



Fisheries Management in Stanley Reservoir - A Case Analysis

S. Agnes Daney Angela*, Sheela Immanuel, P. S. Ananthan, G. Ajay Anand and M. Krishnan
Central Institute of Fisheries Education, Versova, Mumbai - 400 061, India

Abstract

Fisheries in reservoirs, play a significant role in the livelihood of rural communities. In this context, a study was undertaken in Stanley reservoir in Salem district of Tamil Nadu to understand management of fisheries in the largest reservoir in South India. An attempt was made to comprehend the problems encountered by the fishers. The Department of Fisheries takes lead role in the management of the reservoir. Rules and regulations are framed by the Department of Fisheries including annual stocking of fish seeds. Fishing in the Stanley reservoir is carried out by licensed fishers whose numbers are regulated by the Department of Fisheries. It was observed that mesh size regulations and closed seasons are not enforced strictly. Fishers need to sell the catch to the Fishermen Co-operative Marketing Society which gives them reasonable price. The major constraints perceived by the fishers were 'fluctuating income' and 'poaching'.

Keywords: Stanley reservoir, fisheries management, licensed fishers

Introduction

Fisheries form an important source of food, occupation and recreation for people around the world. It has been recognized as the source of livelihood for a larger section of economically backward population of the country. The total Indian fish production during the year 2011-12 was 8.67 mt, with a contribution of 5.30 mt from inland sector (DAHDF, 2013). The large network of inland waters in India provides great potential for capture

fisheries. Reservoir is the single largest inland aquatic resource in India, in terms of resources and production potential. Even though reservoirs form an important source of fish, its potential has not yet been fully exploited. Sugunan (1995) suggested that unlike the rivers, which are under the increasing threat of environmental degradation, the reservoirs offer ample scope for fish yield through adoption of suitable management norms. Any attempt to increase productivity in inland fisheries has to rely heavily on the reservoirs.

Of the total area of 29 07 000 ha under reservoirs in India, 5 70 000 ha are in Tamil Nadu (DAHDF, 2013). Therefore reservoirs can play a major role in the fisheries development in the state. The fishery resources of most of the reservoirs in Tamil Nadu are under the control of the Department of Fisheries and a few are under the Tamil Nadu Fisheries Development Corporation Limited (TNFDC). There are three methods by which the fishery resources of reservoirs are being harvested *viz.*, licensing system, shared fishing system and leasing system. The fishery resources of Stanley reservoir is under the control of Department of Fisheries and is being harvested by licensing system. For the proper and efficient management of the fishery resources of the reservoir, it is essential to study the existing management regimes of the reservoirs and understand the problems and difficulties of the fishers so that feasible solutions could be provided. This study aims to understand the fisheries management methods in vogue and the problems faced by the fishers of the Stanley reservoir which can be helpful for providing solutions to their problems and enhancing management and thereby sustaining their livelihood.

Materials and Methods

The study was conducted during the year 2010-2011 in the Stanley reservoir situated in Mettur taluk of Salem district in Tamil Nadu. Two villages namely

Received 01 March 2013; Revised 17 November 2013; Accepted 10 January 2014

* E-mail: agnesdanyangela@gmail.com

Keeraikaranoor and Kunandiyoor were selected from Meicheri and three villages namely Kottaiyoor, Kulaveeranpatty and Madaiyankuttai were selected from Kolathur. There are 2000 licensed fishers in the Stanley reservoir inhabiting in 40 villages around the reservoir. The first three villages namely Keeraikaranoor, Kunandiyoor and Kottaiyoor were selected based on the population of fishermen and the other two villages were selected as it had more traditional fishermen who were involved in fishing for generations. Purposive sampling method was adopted to select the villages. Thirty respondents were selected at random from each village, thus the total respondents selected were 150. A well structured and pre-tested interview schedule was used to collect data from the respondents. Focused group discussions were held to collect data regarding the fisheries management from the officials of the State Department of Fisheries and the secretary of the Fishermen Co-operative Marketing Society. Secondary data were collected from the published documents of the Department of Fisheries. Percentage analysis was done to make simple comparisons wherever necessary. 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 (Paulpandi, 2000).

Results and Discussion

Fisheries department has a Chinese carp hatchery and seeds of Indian major carps are produced in the hatchery. Since, the seeds produced are insufficient for stocking in the Stanley reservoir of 15 346 ha water spread area, the seeds are also purchased from private farms. The seeds are stocked every year during the months of August and September. Though stocking in the reservoir was known to be done regularly in the past, the stocking was inadequate and also the stocking size was not regulated for the past few years. The entire cost of stocking is borne by the Department of Fisheries. The number of seeds stocked in the reservoir annually were 25 00 000 and the size of seed stocked was 5 cm. Based on the recommendations of the National Fisheries Development Board (NFDB), presently the fish seeds are stocked at the fingerling stage (10 cm) at the rate of 500-600 ha⁻¹ (90 lakhs) for improved survival rate, protection from predators and for faster growth rate. Seeds of *Puntius* spp., *Cirrhinus* spp. and *Labeo* spp. collected from the river Cauvery were extensively stocked along with

euryhaline species such as *Etroplus suratensis* and *Chanos chanos* prior to the development of hatchery.

Coracle (*Parisal* in Tamil) is the only type of craft used by the fishers of Stanley reservoir. It is a saucer shaped country craft made of split bamboo mat covered with polythene sheet and coated with tar. The coracle is between 9.5 to 10.5 feet in diameter. The cost of a coracle is Rs. 3 000/- and the life span is one year. Fibre coracles are also available but are still not popular among the fishers because of its high cost. The fishers purchase the craft individually without any financial assistance from Co-operative society or Department of Fisheries.

Entangling type gill nets are the most common fishing gear. Drag nets and cast nets were also used by few fishermen. The Rangoon net (floating gill net) was introduced from Andhra Pradesh. Another type of gill net used in the shallow areas of the reservoir is *udu valai*, a bottom set gill net. Nylon monofilament gill nets of 90 mm to 310 mm mesh size are used to catch different species of fish. Hook and lines, drag nets, cast nets and *udu valai* are used for catching catfishes like *Mystus* sp and *Wallago attu*. The presence of underwater obstacles restricts the use of active gears. The quantity of the nets possessed varies from fishers to fishers. Some fishers have traps made of bamboo to catch murels which fetch high price.

The fishery in the Stanley reservoir is carried out by licensed fishers whose numbers are regulated by the Department of Fisheries. 'Limited entry' policy was continued with 227 coracles in 1956-57. In subsequent years about 350 coracle units were licensed until 1973-74 and it was increased to 1000 by 1991-92. Stanley reservoir was very productive in its early years with adequate infrastructural facilities such as a seed farm, ice plant, cold storage and regulated entry into the fishery. However once entry restrictions were removed and closed fishing seasons no longer enforced, the yield of fish from the reservoir declined (Sreenivasan, 1998). At present, there are 2001 licensed fishers. A licensee is charged with an initial license fee of Rs. 1750 and the license has to be renewed annually with a fee of Rs. 250.

The Department of Fisheries has recommended certain rules and regulations for the fishers for management purposes *viz.*, gill nets of mesh size less than 80 mm should not be used for fishing, the catch should be handed over to the Fishermen Co-operative Marketing Society, license should be

renewed at the appropriate time, ban on juvenile and brooder fishing and restriction of fishing within 200 m from the walls of the dam.

But there are certain practical difficulties to the fishers because of which they often fail to follow these regulations every time, though they renew license regularly. From the fishers' perspective, it is difficult to follow the mesh size regulation throughout the year as different mesh sizes are required according to the seasonal availability of target species. The mandatory closed season is enforced to a certain extent.

It was reported by Velayudhan (1999) that fisheries co-operatives have miserably failed to intervene in fish marketing and to ensure better consumer price to fishermen. The failure is considered to be one of the main reasons for the low income of fishermen. In the reservoir, the fishes are collected from different landing centers in truck carrying ice and brought to the society. After local sales, the fishes are sent to the retail markets in the society's trucks. Majority of the catch is then handed over to the highest bidder of the contract which is signed every year. The contractor then decides upon the sale of fishes. Usually, the fishes are gutted, iced and packed in thermocole baskets and sent to Kerala and Kolkata through rail transport. The total quantity of fish procured during the year 2008-09 was 246.801 t.

The Cumulative Perception Indices (CPI) on the constraints perceived by the fishers are given in Fig.1. The most important constraint from the fishers' perspective was the 'fluctuating income' (CPI: 2.51). The fluctuation in income is the result of fluctuation in catch. The catch return depends on several factors such as season, level of water in the reservoir, survival rate and growth rate. The second major constraint according to the fishers was 'poaching' (CPI: 2.50). Poaching, in this context, can be defined as the illegal catching of fish by a person who does not possess the license issued by the Department of Fisheries or the one who has not renewed it. There are around 40 villages bordering the reservoir and hence poaching can be prevented only to a certain extent, inspite of the efforts by the department officials. They can be encouraged to apply for license to do fishing legally. Poaching is one of the major causes for underestimated production figures.

In recent times, the gears used in the reservoirs are made of PA monofilament which will break easily

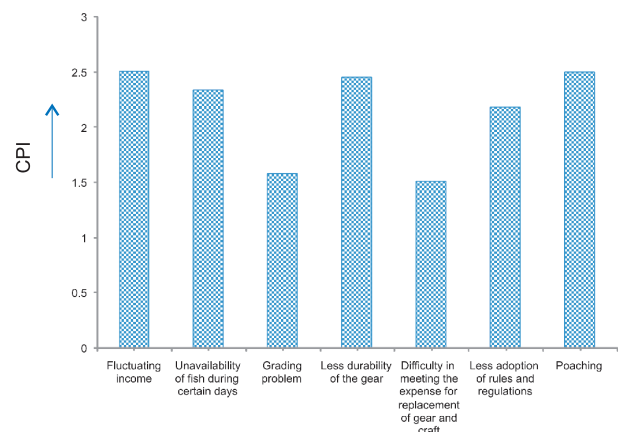


Fig. 1. Cumulative Perception Index for the constraints

when encountered with submerged obstacles. Once it is damaged, it cannot be repaired and should be replaced, unless it is a very small tear. Sometimes the gears are washed away with the force of the inflowing water. Heavy expenditure is incurred in fabrication of gears but its durability is highly unpredictable. 'Non-availability of fish during certain days' (CPI: 2.34) was the next most important constraint of the fishers. When the water level in the reservoir is either too high or low, the catch will be poor and the fishers remain unemployed. The fishers suggest that they should be given financial assistance during these days as it is given for marine capture fishers during the lean (closed) season. It is perceived that inland capture fishers should be treated at par with the marine capture fishers.

The next constraint is the 'less adoption of rules and regulations' (CPI: 2.18). In order to conserve the fishery resources of the reservoir, certain rules and regulations such as fishing at 200 m away from the walls of the dam, ban on using small meshed nets, ban on catching gravid fishes and fingerlings are framed by the Department of Fisheries. But, certain groups of licensed fishers and illegal fishers (poachers) failed to adopt the rules and regulations which lead to the depletion of the fishery resources. The small meshed nets used illegally to strain the fish seeds and fingerlings not only deplete the first grade seeds which are stocked but also the natural stock.

'Inappropriate grading' (grading based on size) (CPI: 1.58) was another constraint reported by fishers. The fishes caught are graded and then taken by the fishermen marketing cooperative society.

The fishes are graded according to a contract which is signed every year and the fishers are paid accordingly. Some of the fishers reported that the 'grade 1' fishes which fetch good prices are taken from them as 'grade 2' and sold to the contractors as 'grade 1'. These manipulative practices by middlemen should be curbed so that the fishers get the appropriate price for their catch. Wasim (2007) stated the problems faced by inland fish farmers as undercounting, non-availability of preservation facilities, non-availability of credit at the right time and at the reasonable interest rates and the lack of extension services and training facilities. 'Difficulty in meeting the expenses for replacement of gear and craft' (CPI: 1.51) was reported as one of the constraints. As the fishers do not have enough savings, they find it difficult to spend money towards replacement of craft and gear. Awareness should be created among the fishers on the usefulness of saving, saving schemes available in government institutions, and the drawbacks of getting credit from moneylenders with high interests.

Management of a reservoir which is spread over several thousand hectares surrounded by around 40 villages is difficult with the limited staff strength in the Department of Fisheries. Hence the resource users should be made capable to regulate the fishing in the reservoir. They need to be given an important role in the decision making process with respect to conservation and management of the resources. According to the principles of co-management, the Government consults fishers before regulations are introduced (Pomeroy & Williams, 1994). All the

stakeholders should be seriously involved to bring effective solution to the problems faced by the fishers. The constraints faced by the fishers are to be considered before planning any developmental interventions in the reservoir. As inland fishers are the backbone of freshwater fisheries, greater attention is to be paid to their socio-economic conditions and necessary steps to be taken by the developmental agencies to improve the standard of living of the fishers. Proper training on harvest and post-harvest technologies by the state and central government organization can be imparted to the fishermen.

References

- DAHDF (2013) Annual Report 2012-13. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, New Delhi
- Paulpandi, S. (2000) Perception of Farmers about Different Types of Shrimp Feed. Unpub. M.F.Sc. Thesis, Central Institute of Fisheries Education, Mumbai
- Pomeroy, R. S. and Williams, M. J. (1994) Fisheries Co-management and Small-scale Fisheries: A Policy Brief. Co-management Fisheries Project, ICLARM, Penang
- Sreenivasan, A. (1998) Fifty Years of Reservoir Fisheries in Mettur Dam, India: Some Lessons, Naga, the ICLARM Quarterly, October to December, pp 4-7
- Sugunan, V. V. (1995) Reservoir Fisheries of India. FAO Fisheries Technical Paper No. 345. FAO, Rome
- Velayudhan, T. D. (1999) Issues in fish marketing and scope for intervention by the local bodies. Fish. Chimes. 18 (11): 19-25
- Wasim, M. P. (2007) Issues, growth and instability of inland fish production in Sindh (Pakistan): spatial-temporal analysis. Pak. Econ. Soc. Rev. 25(2): 203-230