

PROSPECTS AND CHALLENGES OF KATTUDEL FISHERY : AN ANCIENT FISHING TECHNIQUE IN SRI LANKA

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ABSTRACT

Kattudel or stake net fishery is an ancient (from early 1950s) lagoon fishing technique in many regions of Sri Lanka. It draws special attention due to the absence of open access nature. The fishery is regulated by kattudel association stemming from the Catholic Church. In fact, the fishery has its own distinguished features. Hence, this study attempts to highlight some prospects and challenges veiled around kattudel fishery in Western and North - Western provinces of Sri Lanka. Usually, the kattudel lay towards the sea, 30 _ 40 m distance from the estuary in the lagoon. The targeted species are prawns, crabs, and lobsters. The fishery is benefited by the government with fishing equipment and credits by means of a gazette announcement. Younger generation's hesitation to enter the fishery demarcates the major problem. At present, there's only 4-6% involve with this fishery. The lower level of supply does not suffice the existing demand, which brings slightly higher prices than for other fishers. Moreover, they do not experience any marketing problems. The marketing chain has been intervened by Ceylon fisheries corporation in order to motivate and to offer the best price. The SWOT analysis reveals a vivid picture about the potentiality of the fishery. The kattudel association plays the key role for the sustenance of the fishery, even though it meets numerous bottle necks for development. Moreover, the fishery demonstrates sustainable strategies that would be valuable lessons for other fisheries as well. In fact, kattudel fishery is a fishing technique, which is on the door step of extinction with golden management tips towards sustainability, showing a high potential to success.

Keywords: kattudel, kattudel association, SWOT analysis, sustainability

INTRODUCTION

Negombo Lagoon

Negombo lagoon situated in Gampaha district in western province of Sri Lanka, margined to north west coast (Fig 1). It located at $7^{\circ} 7' N$ and $79^{\circ} 5' E$. The total lagoon area is approximately 3,200 ha and it is said to be one of the most productive estuaries in Sri Lanka (Jayakody, 1994). The lagoon is enriched with two main rivers; Dandugam oya and Ja Ela. Muthurajawela marshy land is connected to the lagoon at its southern end. In fact, the lagoon bears enormous economical and ecological value. It provides spawning, nursing, feeding ground, and shelter for fish and shrimp species. The productivity of the lagoon is around 150 kg/ha/year (Jayakody, 1994). The fish stock of the lagoon is exploited by three categories of fishermen; the fishermen living around the lagoon, fishermen living in the Muthurajawela mash, and those who do fishing , but come to the lagoon during the South west monsoon months. There are 22 fishing methods practising in Negombo lagoon. Among them, 13 are entirely traditional, namely; caste net, stake net (kattudel), katta, brush pile, kadippu del, angling, crab pots, scoop nets, karakgediya, irati, ja – kotu, kemana, and dip nets. The other methods are; gokran dela, hand trawling net, gill net, drift net, polychete worm digging, cross net, drift net, trammel net, and gawana dela. (Jayakody, 1994).

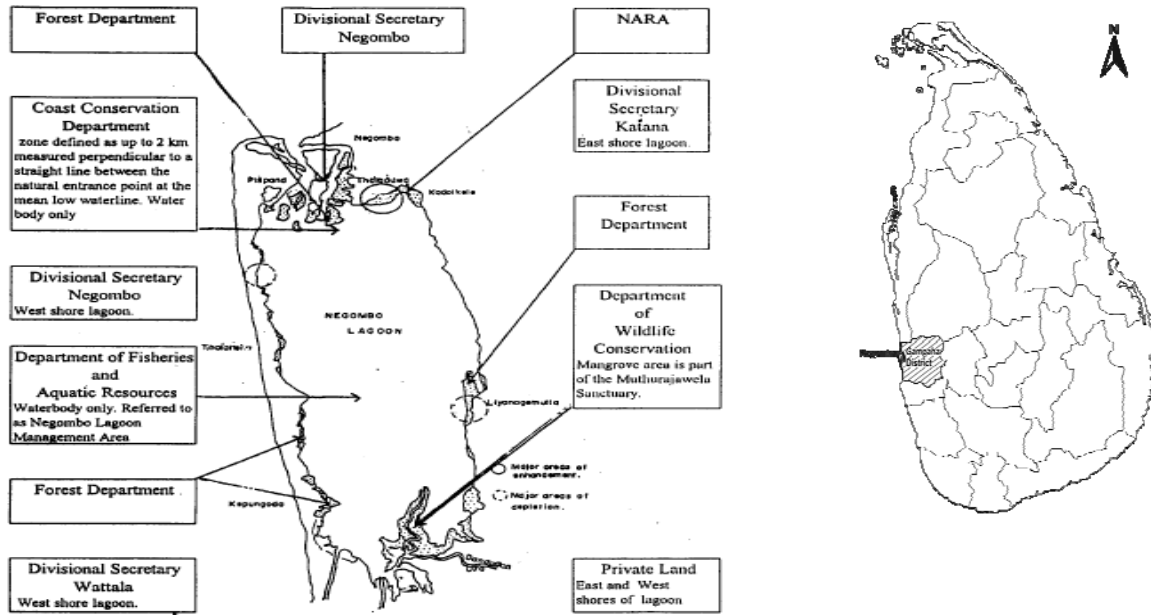


Fig 1: Negombo Lagoon

This paper is mainly focused on one of the traditional fishing methods practised in the Negombo lagoon called kattudel (stake seine) fishery. The main objective of the study was to analyze prospects and challenges of the fishery. To achieve this, a SWOT analysis was carried out (Table I).

Kattudel (Stake seine) Fishery in Negombo lagoon

Kattudel fishery is restricted to one particular community in the area. The main important feature of the fishery is availability of property rights. Lack of property rights appears as the main problem in all other fisheries that have been eliminated in the kattudel fishery. The fishers who engage in the fishery must have a property right to have access to the fishery and be a member of the kattudel association, which regulates and monitors the fishery in a sustainable manner. The fishery targets on prawns especially *Metapaneus dobsoni* and *Metapaneus moyebi* (Jayawardane, *et al.*, 2000.).

Kattudel or stake seine nets are passive gears with two wings and a cod end. The cod end is called “thuriya” (Fig 2) , where the trapped prawns, shrimps, crabs, and fish accumulated. It is operated in narrow channels closer to the lagoon mouth. Usually, it lays 30 – 40 m sea ward from the lagoon mouth. The nets are fixed by the two wings and also to the bottom by post/stake. The nets set against the water current with the onset of evening movement of tidal waves where the water current flows from lagoon to sea. This water current helps to migrate prawns from the estuary back to the sea. When the water current goes through it, enables to catch all types of crabs, fish, and prawns. Since, the fishery is entirely influenced by the tide, high production can be noticed during the full moon days and on heavy rainy days.

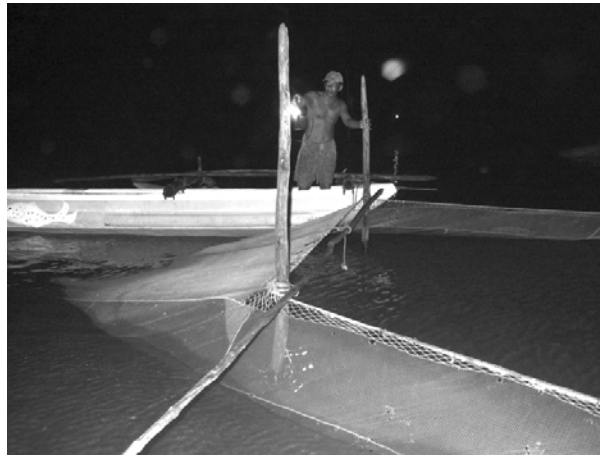


Fig 2: A laid stake net (Kattudela)

The operating time is from onset of dusk (6. pm) to the night or until the dawn (6 am), next day. The time duration depends on the fisher. Any how, the responsible fisherman stays at the place through out the duration. Time to time the net is pulled back to get the harvest. The kattudel fishermen sort the entangled catch at the same time and release juvenile or undersized ones back to the sea (fig 3). It ensures that the fishers can harvest well matured, proper sized prawns, which are not bearing eggs nor in the spawning. It is an important hint given by the fishing for its sustainable management. For this, they use a kerosene oil lamp, called ‘jamparaya’. Since, other lanterns such as gas lamps, high voltage bulbs are not allowed to prevent the light effect that can be forced on fish. Also, light fishing is one of the illegal fishing technique in Sri Lankan fisheries. Kattudel fishers have a unique traditional container to collect their harvest called ‘mokkani koodaya’ (fig 4) made up of cane. ‘Athanguwa’ is used to get the harvest that enables them to release the unsatisfactory sized back to the sea without giving them any stress as well as can get a better premium for live stock from the buyers. The station where they tie their nets, and engage in fishing is called ‘kattudel paduwa’ (fig 5). More than two or three fishermen can be operated at the same time in one station. Three such stations are prevailing in Negombo lagoon famous for highest harvest, namely, Kongaha, Keerikkattuwa, and Modella. Among those, fishermen believe Kongaha as the best kattudel paduwa, which gives a higher return for their sweat.



Fig 3: Sorting the entangled prawns, fish and crabs



Fig 4: Transferring the harvest in to the *Mokkani koodaya*



Fig 5 : Kattudel Paduwa

There are four villages involved in kattudel fishery attached to the Negombo lagoon. Those are; Pitipana, Duwa, Grand street (Maha weediya), and Sea street (Wella weedia). Each village has a kattudel association and around 50 male villagers hold the membership. All four associations collectively form one main kattudel association based on the Catholic church. Totally 300 members have been registered in the main association. That membership descends from father to son. The main purpose of this association is to work as an intermediation to solve the problems faced by traditional kattudel fisher folk and negotiates with relevant sectors and authorities in order to bring justice for the members. Once a person got a membership in the association, he receives a certificate to prove the ownership of the share of the fishery called 'pella', which is recognized by the courts of Sri Lanka. This can only be transferred within the male family members through inheritance and selling is completely forbidden.

Requirements to be a Kattudel fisher

In order to be a member, the interested person should fulfill certain requirements : the basic requirement is that the applicant must be a Catholic within the age range of 18 and 50, and a descendent from a kattudel fisher because, the property rights flow from father to son. More over, the person could be able to operate kattudel and should posses his own canoe, nets and other fishing equipment. He should make sure that the nets have been prepared according to the set standards and guidelines.

PROSPECTS AND CHALLENGES OF THE KATTUDEL FISHERY

SWOT Analysis

Table I : SWOT Analysis for kattudel fishery in Negombo Lagoon

<u>Strengths</u> <ul style="list-style-type: none"> ·1 Government has given the legal recognition by means of a gazette notification ·2 K. Association monitor the fishery without any confrontation ·3 Provision by Catholic church induces the fishers confidence ·4 Generate higher income than average income of Negombo lagoon ·5 Well defined property rights and bidding system minimize the conflicts among fisher folk 	<u>Weaknesses</u> <ul style="list-style-type: none"> ·1 Slight decrease of members in the k. association ·2 Lower intense to approve their loans at the fisheries association ·3 Lower level of subsidies and incentives compared to other fisheries in the lagoon ·4 Lack of skilled personnel to work on kattudel
<u>Opportunities</u> <ul style="list-style-type: none"> ·1 Has an attainable demand ·2 Can sell any amount at a relatively higher price ·3 The fishery can sustain due to its sustainable practices ·4 Fishermen can involve in any other activities during the day time 	<u>Threats</u> <ul style="list-style-type: none"> ·1 Younger generation reluctant to involve in the fishery ·2 High cost of standard quality fishing equipments ·3 Stock depletion ·4 Subsidies given by the government are declining ·5 Pollution in the lagoon and other canals

Strength

The association is the back bone of the fishery. It helps to mitigate all the hindrances, which appeared in the fishery and monitor with out any confrontation. The main role is played by the

Catholic church. It gives them confidence and belief. It encourages the members and ensures the unity and harmony of the association. Hence, one tenth of the income obtained by kattudel fisher should donated to the church. The fishery has an unattainable demand and they catch prawns and crabs in live form. Such live harvests receive higher revenue where the buyers come to the kattudel paduwa and make the deal. Further, the association negotiates with the Ceylon Fisheries Corporation to sell their harvest at a higher price. The harvest is fresh, undamaged and attractive. In fact, the fishermen do not meet any marketing problem or dissatisfaction about the price. This leaves a higher income level than the average income of the other lagoon fishers'. The association has the legal recognition obtained by a gazette notification (Gunawardene, 2005). The share of the fishers called 'pella' is a valid certificate accepted by court of Sri Lanka.

Weaknesses

The major weakness of the fishery is lack of members. The younger generation moves away from the fishery and the total percentage of members involved in the fishery has been reduced from 8 percent in 1994 (Jayakody, 1994) to 4 percent in 2008. This is a weakness as well as a threat to the fishery about its sustenance and the future. It brings an uncertainty about their traditional livelihood practice. The younger generation are not skillful to operate kattudel and reluctant to get the know how from adults. Therefore, the future of the kattudel fishers' and the skills of fishermen are questionable. As mentioned earlier, the kattudel fishery is a small scale, traditional fishery which contributes a small fraction to the entire fisheries production. The members of the fishery also reducing day by day. In fact, the government attention goes away from the fishery. Since, other fisheries are operating in large scale by contributing largely to the national economy, the government provides much loans, incentives, and subsidies to promote such profitable commercial fisheries resulting step mother's treatments to the artisinal fisheries like kattudel. More over, the fishers complaint that the possibility of loan approval from the regional fisheries association (Dheewara samithi) are very low and delay the approval. In that connection, the kattudel fishers face tremendous difficulties to get the financial assistance, incentives, or subsidies through the regional fisheries associations or from the government.

Opportunities

The kattudel fishery is a lucrative fishery with an unattainable demand. Since, the harvest is obtained in live form, buyers come directly to the kattudel paduwa and buy at a higher price. Therefore, the kattudel fishers' income is relatively higher than the average income of other lagoon fishers in Negombo. The limited access ensures considerable harvest for each and every fisherman and this guarantees a resource rent for them. The foundation given by the Catholic church would converge all towards unity and sustenance of fishery by strengthening their morality. The fishery is only done at night from 6 pm to 6 am of the following day. Hence, they can involve in other livelihood activities as well; such as carpentry, fishing, sales.

Threats

The kattudel fishery totally depends on the productivity of the lagoon. The productivity of the lagoon is directly affected by the purity of the lagoon water, availability of mangroves, aquatic flora and fauna, safety habitats and breeding places for shrimps and fish. But, the recently

boomed shrimp farming causes a severe havoc to the lagoon and the surrounding environment. Shrimp farmers pump out water and divert waste water drains to the lagoon causing pollution in the lagoon aquatic environment and affect the water quality. More over, the mechanized boats within the lagoon adds a negative externality to the fishery. Due to those motorized boats, the lagoon has a layer of kerosene / diesel, which gives an irritative stench to the water. As a result, certain fish and prawn have got absorbed that odour and became uneatable, which creates poor quality, and low market value. The kerosene and diesel in the lagoon badly affect on the lagoon environment and kill aquatic plants, fauna, and destroy their breeding grounds, too. Another problem encountered by kattudel fishers' are speedy boats operating in the lagoon. Those disturb the breeding habitats of prawns and become a threat to the kattudel nets at night. In order to overcome this, the fishers use the kerosene lamp to demarcate their netting area.

The kattudel fishers need to fix posts / stakes at the kattudel paduwa to tie their nets. This has lead to a chaos with non kattudel fishers in the lagoon. They complain about pits in the lagoon bed due to the digging holes to fix stakes. Hence, the kattudel fishers are always blamed and pointed out by other fishers for destructing the lagoon bed and the habitats of the lagoon environment.

CO – MANAGEMENT APPLICATION

Decentralized decision making power by means of a 'Local Fisheries Management Authority' has been given by the national fisheries and aquatic resources Act; Act No: 20 of 1996. The local fisheries management authority deals with local fisheries associations and mediates to settle disputes among user groups. This can be defined as one forms of co – management. An example can be taken on to the podium from Chilaw lagoon kattudel fishery, which was ended up by imposing a new regulation called 'Chilaw lagoon Fishery Regulation of 1993'.

The Chilaw lagoon kattudel fishery also under goes similar conditions as in the Negombo lagoon kattudel fishery; such as, coherent with Catholic church, affiliation to the traditional fisheries owner Association, male descendant ownership...etc. In the Chilaw lagoon kattudel fishing rights are shared between three clans. In early 1990s there was a huge argument and conflict with other fishers, who were fishing for shrimps using haras del, caste net, and trawl. The dispute lengthened to the court and could formulate a new regulation specified only for the Chilaw area. According to that, the mechanized prawn trawling was prohibited up to one mile from the coastal belt in the areas of Southern bank of the *Deduru oya* and *Ambakandawila* in *Chillaw*, Sri Lanka. Tuesdays, Thursdays, and Saturdays prawn catches by other types of crafts were prohibited; but allowed on Mondays, Wednesdays, and Fridays. But from the effect of 10th March 1992, prawn trawling was completely banned by Ministry of fisheries and aquatic resources by a police order. All the 137 prawn trawling vessels were destroyed and 132 crew owners and 663 crew members were compensated.

(Ariyadasa, 1994)

Similarly, in Negombo lagoon, the kattudel fishers are well organized at the community level by forming four Rural Fisheries Societies (RFSs) from four main villages who are practising kattudel. They follow the rules made by each of RFSs at the local level and regional level. The central government legally devolved the management authority to the RFSs through the Negombo kattudel fishery regulation (Amarasinghe, *et al.*, 1997 in <http://www.ecologyandsociety.org/vol11/iss1/art45/>).

Government Contribution

Traditional fisheries are one important item, which shows the historic value of a nation and prestige of a country. In fact, the government must pay their attention by facilitating such fisheries in many ways. As such, the government provides subsidies, incentives, and relief loans to kattudel fishers to buy nets, canoes, and other fishing equipment. Extension services and advisory programmes are organized with skilled personnel to make kattudel fishers well aware of sustainable measures and the importance of sustainability in small scale fisheries like this. The members of the kattudel association were encouraged to get the membership in the regional fisheries association in order to give them an equal chance and benefits as other fishers. The government has introduced a special relief loan system for kattudel fishers where they can have access and apply it easily. Moreover, the government has created a link between kattudel fishers and the Ceylon Fisheries Corporation to sell their harvest without any marketing difficulties, but at an attractive price.

Though these benefits have been provided by the government, it is gradually declining. The fishers complain that the attention and the allowances given by the government are being cut down step by step. Though, they were promoted to register in the regional fisheries association, it does not meet the equality concerns up to the level they expected. Therefore, the kattudel fishers are unhappy about the government contribution and poor attention paid on this traditional but lucrative fishery that operates at a sustainable trend line.

SUSTAINABLE MEASURES IN THE KATTUDEL FISHERY

The fishery is a regulated fishery where the open access nature has been restricted by providing property rights. Almost all fishers should be members of the kattudel association that can assure the unity and harmony of the fishery. The access to the fishery has been limited by restricting chances to be a member and, the membership descent only from father to son. The fishery runs smoothly without any conflicts according to the rotational lottery system monitored by the association. Collective decision making, collective social responsibility are main key features to define its co – management application. It ensures the effective community participation in decision making and problem solving.

Normally, the mesh size of the kattudel is more than one inch. It assures only larger prawns for the catch. Also, sorting is done once they took out the harvest. This is a given chance for undersized, immature prawns or crabs to be back in the water. The kattudel fishermen are trying to maintain the surrounding mangrove and the lagoon in an environmentally friendly manner. They use the mangrove to get the stakes / posts for the fishery. But, they are obliged to use the

mangrove without any destruction. Moreover, the members of the association involve in activities to clean the mangrove and the lagoon by means of “shrama dana” campaigns.

Challenges

One of the key objective of this study is to point out major challenges faced by kattudel fishers in the Negombo lagoon, Sri Lanka. The interviewed fishers proclaimed that the pollution in the lagoon is unavoidable due to kerosene / diesel layer, polythene, and garbage dump near the mangrove and lagoon. Polythene and other non degradable materials dumped here and there around the lagoon destroy the fish habitats and indirectly causes for fish mortality. In fact, the fishermen operate campaigns to clean the lagoon proximity. But, this does not suffice solely to mitigate the unending garbage challenge. Another important fact that we have to pay our attention is, the number of fishing stations (kattudel paduwa) is gradually decreasing due to the sedimentation and the recent landward changes taking place. The Muthurajawela marshy lands and a part of mangrove were filled for construction. The impact of such activities directly noticeable in this silent prawn fishery as sedimentation in the lagoon and attached water canals. It modifies the environment of canals and lagoon which may lead to habitat modification, stock depletion, and shallows down the water depth in the fishing stations.

As discussed so far, the kattudel fishery is an ancient traditional fishery dominated by one group of fishermen in the area. Though the fishery seems to be very lucrative, it operates in small scale. Hence, the government contribution and motivation are in a declining phase. The fisher folk under goes difficulties when getting incentives, subsidies, and loans through the regional fisheries association. Such hindrances discourage kattudel fishers and leads them to quit the fishery due to the depression. Consequently, the younger generation reluctant to engage into the fishery and the number of members decreasing continuously. In this connection, the future of the fishery is a real challenge to the kattudel association.

Suggestions

In order to maintain the fishery in a sustainable manner, the community suggests certain precautions. The kattudel association needs to assure the attractiveness of the fishery and retain the traditional descendants in the fishery. Hence, the members request the fishing equipment, nets at a reasonable, cheaper and affordable cost. Moreover, any of subsidies and incentives should be distributed with the intermediation of the kattudel association, but not via the regional fisheries association. Unless such activities are eliminated, hardly any equality for the kattudel fishers at the regional fisheries association could be noticed. Further, the association expects special loan schemes to buy the nets and canoes at a subsidized price.

Further, the fishery extremely depends on the sustainability and productivity of the lagoon. The pollution in the lagoon, surrounding mangrove, and water canals badly affect the productivity of the fishery. Also, the constructions and land filling activities indirectly deplete the fish and shrimp stock irreversibly and modify the lagoon environment. In this connection, the pollution, garbage dumping, and unauthorized constructions and land filling (anthropologic activities) should be banned immediately.

The kattudel fisher folks love their traditional fishing technique and they really need to protect it. The kattudel association needs to carry out the fishery smoothly ensuring the sustainability in the fishery promising maximum return to their members. Hence, they expect to solve their problems, and mitigate the challenges to have a fruitful fishery. Ipso facto, the suggestions put forward by the fisher folk would be important. Since, all the decisions are taken collectively with the participation of all the members these issues and suggestions represent the entire kattudel fishery.

CONCLUSION

In today's term, the fisheries are suffering from lack of property rights. It has been identified as the main problem, which prevents an efficient management in the open access fishery. But, this hindrance has been eliminated in a traditional small scale lagoon fishery in Sri Lanka. In kattudel fishery, the property rights have been shared among fishers by forming a kattudel association. The members get the opportunity to engage in fishing based on a lottery system under a rotational mechanism. The fishery's profitability mainly depends on the sustainability and the productivity of the lagoon. More over, the current economic depression and the sectoral development draw the attention of government away from these traditional fisheries. Since, the fishery veils around one community, the sustainability of the operation is paramount for the sustenance of the community. In fact, the fishery demonstrates valuable sustainable measures that would be very important for other unregulated fisheries in order to over come the over exploitation and stock depletion. Lack of motivation and poor patronage lead to keep away the younger generation from fishery. The pollution in the lagoon, environmental degradation, mangrove destruction are some of the overwhelming challenges that jeopardize the fishery. But, still the healthy, large, live prawn harvest ensures the profitability of the fishery in spite of so many obstacles. The traditional kattudel fishers need to conserve their inheriting fishery . Hence, it is vital to pay more attention on this lucrative fisheries and assist them for its sustenance in order to protect the ancient traditional fishing technique and the community that gives us golden sustainable strategies silently to the entire fisheries societies.

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