-economic condition of the fishers and to encourage sustainable fishery in Chilika, NETFISH-MPEDA and CDA jointly launched a campaign encompassing a series of capacity building training programmes and distribution of highly efficient Insulated Fish Boxes (IFBs) among the fishers concerned. A study was carried out to assess the outcome of the training programmes and usage of IFBs on the socio-economic condition of Chilika fishers. Data was collected by conducting a survey in which direct interview was carried out among fishers using questionnaires. Secondary information was collected from profit and loss records maintained at Primary Fishermen Cooperative Societies (PFCSs) around Chilika Lake. The study indicates that the fishermen were much benefited by the training programmes and usage of IFBs. Regular use of IFBs and application of proper post-harvest quality management techniques have resulted in 33.65% price hike for their catch. Fishermen are now getting more of returns for their efforts, while consumers have the luxury of enjoying good quality sea food.

Introduction

The Chilika lagoon is considered to be the largest brackishwater lagoon in Asia. It is situated on the east coast of India, in Odisha, and lies between latitudes 19° 28' and 19° 54' N. and longitudes 85° 67' and 85° 35' E. The lake has a waterspread area which varies from about 900 km² in summer to 1200 km² in monsoon. The lagoon is the second largest in the world and is a unique assemblage of marine, brackish and freshwater eco-systems. Chilika has been designated as a Wetland of International importance (IUCN), especially as Habitat for water birds under the Ramsar Convention (Iran, 1981). Chilika is one of the largest wintering grounds for migratory birds and is inhabited by some of the rare, vulnerable and endangered species. It is one of the hotspots of biodiversity in the country. A total of 225 fish species adapted to marine, brackish and freshwater habitat has been reported from the lagoon. The fish fauna is predominantly marine in composition and it gets continuously restocked from the sea through a channel which serves as a highway for the to and fro movements of the fish.

The Lake, a highly productive ecosystem, is a main source of capture fishery resource of Odisha. The fisheries output shares more than 70% of Chilika's economic value. The fish catch composition of Chilika includes fish (65%), shrimp (33%) and crab (2%). Fisheries contribute to 2.4% of the GDP of Odisha and thereby play an important role in the economy of the State (Mohanty and Nayak, 2012). Much of the State fisheries is dependent on the Chilika which provides livelihood to about 2,00,000 fishermen living in 141 villages located in the vicinity of the lagoon. In Odisha the fishing activities are mainly concentrated in and around Chilika (Nayak *et al.*, 2008). Data from studies on socio-economic conditions of fishing communities form a good base for framing proper policies and plans for economically backward communities (Sharma and Bose, 2008). Fishermen of Odisha are not able to fully exploit the fishery potential of the State and are lagging behind in fishery export (Nayak and Mishra, 2008). Since the traditional fishers depend on the limited natural resources of the lagoon, their livelihood is quite vulnerable to the negative impacts to the lake resulting from anthropogenic activities and natural calamities. Therefore it is an important issue to improve and stabilise the livelihood of people in extreme poverty around the lagoon.

With an aim to improving the socio-economic conditions of fisherfolk of Chilika and to ensure sustainable fishing practice in the lake, Network for Fish Quality Management and Sustainable Fishing (NETFISH) and Chilika Development Authority (CDA) launched a joint venture to provide capacity building training to the fisher members of Primary Fisherman Cooperative Societies (PFCSs) in Chilika Lake. The role of Primary Fishermen Co-operative Societies (PFCSs) in Chilika is to prevent exploitation of fishers by the middlemen and money lenders and to allow fishers

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Fig.1. Topography of Chilika Lagoon, Odisha

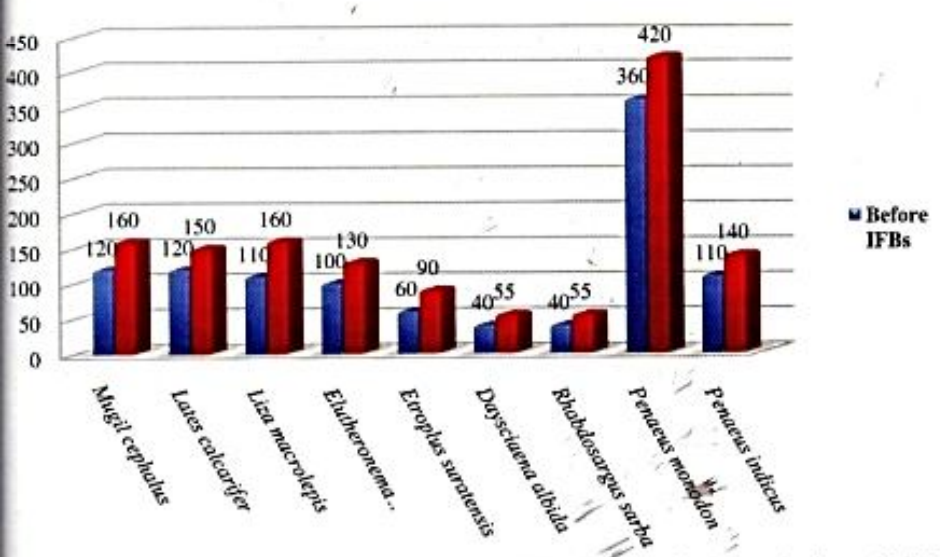

Fig 5: Fishermen demonstrating quality and freshness of fish caught from Chilika and transported in IFBs

to market their catches through the PFCSs. These PFCSs have been the symbol of community-led management of the fisheries of Chilika for decades. Presently, there are 118 nos. of Primary Fishermen Co-operative Societies (PFCSs) operating in Chilika Lake with 37,194 members, of whom 29,293 are male and 7,901 female members. The NETFISH-CDA joint programme also included distribution of MPEDA (Marine Products Export Development Authority) - subsidised Insulated Fish Boxes (IFBs) to the fisherfolk of Chilika. In the present study the outcome of training programmes and IFBs on the selling price of fish caught by Chilika fishers was assessed by conducting surveys.

Background Information on NETFISH-CDA Joint Venture

NETFISH (MPEDA) and CDA jointly initiated the capacity building training for the local fishers in the year 2010 with an objective to endorse conservation and sustainable exploitation of natural resources of the Chilika. NETFISH-CDA

Fig 2: Fishermen exhibiting NETFISH banner and cleaning solutions provided to them during the training

Fig 3: Insulated Fish Box designed exclusively for fishers of Chilika

Fig 4: Fishermen demonstrating quality and freshness of fish caught from Chilika and transported in IFBs

joint venture in Chilika operates by conducting intensive extension training programmes for fishers in the lagoon with the support of Odisha State Fisheries Department. The main agenda of the programme is to offer capacity building training to the fisher members of Primary Fishermen Cooperative Societies (PFCSs) in Chilika Lake on sustainable management of fishery resources and promotion of responsible fisheries which is continuing very successfully. A syllabus on fish quality management and sustainable fishery was prepared for the smooth conduct of the training programmes. The training programmes are being conducted on a regular basis at the PFCSs level in different fishing villages with the help of nine local NGOs.

As on June 2013, a total of 222 training camps in 88 fishermen villages covering

84 PFCSs have been conducted, benefiting 6,660 fishers who were imparted training on various aspects of responsible/ sustainable fisheries, post-harvest fish quality management practices. OMFR Act in Chilika is for regulatory fishing and gear size restrictions and governance of PFCS. They were also given proper training on the use of high performance insulated fish boxes as a tool for fetching higher prices for their catch. The fishers are encouraged and told to strictly follow ban on aquaculture in Chilika under coastal Aquaculture Authority Act, 2005. As a part of the programmes, awareness on various centrally sponsored fishermen welfare schemes and Insurance to fishermen was imparted to Chilika fishers. Fisherfolks were also updated on the present status of the stock of target species as an attempt to encourage fisherfolk's self-efforts in endorsing responsible fisheries.

To promote sustainable fisheries in Chilika, post-harvest fish quality management has to be given prime importance as it would help to maintain high quality, prevent loss due to spoilage and fetch higher price for the catches. For serving the purpose, highly efficient Insulated Fish Boxes (IFBs) were provided to fisher members of Chilika PFCSs who own fishing boats having valid registration licenses. To the fishers of Chilika, 4768 IFBs were distributed through subsidy assistance scheme of MPEDA. The distribution of IFBs was carried out by organising village level distribution camps under the concerned PFCSs.

Methodology

A field survey was conducted among the fisher members of PFCSs of the Chilika lagoon. The study was conducted in PFCSs of Jayantipur, Karimpur, Bhusandpur, Nairi, Kumandala, Baghalanzi, Sorana and Hatabaradi. The villages, PFCSs and fisher members were randomly selected. The sample size was 200 comprising 25 respondents from each of 8 selected PFCSs. The questionnaire for the survey was designed to assess the extent to which IFBs and the training programmes were successful in improving the socio-economic conditions of fishing communities of the Chilika lake. The data were collected through personal interviews. The data on difference in selling price of nine economically important fish commodities (*Mugil cephalus, Lates calcarifer, Liza macrolepis, Elutheronema tetradactylum, Etroplus suratensis, Daysciaena albida, Rhabdosargus sarba , Penaeus monodon* and *P.indicus*) before and after the use of IFBs were collected by referring to the daily and monthly profit and loss record maintained at each of the PFCSs. Data thus collected were analysed using appropriate statistical techniques. We had two sets of data for the selling price of economically important fish commodities, ie., before the introduction of IFBs and after using IFBs. The statistical significance of increase in average selling price of fish commodities after the use of IFBs was analysed using paired "*t*" test.

Results and Discussion

The Chilika is a pear shaped lagoon located on the east coast of India (Fig.1.). The lake is a vital source of livelihood for more than two lakhs of fisherfolk living around its vicinity (Ghosh, 2003). To improve their socio-economic conditions, NETFISH and CDA jointly organised capacity building training programme and initiated the distribution of Insulated Fish Boxes through MPEDA subsidy scheme (Fig.2 and 3.). The impact of these programmes on the livelihood of Chilika fishermen was assessed through a survey. The outcome of the survey was quite encouraging as the feedback from fishermen was positive. Fishermen found IFBs to be very useful as their use helped them to improve the shelf life and maintain quality of caught fish which fetched them higher price. Before they had the provision of IFBs, they used to keep the catch on Boat deck, bamboo baskets, plastic bags, plastic drums, plastic crates or in thermocool boxes which were not efficient in maintain the quality of the fish. Moreover, the wastage of ice was far more in these containers in comparison to IFBs. Before their using of IFBs, the fishermen were always in a hurry to sell their catch at the earliest because of the deteriorating quality of the fish and they were being forced to sell their catch at low price. In the feedback, fishermen have confirmed that the use of IFBs has given them more time to fish in Chilika and to bargain the best price for their catch (Fig.4). IFBs preserved the quality of fish for a longer duration and the fresh looking fish attracted more of traders which further helped to improve the price. Other positives marked out by fishermen include ease of cleaning the utensil and reduced peeling time.

The fishermen also gave positive feedback for the capacity building training programme conducted jointly by NETFISH-CDA. According to them, the programme had generated awareness on fish quality among them. Earlier they used to give very little importance to post-harvest handling of fish but now that they are aware of the impact of poor post-harvest handling on the quality of fish, they are giving more of importance to it. They are now more conscious while handling the fish and routinely employ the practices they have learned from training programmes on fish quality management. The fishermen are of the view that the training programmes and IFBs not only improved their economic conditions but have also uplifted their motivation level for fishing as they are now earning deserving dividends for their efforts.

The Chilika fishermen have been selling their catches to the money lenders-cum-private fish merchants at a price below the average prevailing price at landing centres as they have very little time to bargain the price level due to the rapidly deteriorating fish quality. Keeping their catches on board for considerably longer time without practising proper post-harvest fish quality management

Table.1. Percentage hike in selling price of nine economically important fish commodities (per kilogram) after the use of Insulated Fish Boxes.

Sl. No.	Fish Commodity	Percentage Gain in Selling Price After Using IFBs
01	*Mugil cephalus* (Flathead mullet)	33.33
02	*Liza macrolepis* (Large scale mullet)	25.00
03	*Lates calcarifer* (Seabass)	45.45
04	*Elutheronema tetradactylum* (Fourfinger threadfin)	30.00
05	*Etroplus suratensis* (Green chromide)	50.00
06	*Daysciaena albida* (Bengal corvina)	37.50
07	*Rhabdosargus sarba* (Gold lined sea bream)	37.50
08	*Penaeus monodon* (Giant tiger prawn)	16.67
09	*P.indicus* (Indian white prawn)	27.27
	Average	**33.65**

measures such as immediate icing in hygienic condition were identified to be the main reason for rapid deterioration of fish quality. The introduction of IFBs and proper training in post-harvest fish quality management brought about a significant change in the above said scenario. By analysing the daily and monthly profit and loss account (maintained at PFCSs) of nine economically important fish commodities it can be concluded that the fishermen are now getting, on an average, 30-35% increased returns from sale of fish brought in IFBs in comparison to the returns they were getting before, without using IFBs (Table.1and Fig.5). Out of the nine fish commodities considered for the study, maximum difference in selling price was observed in respect of *Etroplus suratensis* (Green chromide). The use of IFBs resulted in 50% increase in selling price of *Etroplus suratensis*, while inthe case of *Lates calcarifer* an increase of 45% in the selling price occupied the second position. Other finfish species showed an increase of 30 to 37.5% increase in selling price, while in the case of shellfishes an increase of 16.67% and 27.27% was observed, (in the selling price of *Penaeus monodon* and *Penaeus indicus* respectively). Data on differences in the selling prices of fishes before and after the use of IFBs were analysed by paired't'-test at 95% confidence interval and the results indicated a statistically significant (P = 0.0001) hike in the selling price of fishes after the employment of IFBs. Marked improvement in selling price of finfishes and shellfishes encouraged the fishermen members of PFCSs around Chilika to regularly use IFBs and they are now much convinced of beneficial impact of post-harvest quality management.

Conclusion

The post-harvest quality management training programmes and the supply of IFBs to the members of Primary Fishermen Cooperative Societies in Chilika Lake area helped the fishers to maintain high standards of the quality of their catch for a longer duration. There has been tremendous interest generation among the fishers to buy IFBs under MPEDA subsidy scheme. The results of survey have clearly established that the fishers are getting an average increased return of 33.65 % for their catches by using IFBs. Determined efforts through effective capacity building training, demonstration, monitoring and evaluation are required to bring about a paradigm shift in post-harvest fish management practices and perception of traditional fishers. The initiative taken in this respect is a good beginning and it will go a long way in bringing happiness to fisher communities of the second largest brackishwater lagoon of the globe.

Reference

MOHANTY, A.K., NAYAK, L. 2012. Fishermen of Samala Village of Chilika Lagoon, Orissa. There Socio-economic condition. *Fishing Chimes* 32(4): 38-43.

NAYAK, L., MOHAPATRA R., SWAIN D. 2008. Socioeconomic condition of fisherman of Mainsha of Chilika lagoon, Orissa. Eco-chronicle. 3(3), 215-220.

NAYAK, L., MISHRA, A.K. 2008. Socioeconomic condition of fishermen and its effect on environment: A case study of Ganjam district, Orissa. Nature Environment and Pollution Technology. 7(1), 111-116.

SHARMA, P.V. and BOSE, K.S. 2008. Socioeconomic determinance of mechanised fishing boat operators, A case study of Vishakapatnam coast. *Fishing Chimes*. 27, 66-67.

GHOSH, A. 2003. Experience brief of Chilika lake Orissa, India. Centre for Environment and Development. 1-35.