

Socio-economics of the Fish Marketing System at the Victoria Reservoir

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Abstract

The fishery of the Victoria reservoir is an open access resource where property rights are absent. Fifty four fishermen and thirty fish traders were subjected to a comprehensive analysis using semi-structured questionnaires to determine their social and economic attributes as well as their potential contribution towards effective management.

Fishermen have taken to this vocation secondarily and have no intrinsic fishing skills and could therefore directly destabilize the fishery by overexploitation. The progressive decline in fish catches since 1990 made some of the fishermen carry their fish stocks directly to the consumer since their catch was poor, while others gave up fishing altogether. In the absence of alternative sources of income, traders are compelled to purchase small fish which are available in large quantities.

A major portion of fish at the reservoir is disposed of through the fishermen to the trader and then to the consumer. Interviews conducted during the same period with consumers revealed that apart from the freshness of the fish, the socio-economic status of the consumer is a key factor which determines the type of fish purchased.

The fishery of this reservoir has an immense potential as a biological resource. A participatory management approach directly involving the fishing community is necessary to enhance fish production through effective implementation of fishery regulations.

Introduction

Sri Lanka, an island with no natural lakes has an ancient heritage of numerous shallow man-made water bodies built primarily for irrigating rice fields in the dry zone. Recently, some deeper reservoirs like the Victoria have been constructed in the highlands for hydro-power generation.

In recent times, increasing population pressure combined with the steady rise in market price of marine fish has made the sustainable utilization of fisheries in reservoirs important. The absence of a commercial riverine fishery with no tradition of aquaculture in the country further accentuates the need for sustainable fisheries development to augment the much needed protein supply for the people.

Apart from work of Chandrasiri (1986) who studied the socio-economic conditions of fishermen in five major reservoirs in the Hambantota district, Amarasinghe (1988) has investigated the socio-economic conditions of six fishing communities in four man-made reservoirs in the dry zone and Pet - Soede (1993) who has also studied the socio-economics of a community of reservoir fishermen in the dry zone, information pertaining to socio-economic attributes of inland fishermen in Sri Lanka is scarce.

A steep decline in annual fish production has been recorded in the Victoria reservoir since 1990 (Nathanael & Silva 1997). As such, this study focuses on determining the social and economic conditions of fishermen and traders in the Victoria reservoir and their potential contribution towards effective management. It also examines the existing marketing channels and associated problems in order to evaluate the scope that exists for enhancing fish production.

Materials and Methods

Socio-economic data for this investigation was collected using semi-structured questionnaires. A random sample of fifty four fishermen and thirty fish traders operating in the reservoir were interviewed over a six month period in 1994 and data on their socio-demographic profile (i.e., age, religion, education level, average family size) were collected. Their awareness on the need for rational utilization of the fishery, their potential contribution towards management, the existing marketing system and associated problems were also investigated. Subsequently, relevant information was collected during the monthly meetings of the Fisheries Co-operative Society.

One hundred and fifty consumers who purchased freshwater fish and one hundred consumers who purchased sea fish at the Digana market were also interviewed using a comprehensive questionnaire during the same period. Investigations were made on their economic status, the peak marketing time and the purchasing frequency of freshwater and sea fish. The daily peak marketing times and purchasing frequency were estimated by interviewing customers and monitoring the number patronising the freshwater fish stall to purchase fish from 0600 h to 1800 h daily during a one week period.

Results and Discussion

Fishing officially commenced in this reservoir in 1989. Two categories of fishermen, namely registered members of the Fisheries Co-operative Society (organized fishermen) and the unorganized fishermen who are non-members and adopt illegal fishing practices operate in the reservoir. This criterion of categorization of fishermen as organized and unorganized was adopted from Chandrasiri (1986). The organized fishermen use fibre-glass canoes and gill nets, fish at night and return early morning. The unorganized fishermen fish mainly during the day time using wooden canoes and nets (cast nets and gill nets) below the permissible (84 mm) mesh size. After the withdrawal of state patronage in July 1990, the organized fishermen joined the unorganized fishermen in illegal fishing.

Different types of retail traders such as cycle and motor cycle vendors, slab holders, box carriers, and two wholesale dealers are involved in marketing the fish.

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Socio-economics of fishermen and traders

Neither the race nor the religion appear to have influenced the choice of fishing as a vocation in this reservoir, since there are an approximately equal proportion of the different ethnic and religious groups (Table 1) except for the Roman Catholics/Christians who form only a minority of the fishing community. The only form of religious inhibition was that Buddhists refrain from fishing on full moon days and Muslims on Fridays. Of the traders, the majority were Sinhala Buddhists (Table 1). This is in contrast to lagoon and marine fishing communities in Sri Lanka where the majority are Sinhala Roman Catholics (Munasinghe 1984).

The age distribution of fishermen and traders is given in Fig. 1. Eighty percent of the fishermen were between 21 and 45 years of age. In the marine and lagoon fisheries of Sri Lanka, about 75% of the crewmen were below 35 years of age while the reverse was true for craft owners (Munasinghe 1984). The requirement of physical fitness to work as a crewman and the lack of capital to purchase a craft during their youth are two factors which have been attributed for the observed age-wise distribution. On an average the family size was five and a family comprised of 2-10 members. These fishermen have been employed as estate workers, casual labourers or in various business enterprises prior to taking up fishing as a secondary occupation since 1989. Female employment is virtually absent as in the marine and lagoon fisheries (Munasinghe 1984), the only assistance rendered by the women being disentangling fish and debris from the nets, which could be very time consuming. Of the traders 85% were between 26 and 45 years of age while their family size was more or less similar to that of the fishermen.

The literacy level of the fishermen and traders is given in Table 2. 1. 85% of the fishermen had no school education due to economic difficulties. The majority had stopped schooling in the lower grades and 61% of the fishermen and 46.7% of the traders had only a primary (Grade 5-8) education. Only a low proportion had passed the G.C.E. (Ordinary Level) and no one had proceeded beyond Grade 12.

One of the primary incentives for people to take up fishing as a livelihood in the reservoir is the low capital investment required. Apart from gill-nets (approximately Rs.1,000 per piece) which need to be replaced periodically, there is very little expense involved, since the fibre-glass canoes have been supplied on a 90% subsidy through the co-operative society. On the other hand, 25% of the traders have invested more than Rs. 15,000 which included the cost of their transport vehicle, containers necessary for transporting fish such as wooden boxes, a pair of weighing scales and a sharp chopping knife.

The income derived from fishing fluctuated widely based on the drastic fluctuations in water level (annual drawdown varies between 30-60 m and lasts for 5-6 months). During the periods of acute drawdown only 15% of the total fishermen operated. During high water level the average daily income of fishermen could vary from Rs. 100 to Rs. 300. In 1994, due to the steep decline in fish yield, there were only about 10% full time fishermen. About 90% depended on supplementary sources of income such as casual labour and animal husbandry, while relatives abroad (particularly in the Middle East) were the mainstay of certain families.

During high water level, the itinerant cycle vendors sell 25-50 kg of fish daily. A kg of fish is purchased at Rs. 30-35 from fishermen at landing sites and sold at Rs. 50-60. Only 5% of the traders could operate during low water level. Others depended on supplementary sources of income similar to that of the fishermen. During such periods, slab

Table 1. Distribution of fishermen and traders according to ethnicity and religion.

	% Fishermen	% Traders
Race		
Sinhalese	37.94	53.30
Tamil	32.75	6.70
Muslim	29.31	40.00
Other	0.00	0.00
Religion		
Buddhist	32.94	51.57
Hindu	25.34	6.70
Muslim	29.31	40.00
Catholic/Christian	12.41	1.73

Table 2. The percentage literacy level of fishermen and traders at the Victoria reservoir.

Education level	% Fishermen	% Traders
No school education	1.85	0.00
Grade 2-4	22.22	33.30
Grade 5-8	61.11	46.70
Grade 9-12	14.81	20.00

holders purchase fish transported from distant areas such as Minneriya, Kala wewa, Kantale, and Soraborawewa at Rs. 60 per kg. The profit made by selling these fish, however, is only Rs. 10 per kg.

The Fisheries Co-operative Society of the reservoir was established in 1989. Although it has been active upto date, the main focus has been on holding monthly meetings and building up a savings scheme. Only a very weak attempt has been made at managing the fishery and now, of the 125 registered fishermen, only about 20-25 members attend the monthly meetings.

Management of the fishery

Although about 90% of the fishermen were aware of the dangers of growth overfishing and the need for rational utilization of the fishery, their main focus has been on maximising their income. The steep drop in fish catches since 1994 has made them realise, that past management where decisions were made by high ranking government officials, and enforced through a single fisheries inspector was ineffective. The fishermen interviewed, unanimously agreed that development of a participatory approach, whereby decisions regarding management could collectively be taken by the fishing community through the co-operative society would help to eliminate the main management problem in the reservoir, which is illegal fishing. It is the fishermen themselves who could abide by the fishery regulations and stop using small meshed (below 85 mm) nets.

On the other hand, imposing size restrictions on the purchase of fish was not possible since the traders interviewed were not willing to participate in management. There was ample demand for small fish and the traders themselves needed an income and were willing to purchase small fish if available.

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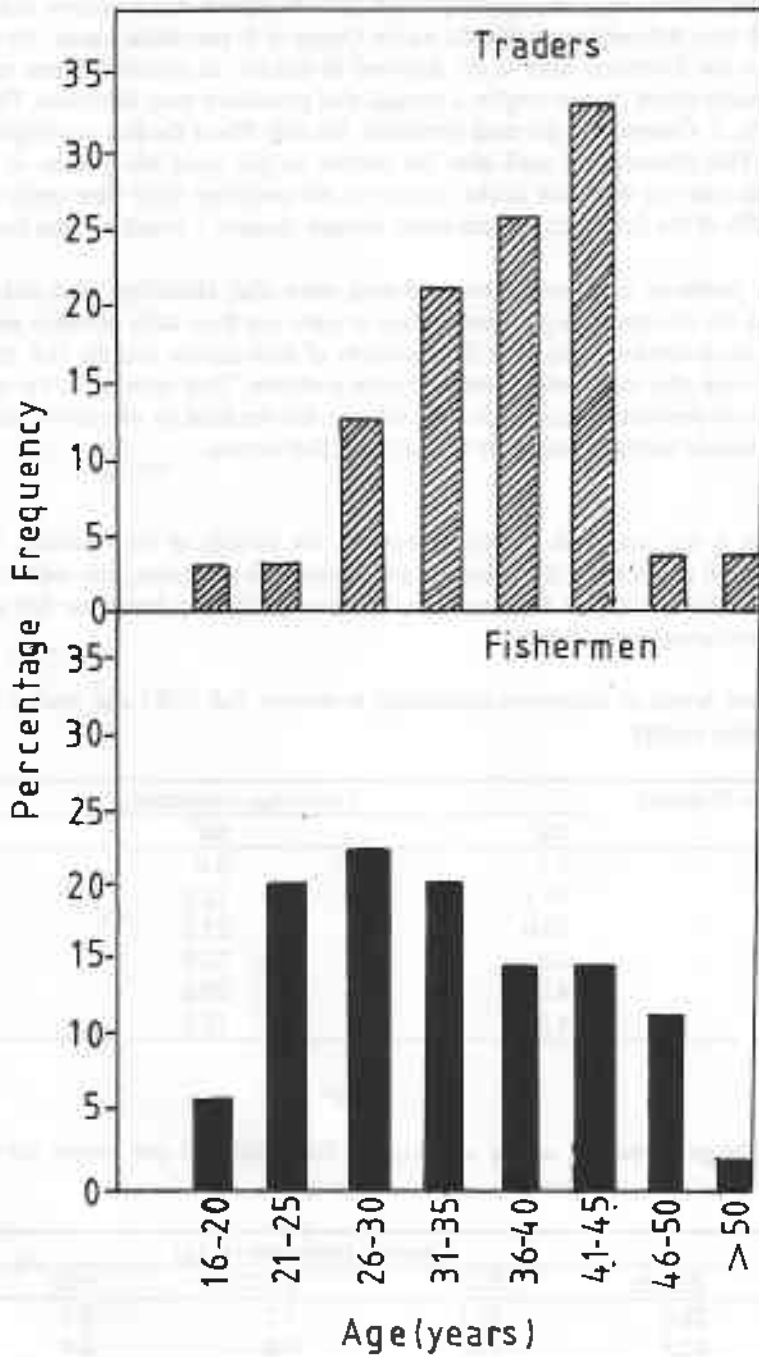


Fig. 1. The age distribution of fishermen and traders.

Marketing

In order to avoid unnecessary competition between traders, the fishermen in each fishing craft sell their fish only to a particular trader. Owing to its perishable nature, the fish purchased from the fishermen have to be disposed as quickly as possible. Three main marketing channels which do not involve a complicated procedure were identified. These are shown in Fig. 2. Channel 3 is the most profitable, but only 8% of the fish was disposed of through it. This channel was used after the decline in fish yield when some of the fishermen began carrying their fish stocks directly to the consumer since their catch was poor. About 52% of the fish catch was marketed through channel 1 which had the lowest profit.

Some problems associated with marketing were also identified. Slab holders pointed out that the absence of a permanent place to carry out their daily business was a problem while cycle vendors stated that the instability of their income and the lack of an organization to look after their welfare were the main problems. They stressed on the need for loan facilities to purchase and maintain their vehicles and the need for alternative means to relieve the financial hardship caused by the declining fish catches.

Consumers

Digana is the most well patronized town in the vicinity of the reservoir. The market itself is well organized with freshwater and marine fish stalls alongside each other so that it was possible to compare the income level of those purchasing freshwater fish with that of those purchasing marine fish.

Table 3. Income levels of consumers purchasing freshwater fish (FW) and marine fish (MF) at the Digana market

Monthly income (Rupees)	Percentage consumers	
	FW	MF
< 1,000	3.3	0.0
1,000-3,000	53.3	12.5
3,000-6,000	30.0	22.5
6,000-9,000	5.4	33.0
9,000-12,000	4.0	20.0
>12,000	4.0	12.0

Table 4. Percentage frequency of the quantity of fish purchased per month (n=150 consumers)

Fish Type	Quantity purchased (in kg)			
	0.25-5	5-15	15-25	>25
Freshwater	28.6	55.8	9.5	6.1
Marine	82.5	17.5	0.0	0.0

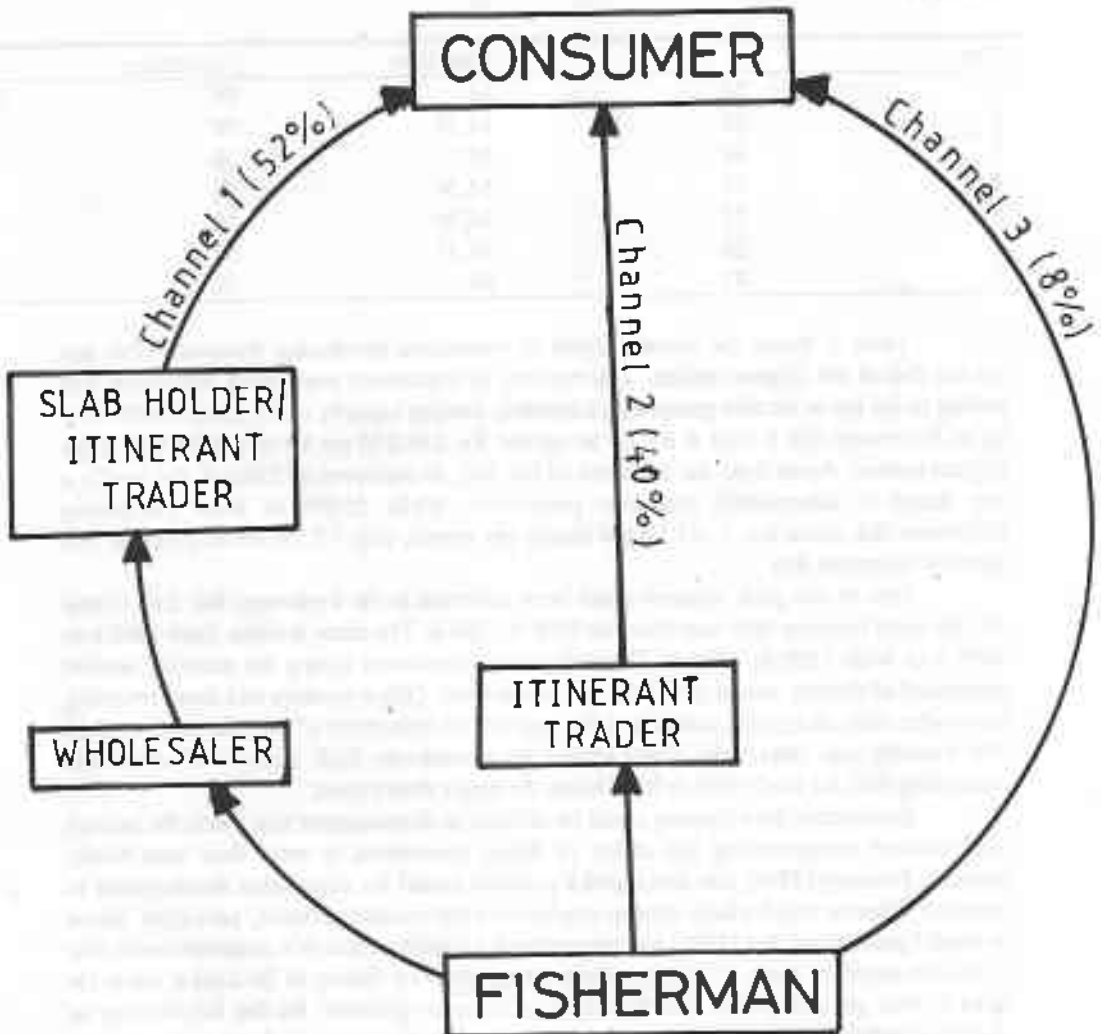


Fig. 2. Fish marketing channels in the reservoir.

Table 5. The total number of customers (n) patronising the freshwater fish stall at the Digana market and the percentage customer frequency during peak marketing time, during a one-week period (Observation time: 84 hrs; M 1000-1200 hrs; N 1400-1600 hrs; D 1600-1800hrs).

Day	n	Peak time	Percentage
1	30	M	86
2	24	M, D	58
3	36	M	56
4	32	M, N	77
5	22	M, N	50
6	26	M, D	62
7	37	M	70

Table 3 shows the income levels of consumers purchasing freshwater fish and marine fish at the Digana market. The majority of consumers purchasing freshwater fish belong to the lower income group with a monthly earning capacity of Rs. 2,000-3,000. One kg of freshwater fish is sold at Rs. 60 as against Rs. 120-250 per kg of marine fish at the Digana market. Apart from the freshness of the fish, as indicated in Table 4, the cost is a key factor in determining consumer preference. While 55.8% of those purchasing freshwater fish could buy 5 -15 kg per family per month, only 17.5% could purchase this quantity of marine fish.

One or two peak business times were observed in the freshwater fish stall (Table 5). One peak business time was between 1000 h-1200 h. The other is either from 1400 h to 1600 h or from 1600 to 1800 h. The majority of consumers during the morning session comprised of drivers, casual labourers and housewives, Office workers and those returning home after their daily work comprised the majority of consumers of the afternoon session. The monthly pay days were characterised by a markedly high number of consumers purchasing fish, the ready cash in hand being the major determinant.

Sustainable development could be defined as development that meets the present need without compromising the ability of future generations to meet their own needs. Recently Prompoj (1994) has developed a pyramid model for sustainable development of reservoir fisheries which places special emphasis on the social/community paradigm. Based on model predictions, Pet (1995) has recommended reinforcement of a minimum mesh size of 76 mm stretched mesh to conserve the existing reservoir fishery in Sri Lanka, while De Silva (1996) stresses on the fact that there is immense potential for the introduction of suitable scientific management strategies to increase fish production in Asian reservoirs.

High consumer demand coupled with the progressive decrease in fish catches in the Victoria reservoir has made it clear that successful implementation of fisheries management decisions is urgently needed for sustainable development. It is essential that the fishermen themselves identify management goals. With pragmatic support from the fishing community, implementation of a participatory management strategy through the Fisheries Co-operative Society would help to enhance fish production and marketing in the reservoir, as well as to uplift the income level and the socio-economic status of the fishermen and traders.

*Socio-economics of the fishery of a Sri Lankan reservoir***Acknowledgements**

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