

## Community-based fishery management

## Fishing by turns

**The *paadu* system of fishery management used in certain fishing villages of Tamil Nadu, India is unique**

**T**he Pichavaram mangrove forest, located in the coastal districts of Cudalore and Thanjore in Tamil Nadu, India is of the estuarine type. This forest is surrounded by four main fishing villages, namely, Killai, Thandavarayan Cholagan Pettai (T.S.Pettai), Kodyampalayam and Palayaru. Nearly 60 per cent of the fishermen from these hamlets are completely dependent on the mangroves for their livelihood. The remaining 40 per cent utilize fishery resources of both the continental waters and the mangrove wetlands.

From time immemorial, the fishermen of Tamil Nadu have been following a traditional system of fishery management in the backwaters and estuaries. This system of management is locally called *paadu* or 'rotation' system. In the Pichavaram area, this traditional system is called *vunuvalai kattit* (*vunu* = stake; *valai* = net; *kattu* = regulation). This is mainly followed to manage fishery resources in the backwaters connected to the mangroves. In the Pichavaram mangrove waters, the intensity of fishing activities is mainly related to seasons.

Fishing during the summer season (mid-February to mid-October) is called *kodainaal* fishing (*kodai* = summer; *naul* = days) and fishing during the north-east monsoon season (mid-October to mid-February) is called *vaadainaal* fishing (*vaadai* = north; *naal* = days). The summer season is the lean season for fishing in the mangrove backwaters. During that time, the catch per unit effort is low, while the fishery abounds during the monsoon season.

In the traditional system of fishery management, fishing with any gear other than stake-net is restricted. To fish with *vunuvalai*, fishermen have to strictly

follow the *paadu* system of management. One of the main aspects of this management system is related to the place and period of using stake-nets. The stake-net is normally used to catch prawns by putting it across the tidal creeks, channels and other large canals, particularly during the low tide when the prawns move towards the sea. In order to evenly share the resources, certain regulations are followed.

Villagers should engage in fishing only in areas of the backwater earmarked for them. Fishermen from other villages should not enter into areas earmarked for others, even if they catch less of prawn and fish in their allotted areas. The areas earmarked for a particular village are subdivided into smaller areas with different names and the village fishermen are divided into different groups. Each group should fish in all the selected areas on a rotation basis.

Each fishing village in the Pichavaram area has its own traditional system of fishery management. This can be illustrated by the following example. Killai village is one of the main villages that depends on the mangrove fisheries. The fishing population of this village is distributed in seven hamlets.

All the fishermen from these seven hamlets are grouped together and divided into six groups of approximately 60 to 80 fishermen. Each group is called a *kattu*. In the mangrove backwaters, five fishing areas have been earmarked for Killai fishing village.

### Moving around

Of the six groups of fishermen, the first five will fish in five different places together as one group, moving from one place to another. The sixth group will not

go stake-net fishing on that day but go fishing individually instead.

**E**ach group's members go out together with their nets and canoes to their respective grounds and place the stake-nets across the canal in single or double rows, depending upon the availability of the prawn catch. In the end, all the catches are put together and divided equally among all the members engaged in fishing on that day. On the next day, the sixth group can go fishing in the first ground, and the first group in the second ground, while the second group goes to third ground, and so on. The fifth group rests on that day and engages in other individual fishing activities.

Thus, every group covers all the five places in five days and rests on the sixth day, and the rotation starts again on the seventh day. Each group thus fishes in an allotted area once in seven days. This is mainly to avoid overcrowding of the area where fish and prawns are available in large quantities. This system of fishery management not only helps in avoiding overexploitation but also provides an opportunity for equal sharing of the fishery resources among the fishermen.

The other fishing villages also have their own *paadu* system and each village respects the *paadu* system of the other villages. Every year, the fishermen conduct meetings to admit new members

to the groups or *kattus*, following requests and also to ensure that all the groups are balanced in number.

The *unuvali kattu* system evolved thus: Earlier, when the population was small and the number of families few, there were more fishing areas. *Vunuvalai* requires more labour, nets and canoes. To ensure these inputs, family members who, earlier, went individually to some selected grounds for fishing, were grouped together.

In this method, those who reached the fishing ground first could occupy the entire ground and block access to all the fishes and prawns, while those who reached a little later would have lost their catch. Also, those families which were larger in size could dominate the village and effortlessly occupy the good fertile grounds, without permitting other weaker groups to come in.

#### **The *paadu* system**

To avoid these two problems, the villagers came to agree on a *paadu* system through which, on a particular day, one family goes to one place and another family goes to another place. On the next day, the first family goes to the second place with their family members. In the course of time, the original strength of each family increased through new linkages via marriage. The village population was grouped on the basis of *vagaiyaras* (families).

**D**ue to declining fish resources as a result of siltation of many fertile grounds and the reduction in the flow of fresh and sea water, the Killai fishermen used to go to the Colerone river mouth, namely, Palayar, to fish during the summer (when the catch in the backwater is generally reduced) as well as in the backwaters, and return to their home village when the north-east monsoon started. In the course of time, some of the fisher families who had migrated did not want to return to Killai. But they found difficulties in taking part in the *paadu* system, since most of the demarcated areas were too far away. So they wanted separate areas for their stake-net operations. This matter was discussed in the Killai village panchayat (local council) and the claim of the Palayar fishermen was accepted.

Finally, Killai had to part with two *paadus*, with the condition that they must be used only by the Palayar fishermen who migrated from Killai and not by others who migrated from other fishing villages. Later, this condition was ignored and these places began to be used even by those who had migrated from other villages.

There are also other traditional methods of fishery management. Fishing for ray fish in the Coleron estuarine area using gill-nets has been banned by the local fishing community for the following

reasons: Ray fish fishing needs vast areas to operate and thus hampers other fishermen from fishing. Ray fish fishing takes longer, around 12 hours-fishermen have to keep their nets in the water undisturbed throughout the night. This too prevents other fishermen free access to the area. It is to avoid this and also to give a chance to others that ray fish fishing was banned at the community level.

Another method of traditional fishery management is migration of fishermen to different places. During the summer, the fishery resources in the backwaters decline. The quantity of fish available then is normally not enough for all the fishermen living around the backwaters. So, many of the fishermen do not go to the backwaters to fish during that season but instead go to the sea. This reduces the population pressure on fishery resources in the backwaters. During the monsoon season, the fishery resource in the backwaters increases and so most of the fishermen fish in the backwaters. This also prevents the overexploitation of the fishery resources of the mangrove backwaters.

#### **Migratory fishermen**

Interestingly, though the migration of the fishermen during different seasons reduces population pressure on fishery resources, it increases the dependency of the migratory fishermen on forest resources, particularly fuelwood. During

the summer, fishermen from Killai village migrate to the seashore and develop settlements, which, being on the seashore, have no suitable land for growing any tree species that can be utilized as fuelwood. They thus have to depend on the mangrove forest.

**F**or a long time, the fishermen of Pichavaram mangrove backwaters enjoyed fishing in the backwaters without any external disturbance and, at the same time, they managed the fishery resources at the community level by self-regulation. In recent times, apart from the traditional fishermen, other communities, such as *Vedar*, *Vanniyars* and Scheduled Castes, have also started fishing in the mangrove backwaters. The fishing methods that these non-traditional fishermen follow are destructive to both fishery and forestry resources of the Pichavaram mangroves. The 'bundling' method of fishing followed by the *Vedars* prevents free flushing of the mangrove forest floor and even causes stagnation of tidal water and thus affects the biophysical conditions of the mangrove forest.

Due to the development of aquaculture farms in the region around mangroves, the demand for prawn seeds increased sharply over the last five years. The cost for each seed is between Rs 0.50 and Rs 1.00 and this attracts the non-traditional fishermen, particularly *Vanniyars*, to catch only prawn seeds in the backwaters. This goes against the wishes of the traditional fishermen who never exploit prawn seeds, since they know that this will affect future fishery resources. They asked the *Vanniyars* to desist from catching juveniles. But the *Vanniyars* refused to obey, emboldened by their majority status in the population. This led to communal clashes between the two groups and ultimately paved the way for the *Vanniyars* to stop fishing the juvenile prawns.

In recent times, according to the fishermen, fishery resources have slowly begun declining, due to siltation of the backwaters and creeks, and reduction in fresh water supply, and also due to the closing or silting of river mouths during the summer season. At the same time, the fishermen population has increased,

while other communities have also entered the mangrove backwaters. As a result of declining fishery resources and the heterogeneous nature of the communities utilizing fishery resources, the management of the fishery has become complicated.

According to the elderly local fishermen, at one time, the Pichavaram mangrove forest was very thick and trees were very tall. Each trunk of the *Avitennia* tree, particularly of *Avicennia officinalis* (*karungkandal*), was so huge that a single person could not put his arms around a tree. Now, according to these elderly fishermen, the forest cover has diminished to less than a quarter, and the tree density has been greatly reduced. They also say that now they see only shrubs, not big trees.

Several reasons are offered to explain the degradation of the Pichavaram mangrove forest. According to the local people, until 1972, the Department of Forest followed the coop system for tree-felling. They say that five coops were conducted between 1952 and 1972 in various areas of the Pichavaram mangrove forest. Only local people took the contract for felling the trees. In this system of tree-felling, the contractor should cut the matured and dead trees about 1.5 feet above the ground level within the area specified.

The area covered by one coop was about 30 acres and, altogether, seven coops were given for felling. Thus, the total area in which felling was permitted was about 210 acres. The labour charge for felling the trees was Rs 2 per tonne, while transportation by boat cost another Rs 2 per tonne. In all the coops, felling was carried out over the 20 years between 1952 and 1972. The coop system has since been abandoned.

#### **Rampant felling**

According to local people, the contractors used to remove all the trees, irrespective of age, ignoring norms and conditions. They also removed more than they were permitted. The villagers say that, after the felling, not a single tree has grown in these areas. The villagers also say that in certain areas, land has been converted into farming land and is now being used for the cultivation of groundnut.

Since 1972, the trees of the Pichavaram mangrove forest were felled on a large scale mainly for festivals, marriages and cremations. This mass felling of trees was carried out with the knowledge of the forest officials. During the festival season, the Forest Department used to publicly announce that villagers were allowed to fell trees for festive reasons. This resulted in unrestricted felling of trees during festivals. During weddings, invitations were given to the local forest officials by the head of the family, and consent for felling trees obtained. These practices, however, stopped about ten years ago.

The mangrove forests of the Pichavaram area have also been degraded by the collection of firewood for domestic purpose. But during the last five or seven years, local people say, collection of firewood has reduced, mainly due to strict enforcement of laws by the Forest Department. However, informal surveys reveal a continuous removal of large trees and twigs from the mangroves for domestic use.

All the local people believe that the mangroves are not degraded by grazing. In fact, some of them say that grazing actually helps the mangrove trees to grow since the cattle plough the ground with their hooves, apart from providing organic manure in the form of urine and dung.

The elderly fishermen of the area fully understand the importance of mangroves for fishery resources, protection against cyclones and soil erosion, etc., but do not have any idea on conservation. Most of the elderly fisherwomen were not aware of the importance of mangrove forests, but were willing to accept the truth. At the same time, they have the feeling that cutting wood for fuel is harmless to the forest. The youth among the fishers know the importance of the mangrove trees but also lack any idea on how to conserve them.

All of them, however, blamed the Forest Department officials for giving permission to cut the trees under the coop system, and for illegal felling in the past. But they also said that the forest officials are now strict in protecting the forest. ♣

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