

## **'The role of public-private cooperation in the management of estuarine fisheries: Learning from the Kerala model of co-management'**

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Traditional communities have come back to the centre of policy making once again as many countries of the world of late have recognized their role and relevance in the management of natural resources (Balland and Platteau, 1996; Agarwal and Gibson, 1999; Berkes, 2003; Ostrom, 1990). Despite this general consensus, the manners in which communities are recognized, incorporated and permitted to manage their own resources vary considerably across countries. Most often, the central agencies do not provide enough space for local communities to participate in resource management. At the same time, top down governance fails to mobilize cooperation of local communities to deliver sustainable livelihoods that ensure fair and equitable distribution of resources across generations among men and women. There are however exceptions to this general failure where local states and communities cooperate in the management of resources. The objective of this paper is to present the history and present structure of such a co operative arrangement in the management of fisheries in Cochin estuary. We shall highlight how the local state (Grama Panchayath) and communities together share the responsibility to allocate fisheries to various fishing groups and private entrepreneurs in the northern side of the Cochin estuary. The study also focuses on the role of various traditional management institutions to ensure resource sustainability and equitable distribution. The paper is organized as follows. After sketching the ecological/environmental setting of the study area in section 1, the paper narrates the history of management in section 2. Section 3 describes how local Panchayath took over fisheries management and explains how it manages

fisheries with the help of private entrepreneurs and local fishing communities. This section also narrates the benefits accrued to various parties in joint management and the various formal (state and local state level) and informal (non state) rules and regulations that govern various organizing practices in the study area. Section 4 explains the nature of conflicts in the area with respect to the sharing of resources and presents how these are resolved and section 5 discusses the limitations of this local cooperative arrangement. A conclusion follows.

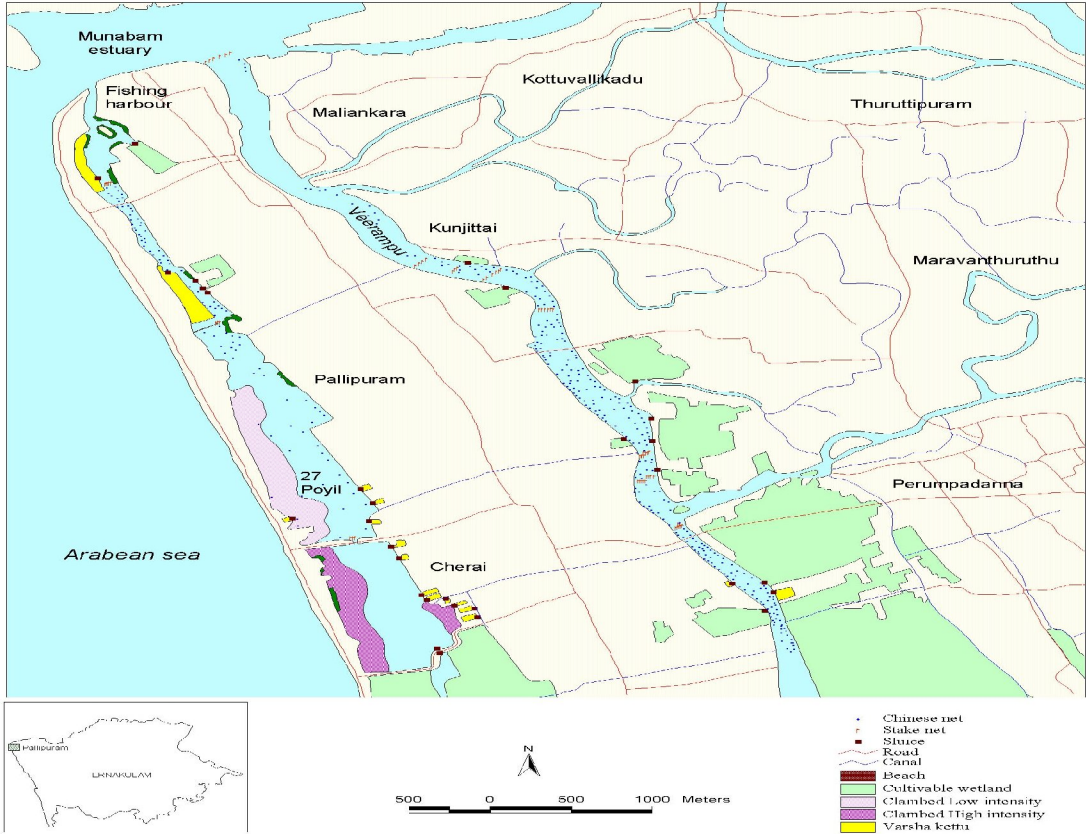
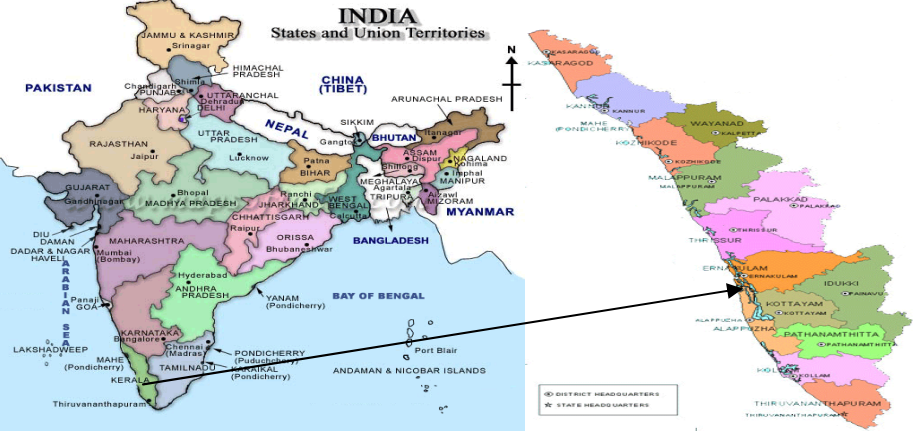
### ***Ecological/environmental setting of Cherai poyil***

Cherai Poyil is a brackish water pond with an area of 210 hectares located in the Kerala state of Indian peninsula at the extreme north-west opening of the Cochin estuary, which opens to the Arabian Sea at Azheekode. (See map 1). As shown in the map the Arabian Sea enters inward through two channels at Azeekod. The first channel that enters into Pallippuram Panchayath through the western inlet and flows southwards towards Kuzhippally Panchayath is known locally as the Cherai Poyil. This first channel then takes a turn towards east and joins back to the eastern channel of the estuary between Kuzhippally and Edavanakkad Panchayaths. The other inlet through which sea water flows into Pallippuram Panchayath lies on the eastern side of the first channel. This water channel, known as Veerampuzha, flows towards south and joins the water entering into the Cochin estuary through the Cochin bar mouth. The "Poyil" is connected to the large water channel Veerampuzha by three other feeder canals viz. Karuthala thode, Vastheri thode and Vadae thode. Water from Veerampuzha kayal<sup>1</sup> enters in to the kappu through these canals during high tide, and recedes back to Veerampuzha during low tide after 30 minutes.

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<sup>1</sup> Kayal is the local name for estuary

# Location map of Cherai Poyil, Cochin estuary, Kerala India



The fishing territory managed jointly by local fishing communities and grama Panchayath is known as kappu<sup>2</sup> and this area is recorded in government revenue books as 26 and 27 purampok<sup>3</sup>. The “26 Kappu” is having bottom contour slanting from east to west. The depth of the water declines from 1.8 meters in the east to 1.2 meters in the middle and further to 0.8 meters in the west. It has an area of 170 hectors and is located 150 meters away from the sea wall. The poyil is 6.25 kilometers long while the kappu has a length of 3.67 Km and an average depth of 1.2 meters. The presence of mangroves around the kappu is very low and therefore ecological services provided by mangroves to local fisheries are minimal. Among the water bodies around this area, Cherai Poyil is considered as Akshayapatram<sup>4</sup> where people fish round the year and make livelihoods. They believed that its resources never get exhausted.

### ***Livelihood activities***

Cherai Poyil is endowed with a variety of resources and local people organize a number of livelihood activities on the water body. The north western portion of the Poyil is an active fishing zone and fishermen use diverse sets of gears like Chinese nets, stake nets, cast nets and gill nets for fishing in this region. This patch of the Poyil is under the control of Fisheries Department. The portion further south is the 26 and 27 kappu which is the fishing zone regulated under the joint management of local fishermen and Panchayath. The gear diversity is also very high in this region. Another resource recently developed in the Poyil is clam and its distribution in the kappu is directly related to the depth of water body and movement of water. Accumulation of silt and sediments is the other

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<sup>2</sup> Kappu is the local name of the fishing zone/ territory where local fishermen organize fishing activities in the Poyil

<sup>3</sup> Purampok refers to land not owned by any private parties but could be used by individuals through formal government procedures and sanctions. Many individuals have procured these through illegal means by influencing local bodies.

<sup>4</sup> Akshyapathram is as eating plate which has reference in the classical Hindu mythology which has the ability to supply food in a sustainable basis.

important reason for the formation of the clam in kappu<sup>5</sup>. Clam resources are abundant in 26 purampokku where the depth and water circulation is low. The density of clam beds are high at 26. Single species clams are mainly present in the pozhi which is villorita cyprinoids commonly called the black clams. Pokkali paddy cultivation is rarely undertaken by local communities of this region due to high salinity and high costs towards desalinization. We estimated that the total area of the cultivable wetland is which has a depth range of 0.4 to 1m. Traditionally, farmers cultivated paddy for the first six-months followed by prawn culture for the remaining six-months. This crop rotation in fact sustained the ecological and socio-economic balance in these areas. But from the last 2-3 years, people have abandoned cultivating paddy due to low yield and high labor cost and they use these lands to culture prawns. Today there is greater pressure for converting paddy fields into fulltime aquaculture farms called varshakettu. The total area of the varshakettu is 65 hectares and there are 16 prawn farms of which 9 are directly opening to the kappu, 3 to the canals, 2 at chirakkakam and 2 into veerampuzha. Modified semi-intensive of prawn culture system is practiced in all these farms.

The remaining portion of the Poyil is around 40 hectars, which is a common pool<sup>6</sup> water body. This portion is under different property regimes. For instance, the area shaded in yellow is the water body owned by two individuals who now use these water enclosures for aquaculture. The areas shaded in green are wetlands where individual farmers cultivate paddy. These lands are later converted into aquaculture farms after the paddy crop is harvested. The areas shaded in blue are the remaining water channels which are used by the local fishermen for fishing. There are 42 Chinese nets and 7 stake nets, of these, three stake nets are operating in the three canals of the kappu and the remaining nets are located

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<sup>5</sup> Before ten years the clay from the kappu is mined and used as organic fertilizer for the coconut plantations and from past one decade no clay is removed from the *kappu*.

<sup>6</sup> Common pool resources are those resources from which it is hard to exclude users. Such resources could be left as open access without rules or could be managed by a government, as private property, or by a common property regime (**Ostrom E, et.al., eds., 2002**)

in the 27 kappu. Since the Poyil and Veerampuzha are interlinked through various channels, the distribution of fishes in the former depends on the overall fish and shellfish diversity of the surrounding water body. A detailed examination of the species calendar for Veerampuzha reveals that the fisheries of this region are highly diverse. 72 species were recorded in various gears sampled during 2004 (Thomson and Berkes, 2006). Most of the species are available round the year.

## **2 History of fisheries management**

Fishing in Cherai Poyil has been an age old occupation of local communities of this region and their livelihood rights have undergone several changes. Initially, poyil fisheries were under the administration of Cochin State. This was later taken over by Travancore-Cochin state as these states merged into one political unit. When the Kerala state was finally formed in 1956, the administration of poyil fisheries was taken over by the State Fisheries Department. The present joint fisheries management structure has been the product of these state-community interactions during the last century.

### ***Management of Poyil fisheries under Cochin state administration:***

During the first phase of fisheries administration, state concentrated to develop the basic infrastructure to organize various economic activities on the ecosystem. The channel extending from Munampam bar mouth to Nayarambalam was developed by local landlords with state assistance. Since large workforce was needed to reshape the ecosystem, local workers were offered decent livelihoods. Fishermen were using the deeper portions of the water body for fishing while the shallow areas and wetlands were used by the agrarian communities for farming, prawn filtration and coconut plantations. For instance, the saline head end of the water body from Pallipuram to Kuzhipilly was used for fishing while the areas beyond Kuzhipilly (up to Nayarambalam) were used by farming communities for

paddy (pokkali) cultivation and prawn filtration. During this period agriculture (pokkali and coconut plantations) provided the basic livelihoods to local people while fishing and prawn filtration supplemented it. In order to prevent intrusion of salinity and to protect pokkali lands a bund was constructed between the Pallippuram and Kuzhippilly Panchayaths with the initiative of the first Cochin ministry. This state intervention had redefined major economic activities and livelihoods in this area in a big way. People around poyil began fishing and people around the shallow clammy marsh engaged themselves in Pokkali cultivation and prawn filtration. In addition, the state has also constructed a number of canals during this period for dewatering/irrigating pokkali fields. However, there were no specific formal rules governing the access and use of fisheries from this water body. Fishing, agriculture and prawn filtrations were organized by various communities according to locally agreed normative and communitarian principles. In other words, the ecosystem had been altered by the state and wealthy farmers for undertaking various economic activities.

### ***Management of Poyil fisheries under Travancore –Cochin administration***

Before the merger, “26 Puramboke” and a part of “27 Puramboke” were under Cochin state. The merger had changed this scenario and made it easy for state to monitor activities using its staff.

### ***Leasing out fishing rights over government waters***

Fisheries Department of the Travancore- Cochin state retained actual control and ownership of Poyil and had been leasing it out to various parties. The first formal law that governed access to fishing in this water body came to effect in the early 1950's. The Travancore–Cochin Fisheries Act 1950, provided provisions, for the first time, to collect rents from fishermen who used state water bodies for fishing. This law stipulated that local states could collect rents/fees from fishermen who used water bodies within their administrative boundaries. It further stated that

rents shall be recovered in a similar manner as if they were arrears of land revenue. Individual contractors/associations or fishing community associations or their cooperatives could participate in these auctions. The duration of fishing rights was limited to one year and the lessee would directly remit this amount to Fisheries Department before commencing fishing. The auctioneer was bound to grant equitable access to different fishing gear groups in the community. However, the auctioneer enforced too many restrictions on the use of various fishing gears and local fishing communities resisted such allocations dictated by contractors.

### ***Transforming fishing rights to local communities***

In Jan 1955 representatives from three community-based (vaala and araya) societies requested the Government to terminate the leasing system and demanded to hand over fishing rights in the Kappu to local fishermen organizations. Conceding to the requests made by local communities, Government granted fishing rights to three local Societies<sup>7</sup>. For local communities, management of poyil fisheries, especially allocation of access to various gear groups, became the greatest challenge. They however, decided to take over the challenge and introduced a number of reforms to control fisheries. First, before entering into formal agreements with Fisheries Department, each of the fishermen societies discussed various modes/criteria for allocating fishing rights to individuals, the fee to be charged to each gear, whom to sell the product and even the mechanisms to resolve conflicts. As a matter of fact, way back in 1955, local communities agreed on a fee structure applicable to various gears. For instance, Chinese nets were charged Rs. 2.00, Cast net Hand picking were charged Rs.1, Vadivala was charged Rs. 3.00 and pattukanni vala was charged Rs. 5.00 (Thomson and Berkes, 2006). These discussions led to the crafting of various informal institutional arrangements that governed access and

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<sup>7</sup> (Numbers 192,369,283) collectively for Rs 10,518.75 - (1/3 of the amount last auctioned)-for 1 year. The fee had to be paid in four equal installments.



productivity of fisheries. Representatives from each group sat many rounds and reworked their strategies of management. These proposals were then forwarded to the Department for approval. The Department approved these proposals without making many changes. Informal rules acted as by-laws to be followed by individual gear groups and auctioneer. The above descriptions revealed that Poyil fisheries were under the cooperative control of the local Panchayath and fisher communities even before the formation of Kerala state and its Fisheries Department.

### ***Administration under Kerala state fisheries department***

When Kerala state was formed, ownership and control of Poyil were transferred to the Fisheries Department. Although a large portion of the Poyil up to “26 and 27 Purambokku” was freely accessible to local fishermen, the Department of Fisheries continued the “public auction system” in the Kappu. Hence private contractors leased in the primary fishing rights in the water body from the Fisheries Department during the late fifties and early sixties. After taking over the water body the contractor leased out rights to local fishing communities on the basis of mutually agreed terms and conditions. He used this opportunity to collect revenue from gear groups and fishermen were unhappy over this unilateral decision making. Moreover, the Department could not manage the auction process efficiently to the satisfaction of local fishing communities.

### ***3 Moving towards decentralized cooperative governance: Interventions by local state***

By the mid sixties the local Panchayaths became the nodal agencies of state administration at the local level and they were searching for opportunities to enhance revenue. Three local Panchayaths of Vypin block, Pallippuram, Kuzhuppilly and Nayarambalam, noted the practice of rents collected from wetlands by the state and decided to request the state Government for

ownership rights over purampoke lands and water bodies within their administrative limits under the provisions of the Panchayath Raj Act 1960 sections 62, 64, 82, 84&149. But the Fisheries Department was reluctant to hand over the right to local Panchayaths as this move would reduce its income from fishing rents<sup>8</sup>. Many private land owners who owned major water channels also objected this move. After long negotiations, the Government accepted the proposals of these Panchayaths. Hence the 26 and 27 Puramboke water body (i.e. the present kappu) became the property of Pallipuram Panchayath<sup>9</sup> and on 11<sup>th</sup> March 1968 the Panchayath organized its first auction<sup>10</sup>.

Since fishermen groups did not have enough resources to lease in and manage kappu fisheries, the Panchayath was forced to lease out management rights to private entrepreneurs. Local fishing communities- Vala and Araya- objected private contracting and demanded for greater role to fishermen organizations (Mathya Thozilali Sangams). There were 19 such registered sanghams at that time. After long discussions and negotiations, the Panchayath decided to lease out kappu to the “Cherai-Munambam Matsya Thozilali Sahakarana Sangham (FE 51 Branch)” and “Mathsya Ulpadaka Sahakarana Sangham (No 192)”, for an amount of 100 rupees higher than the amount quoted by private contractors.

As most of these fisher organizations were new and did not possess adequate managerial and technical skills to manage resources and finances, the take-over of kappu administration and allocation of fisheries resulted in mismanagement and financial liability. These organizations managed kappu for two years. During the third year, the sanghams received financial assistance from the government to manage fisheries. As the societies incurred huge financial liability, government

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<sup>8</sup> The Fisheries Department however, filed a case against this decision of the State Government. The hearing went on till 1967. Finally, the case was resolved in favor of Pallipuram Panchayath

<sup>9</sup> See government letter No: G/702/L2/66 dated 29/09/1966

<sup>10</sup> The first auctioning was on 12/01/1968. The highest bidder was Mr Kanakad Kunch Achuthan for an amount of Rs. 28300/-

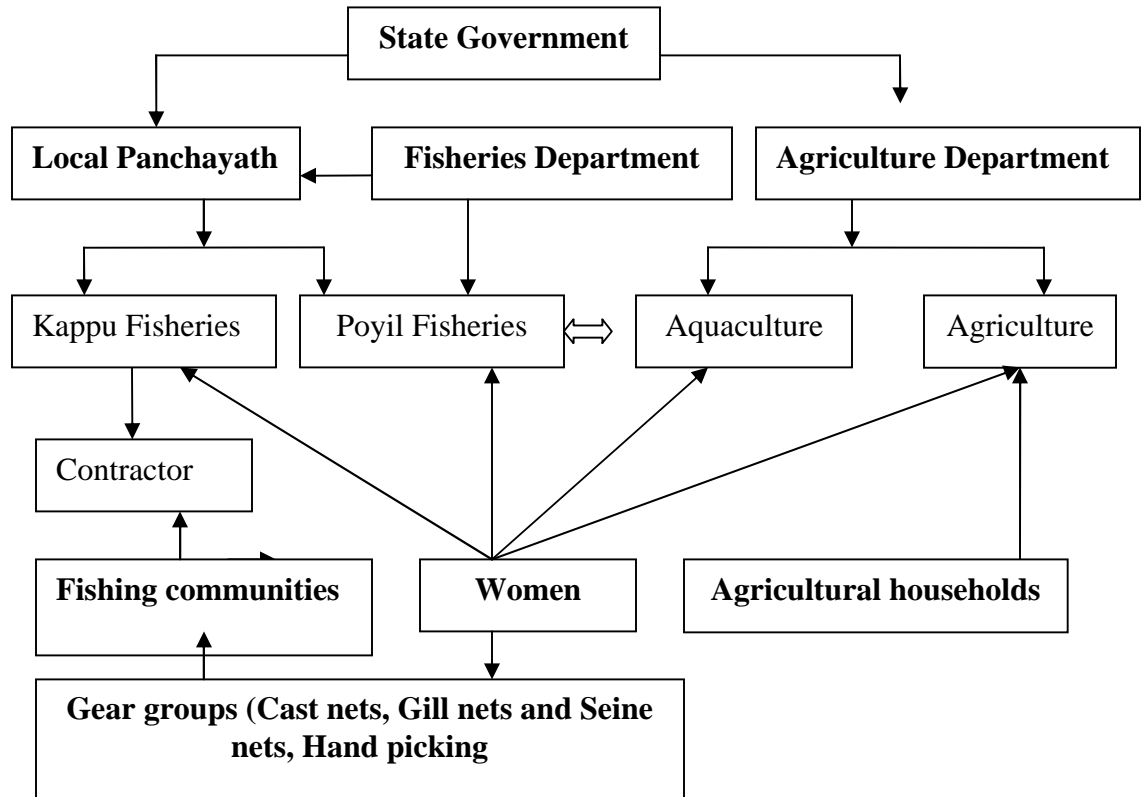
liquidated the fish marketing society. Accepting failure, fishermen sanghams returned the kappu to the Panchayath after a short span of three years of management.

### ***Rights and responsibilities of Panchayath in managing poyil fisheries***

Today, kappu is the property of Pallipuram Grama Panchayath and its management is coordinated by a sub committee which includes elected councilors, fisher representatives and leaders of local political parties. The Panchayath has learned from its past experience that direct mundane supervisory functions were expensive and community cooperation was highly essential to ensure better governance. At the same time both the communities and local Panchayath recognized that community based management might not be feasible for want of modern skills to manage socio-ecological complexities of modern markets. Thus it was quite natural that both of them searched for viable management alternatives as direct management by any one agency appeared to be economically and politically expensive. Thus the Panchayath decided to lease out the primary fishing rights as the leaseholder possessed resources and market information. And then on words the present practice of auctioning system stabilized. The auction amount for the year 2003-04 was Rs.7 lakhs.

An important factor assisted that choice was the stable growth in the volume of trade from the village to international markets. Increasing demand for prawns motivated a number of private entrepreneurs to lease in kappu fisheries and manage it according to locally laid down norms of the Panchayath. They motivated local traders and merchants to take over fishing rights over kappu. The present system of fisheries management is shown in figure 1 below.

**Fig. 1 Organizational structure of joint fisheries management of Cherai Poyil**



***Local institutions for kappu fisheries governance: crafting rules of the game***

The top most authority of kappu management is the Panchayath<sup>11</sup> which participates in this joint management exercise mainly because it receives money from this contract. It leases out the water body to the contractor who in turn allocates fishing rights to various gear groups including women. This transfer however, is subject to a set of rules and regulations regarding the use of different fishing practices, type of gears, mesh size regulation etc. The person who bids

<sup>11</sup> It is on 17-8-1967 that the ownership and fishing rights of this particular property came in to the hands of Pallipuram Panchayath.

for fishing rights has to follow these regulations strictly. An important feature of fisheries governance in Kappu is the role of local institutions. Institutions are rules<sup>12</sup> that govern activities and there exist a variety of formal and informal rules that govern the use of resources in kappu. These rules bring in the necessary order, stability and momentum to the economic activities of local fisheries. When the contractor executes contract, the local Panchayath hands over a written set of rules that direct fishing activities in the kappu during his tenure. The contractor accepts these rules, executes a bond, pays the first installment of the auction amount and takes over the administration from the Panchayath. The following are some of the major operational rules in the local area.

### ***Major local management rules***

- Auctioneer is allowed to fish only from the stake nets situated near the sluice and the distance between the stakes will be 16 meters. Fixing the stake should be with a gap of 5 meters from the bund for easy transportation.
- The display board that shows the fees details of different fishing methods will be placed in a notable place and the auctioneer has to fish only from stake net or sluice net. He is not allowed do fishing with loop net, Koori Vala, Chemeen Vala.

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<sup>12</sup> In ecosystems, physical and behavioral laws control many process and in human systems, controls include physical and behavioral laws, selection mechanisms, and rules in use. The following are seven key types of rules that affect the structure of organizational arrangements.1 Position Rules: These rules specify a set of positions and how many participants are to hold each position2 Boundary Rules: How participants enter or leave these positions3 Authority Rules: Which set of actions is assigned to which position at each node of a decision tree 4 Aggregation Rules: Specify the transformation function to be used at a particular node, to map actions into intermediate or final outcomes.5 Scope Rules: Specify a set of out comes that may be affected, including whether out comes are intermediate or final out comes.6 Information Rules: Specify the information available to each position at a decision mode.7 Payoff Rules: Specify how benefits and costs are required, permitted, or forbidden in relation to players, based on the full set of actions taken and outcomes reached. ( **Costanza and Ostrom-2000**)

- Auctioneer is not permitted to use bag nets(stake nets) without informing the Panchayath when the bund is opened for irrigation purposes
- If the construction of any bund or road by the government for the purpose of transportation from Pallipuram poyil to the beach may cause financial loss to the auctioneer and he is eligible to get compensation only according to the Panchayath Raj Act.
- The current orders of the government regarding fishing have to be obeyed.
- The government order on 17.10.73 in G.O.(M.S)141/73 number for the license fee for traditional prawn farming to be paid to the Department of Fisheries should be paid by the auctioneer.
- The auctioneer is having no right to ask for any compensation for his loss due to the blockage of canal for the construction of bridges or any other developmental activities may come.
- The auctioneer has to do necessary arrangements for the inspection of canals and poyil by the officials of fisheries department and should follow the instructions by them.
- From the poyil for the purposes of irrigation, sluice has to be open and closed when required so the auctioneer is not subjected to ask for any compensation for any loss. It is not allowed to use the net on sluice and any orders from Government or Panchayath should be followed.
- Without the permission of Panchayath it is not allowed to change the location of existing Chinese nets and those who are changing ownership of Chinese net will have to inform officially to Panchayath and the auctioneer of particular year.
- The profit share which has to be paid at Fishermen welfare fund should be paid by the auctioneer and the receipt will be submitted to the Panchayath within the auction period otherwise the particular amount will be deducted from the security bond or prosecution steps will be taken.
- Fishermen are not allowed to use Koori vala (Trammel net) other than the months of Edavam, Midhunam and Karkkidakam (monsoon season).

A close look at the formal rules of the Panchayath reveals many interesting features. First, there are directions to the contractor about the need to organize his activities without obstructing activities of other stakeholders and development activities. Second, there are indications for the type of fishing that he is authorized to undertake and finally there are certain provisions in the contract to uphold the general formal legal processes of the State government with respect to the uses of various coastal resources other than fisheries. The fact that the Panchayath dictates these rules as a pre condition for taking poyil on auction does not mean that the contractor always obeys these rules. In fact, he often violates these rules and conflicts occur due to such violations. Third, most of these are operational rules designed to accommodate interests of multiple users of estuarine resources and services by ensuring an equitable distribution among various gear groups. Fourth, rules are framed as far as possible, in such a way that did not contradict the rules of Fisheries Department which is the formal regulatory authority of estuarine fishery resources. Finally, these rules are extremely sensitive and flexible to the changing requirements of local communities (gear groups) and women.

### ***Roles of various partners in cooperative fisheries management***

The partnership arrangement between local Panchayath and leaseholder and their relations with local communities has been mutually beneficial to the participating agents in a number of ways. Panchayath participates in these joint management efforts as this partnership yields cash income and monetary returns. For the leaseholder, there is clarity in the ownership and tenure which restraint the rest of the communities to encroach on his property. Communities accept his procedure as an ideal alternative that delivers the required management services to kappu fisheries by reducing their risks and uncertainties.

### ***Local state: upholding formal rules and regulations of central and state government***

Being the owner of poyil, Panchayath has to make sure that various gear groups and the leaseholder comply legal codes and regulations passed both by the central and state governments from time to time. These are rules that directly or indirectly impinge on the economic activities (fisheries, aquaculture, public works, irrigation, agriculture, tourism, mining etc.) undertaken by local communities on the estuarine ecosystems. Although the Panchayath is bound to defend these rules, it transfers that responsibility to the contractor and did not strictly enforce them due to the high transaction costs. The central agencies have pin-pointed local Panchayath for these lapses. In other words, the Panchayath adopts an informal approach that delays enforcement of these norms and follows the principle of political lobbying, community participation and negotiations as elements of alternate management strategy. For instance, there are issues between local Panchayath and the costal regulation zone management authority regarding the implementation of CRZ rules within village limits. Instead of implementing these rules in total, the Panchayath has been adopting a policy to negotiate exceptions for the benefit of local communities. Similarly, the Panchayath also act as an appellate authority and intervenes in resolving conflicts between communities and contractors or/and other government departments. It has constituted a committee for this purpose and when ever needed this committee examines in detail issues/conflicts and suggests alternate solutions before the matter is referred to formal legal system for resolution. This negotiated governance works well to resolve resource conflicts between the contractor and fishing communities, although there are still problems and limitations to such negotiations in other situations.

### ***Rights and responsibilities of contractor***

Since the contractor has to pay a huge amount as rent to Panchayath, he reserves right to catch prawns by fixing stake nets. After establishing his “primary rights”, the contractor takes special care to uphold traditional fishing rights of cast net fishers who are the most prominent traditional gear group in the kappu/poyil.



One of the major functions of the contractor is the regulation of entry into the fisheries as a precondition to avoid the “tragedy of the commons”. In fact, he has introduced a system of “entry pass” to grant access to various fishing teams. All gear groups have to obtain this entry pass before commencing fishing in the kappu from the office of the contractor. The list of various gears and the corresponding fees charged by Contractor is given in table 1.

**Table: 1      Fee structures of various gears in Cherai kappu in 2003**

| Gear/practice used | Fees Rs                           |
|--------------------|-----------------------------------|
| Stake nets         | Exclusive right of the Contractor |
| Cast net           |                                   |
| • Kara veesu       | 18 per year                       |
| • kappu veesu      | 35 per year                       |
| Gill net           | 20 percent of catch               |
| Chinese net        | 50 per year                       |
| Pole and line net  | 2 per day                         |
| Stick net          | 110 per year                      |
| Thappidutham       | 3.5 per month                     |
| Clam fishing       | Nil                               |

*Source: Primary data*

The fee structure is differential across various gear groups and is not unilaterally decided by the contractor alone. In fact, the rates and other regulatory regimes are designed by the contractor in the presence nominees of Panchayath in consultation with various gear groups who seek access to the kappu. The rates are proportional to the catch rates of respective gears. For instance, cast net fishers are allowed to fish early in the morning. Since they retain customary rights on the poyil, they are charged only a nominal fee by the contractor as a symbol of accepting their traditional rights. Cast net fishermen also obey this rule system because they benefit from these regulations as it prevents unauthorized access

of other cast net to the kappu and raise their catch rates compared to those who fish outside kappu boundaries. Gill net fishermen are relatively new entrants into kappu fisheries and they are charged on the basis of percentage shares rather than fixed rates. Gill nets are more productive than cast nets and they are allowed to fish mainly during the night. Women are allowed to extract the clam beds located along the western part of the poyil and no fee is charged. This is because removing clams improve the quality of habitat and increase fishing activities in the poyil. This means that community based co management of fisheries as practiced in the Cherai poyil attempts to resolve problems of free access fisheries and the “tragedy of commons” by a cooperative process acceptable to all parties concerned. The contractor also lease in the three feeder canals which bring water to the poyil from verampuzha and sublease these channels to trustworthy private individuals/traders. License to operate the net in the canal is given to the contractor who bids higher rate for the poyil. The right for fishing in these canals is also leased out to other parties to reduce risks and costs.

### ***Enforcement of rules***

The contractor has employed 12 workers for organizing various activities in the kappu and the modes of enforcement, monitoring and graduated sanctions are introduced by him. Out of 12 workers, seven are permanent and belong to the trade union of the Marxist Party, CPI (M). According to agreements among the political party, Panchayath and contractor, these seven workers are employed on salary basis and can not be changed even if the contractor changes without consulting the Party. These workers operate stake net, sort fish catches, issue passes to other fishermen, collect fees, fines and shares of catch from gillnet fishermen, guard the kappu by checking operations of illicit or banned fishing gears and trespassing. These workers monitor kappu round the day and act as enforcement staff in case illicit fishing is reported. If violations are detected, they cease crafts and gears of trespassers and release them only after collecting

appropriate fines. Since the monitoring team is vigilant, very few groups violate rules.

### ***Role of local communities***

Unlike many of the traditional community-based management models where local communities undertake enforcement tasks, the poyil fisheries management model keeps the contractor and his enforcement team responsible for management. Local fishers extend all possible assistance and cooperation to the contractor to bring in social order and efficiency into the system. First, local communities work together to maintain the ecological stability and environmental quality of the water body which is very crucial for the sustainability of various fisheries on which they rely on. There were many instances where communities resisted efforts of modern entrants to pollute water body, although their capacity to resist such efforts has reduced considerably. The first case where communities resisted environmental changes was in the early 1960s. After taking over the administration of poyil fisheries the Panchayath and Fisheries Department together proposed to convert the poyil into a fish sanctuary. In fact, this was an effort to commercialize the local water body by excluding local fishermen from the poyil. All fishermen opposed this move because they believed that such transformation would negate their immediate livelihoods by reducing the productivity of the poyil. After long struggles the Panchayath and Fisheries Department finally abandoned the project. Second, fishermen themselves prevented juvenile fishing and protected primary producer's economic interests. Around 1970's there was a practice of catching the juvenile prawns (*Penaeus indicus*-white prawn- and *Penaeus monodon*-Tiger prawn-) from the poyil for selling to private aquaculture farmers. Fishermen observed that such extractions reduced the overall productivity of poyil fisheries and their catches considerably. Consequently they opposed juvenile fishing and fry collections by fellow fishermen. As the matter involved local communities, the issue was referred to local Panchayath and with its involvement the practice of juvenile fishing was

banned in the poyil. The contractor was authorized to curb illegal fishing and local communities offered all support to maintain the health of the poyil ecosystem.

### ***Public-private cooperation for decentralized management of Poyil fisheries***

The question is whether such locally evolved cooperative problem solving management practices sustain the health of ecosystem and deliver the required services to local communities. Cooperative management as practiced in Cherai poyil brings in a number of definite advantages to local communities. First, regulated fishing guarantees secure livelihoods for local fishermen and women. As seen, women could access poyil without paying fees and collect clam. Regulated fishing also facilitates resource conservation. The management regime ensures equitable distribution of resources and even grants access to outsiders in times of crisis. Moreover the system is highly useful and flexible to manage local level resource conflicts. These economic and social advantages are explained below.

### ***Secure livelihoods***

Since time immemorial, Cherai Poyil had been supplying a highly diversified portfolio of finfish and shellfishes to local communities who exploited these fisheries using various gears. The major fishery of “Poyil” is prawns and finfish landings are comparatively low<sup>13</sup>. We have already indicated that stake net fishery is the most dominant fishery in the poyil today and the right to fix stake nets in strategic sluices is the monopoly of the auctioneer. Fishing using other types of nets is banned within 100-meters where stake nets are fixed. Similarly the contractor also prevents clam fishing while stake nets are operated. There are only four stake nets inside the poyil, which are operated near the sluice gates as per lunar cycles. Around 97 percent of catches is prawns and the remaining 3

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<sup>13</sup> Cochin backwaters have a diverse fish diversity of around 150 species (Kurup, 1989 and Thomson, 2003).

percent is fin fishes. The contractor generated annual revenue of eight lakhs rupees from this fishery in 2003 and this well exceeded the auction amount he paid to the Panchayath to secure fishing rights and management authority. Cast net fisheries, one of the oldest fishing methods in the poyil that employs 400 fishermen made Rs. 60,000 with an average annual income of 32,000 for a period of 200 fishing days. Gill nets also specialize in catching fin fishes and the total revenue earned by gill net fishermen from Kappu amounts to Rs. 1, 15,520. This means that on an average gill net fishing brings revenue of Rs. 317 per day which exceeds revenue earned by cast net fishermen. In fact, this has often led to conflicts between these two groups and cast net fishermen have been demanding more stringent regulations to control operations of these nets. Clam fishery employs around 150 households. The contractor does not charge any fee for clam fishing. The access is free to local fishing communities as removal of clam from the bottom of kappu improves quality of the habitat. For local fishermen clam fishing is a part time work, an activity they undertake after they complete their routine fishing activity in the kappu. On an average, clam fishing provides a daily income of Rs.50 and brings great relief to many households in the area. As a result, kappu fishermen defend their rights to this resource and prevent entry of other communities from accessing clam beds in the kappu. Hand picking (Thappidutham) provides access to women to these fishing grounds. Local women consider this as their privilege and right to livelihood **(Thomson, 2004)**<sup>14</sup>. However, access to kappu is regulated by charging a fee of Rs. 3 per day. The interviews revealed that women get around Rs. 50 per day for around 150 days in this activity. Chinese net is an important gear used in the poyil and 43 Chinese nets are operating in Kappu. Of these, 36 nets have license and 7

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<sup>14</sup> Thappidutham practiced in the kappu is another version of the kalakkipidutham followed in the nearby areas. Women rights to kayal resources were traditionally recognized by granting them access to prawn filtration farms as soon as the paddy is harvested. See Thomson (2004) for details. Basically this is the right given by the owner, to the village women, to catch fish from the prawn filtration grounds after the prawn filtration is over. This practice has extended the pozhil resources in the very old days itself.

possess pattayam<sup>15</sup>. 150 families depend on this mode of fishing for their livelihood directly or indirectly. The income from Chinese nets is estimated to be Rs. 300 and is shared equally by workers and owners/partners. Seine net fisheries were very popular in the past. A fishery that once engaged around 100 households employs only 10 fishermen today. This technique is exclusive to the Deewara community who take passes from the contractor by paying Rs. 10 /month to get access to the Kappu. Table 2 summarizes the catch, earnings and income earned by various groups from the poyil during the survey year, 2003.

**Table 2 Catch, revenue and income from fishing and other activities in Cherai poyil**

| Gear groups                   | Number of households  | Catch (kg.) | Revenue (Rs) | Number of days employed | Annual per capita income |
|-------------------------------|-----------------------|-------------|--------------|-------------------------|--------------------------|
| Stake Net                     | Monopoly of contactor | 23684       | 810125       | 280-310                 | 100,000 to 150,000       |
| Cast net                      | 400                   | 911         | 58415        | 200                     | 32,000                   |
| Gill Net                      | 450                   | 2121        | 115520       | 200                     | 63400                    |
| Clam fishery                  | 150                   | na          | na           | 150                     | 38000                    |
| Thappipidutham (Hand picking) | 1000                  | na          | na           | 100 to 200              | 7500                     |
| Chinese Net<br>43 nets        | 150                   | na          | na           | 100                     | 30000                    |
| Seine Net<br>10 nets          | 120                   | na          | na           | Less than 100           | 12000                    |

<sup>15</sup> Pattayam is the legal title issued by the government to the grantee for the exclusive use of the water body

#### **4 Resource conflicts and conflict management**

A variety of conflicts with regard to the uses and overuse of resources are reported from the Panchayath. Conflicts among various gear groups, between fishers and aquaculture/agriculture households, tourism industry, and transboundary conflicts over sharing water are some of the common conflicts reported from poyil. Conflicts among various gear groups are minimal in the poyil because of the effective management of the fishery by the contractor in association with local communities and Panchayath. Access is regulated, rules are complied, enforcement is cost effective and efficient, and graduated sanctions are immediate, just and appropriate.

Conflicts between cast net fishermen and modern gill net fishermen are resolved by provisioning the territories according to the time of fishing. For instance, cast net operations are allowed in the morning and gill nets have to organize fishing between sunset and sunrise. Since gillnets are more productive, contractor charges 20 percent of the total value of catch as his share and many fishermen refuse to pay this share and under report catches that often lead to conflicts. The workers of the auctioneer cease crafts and gears if entry passes are not taken in advance or catches are under reported. Since fishermen have to pay high fines to get back confiscated assets, very few violate these rules<sup>16</sup>. Local Matsya Thozilai Sangham is also involved in conflict resolution if the parties can not resolve the issue through bilateral negotiations.

Conflicts also occur when communities are not consulted well in advance regarding implementation of crucial changes on modes of management. The conflict between cast net fishermen and the contractor is worth mentioning. Last

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<sup>16</sup> If nets are seized, fishermen have to go to the auctioneer's office and pay the fine he charges. Most often for the gill nets they are charging Rs. 500 in the case of cast nets they will make the concerned party to take pass for one year irrespective of the day in which he is caught. The fine for not taking pass depends on the auctioneer's choice. There were auctioneer who charges up to Rs. 2000. In such case people will forego the net as the fine exceeds the money required to launch a new net.

year the contractor wanted to raise the entry fee of cast net fishermen from Rs.35 per year to Rs.150 and demanded payment in advance. This decision was unilaterally imposed on gear groups and has been totally rejected. Since there was no agreement reached on the issue till date, cast net fishermen did not pay any fee so far.

Although the Panchayath has given a set of written rules to the contractor, he often violates these rules for making more revenue and profits. These violations are detected and penal measures are adopted to curb such incidents. The contractor did not invest any money to strengthen the bunds. Similarly although the Panchayath was responsible to deepen poyil and canals it seldom spent money to maintain lagoon. Such free-riding has led to the degradation of environmental quality of the poyil and local communities have been asking local state to spent money for improving the ecological services of the kappu.

Recently the contractor has given permission to five or six gangs (10 to12 person per gang) to operate adakkamkolli vala, despite strong resistance from local communities. Those who operate adakkamkolli vala have to surrender 40 percent of their produce to the contractor. These nets are operated during night for fishing prawns. These nets are operated by migrant fishermen of neighboring villages are there is always protested from the local fishermen with the contractor for allowing these destructive nets in the poyil.

### ***Conflict management***

The basic advantage of the co management like arrangement practiced in Cherai poyil lies in the ability of the system to resolve conflicts at the lowest level as possible preferably incorporating only those parties directly involved in the dispute. The Panchayath has also constituted a conflict resolution committee consisting of the secretary, three standing committee members, one each from Finance, Development and Service Departments, two opposition party members.



This committee is headed by the President. This committee will join when there is any serious conflict and settle issues. The subsidiarity principle followed in the region is the product of a tacit cooperation between local communities, Panchayath and the contractor. In case of serious difference of opinion, the issue is referred to dominant political parties/community organizations of the region for resolution. These rulings are obeyed by the parties. If the issues still remain unresolved, the parties could approach the court.

## ***5 Limitations and challenges of decentralized cooperative management***

The system of resource allocation and management confronts a variety of challenges today. The influences of fast growing international modern markets have produced mixed responses among various agents involved in the process of governance. For local communities, there are limits to resources and territories. They need assistance and support to benefit from such economic progress. Their primitive technologies and meager economic surpluses keep them away from benefiting from the modern markets and development. Similarly, communities fail to prevent degradation of environmental quality and conserve estuarine biodiversity due to the lack of cross-scale institutional processes and organizational arrangements. Some of these issues are detailed below.

### ***Community failures, resource conflicts and livelihood adaptations***

#### ***(a) Pressure to open up commons***

Since fisheries in Cherai kappu is regulated, there is general feeling that kappu fishermen are relatively wealthy than the rest of the fishing communities around. Therefore, there is a high pressure for getting access to kappu fisheries and being direct users, communities have greater responsibility to maintain resources sustainable. Most often, this is not possible and resource conflicts do arise in the

management of fisheries. First of all the communities' voices in granting entry to various kinds of gears into poyil fisheries are not heard by the contractor. Despite resistance from cast net fishers and others, the contractor has granted permits to the uses of a particular kind of gill net called disco net/ vaisali net / Adakkam Kolly vala in the kappu. Since these operators pay high entry fee, sometimes even as high as 40 percent of the total catch as share, the contractor yields to such pressures negating the legitimate rights of other traditional fishermen.

Second, there are even compulsions from Panchayath to accommodate more fishermen into kappu fisheries. Although there were strong communitarian restrictions for granting access to outsiders, especially the marine coastal fishermen, by early 1990's the communities surrendered to the external demands of Panchayath leaders and granted access to a local marine fishing community rights to fish in the kappu. In 1995, a few coastal fishermen approached the local Panchayath through their councilor seeking permission to grant fishing rights in the kappu. Cast net operators severely objected to this move and rejected their demand. They argued that granting access to outsiders would reduce catches of the cast net fishermen and increase their economic vulnerability. They even pointed out that the net for which permission is sought are a highly destructive and the application of these nets especially during night damage resources. Moreover, since the water is highly disturbed even during nights, the inflow of prawns and other high valued fin fishes may not enter into the kappu. These arguments were not acceptable to the local Panchayath as the coastal fishers constituted a solid vote bank and the political costs of dismissing their demand for access to fishing in the water body were very high. The contractor also supported the panchayth as such a move would increase his income from fees. Finally Panchayath decided to grant access to coastal fishermen to operate their gill net (pattum vala) for three months. According to this new settlement, cast net fishers can fish during the day and gill netters can fish during night.

**(b) Failure to regulate externalities**

Third, kappu communities also fail to prevent destructive activities undertaken by other users and the costs associated with these externalities. For instance, local aquaculture farms pollute the kappu by constantly changing the water using water in the poyil while all the sediments and pollutants from these farms are being flushed into the kappu. During harvests they even poison farms to collect all prawns and the water released from these farms pollute kappu. Despite repeated requests, no progress has been achieved to regulate environmental pollution in the kappu.

**(c) Development of private property**

More alarming is the inability of local communities to resist the development of private property for the development of aquaculture farms and the misuse of water body to increase short run profits of a few land owners. The development of private property in the poyil dates back to 1972. It may be noted from map that the area shaded yellow was once part of the poyil and has now been privatized by aquaculture farmers. These farms have not only introduced a new economic activity into poyil but also reduced the ecological services to the rest of the communities towards the tail end of the poyil. For instance, fishermen complaint that development of these farms and construction of bunds have reduced the flow of water from the bar-mouth into the poyil that further reduced the availability of shrimp seeds juvenile fishes into the poyil. Reduced flow has resulted finally in accumulation of mud and sediments and has reduced the capacity of poyil to hold water. With the development of private property, three forms of property institutions, state property, individual private property and common property, coexist within the geographical boundaries of Pallippuram Panchayath.

Although economic complexities are negotiated by various producer associations, governance agencies and private entrepreneurs, it is unfortunate to observe that local communities always become the victims of these developments. There are many reasons for the subordination of local communities in the process of negotiations. First, the development of private property necessary for the growth of modern activities like aquaculture and tourism has challenged community's capacity to manage poyil fisheries. Second, modern activities generate externalities by destroying ecological sustainability and ecosystem services. Moreover, environmental costs of modern activities are not internalized or abated by respective modern producer groups and local communities are forced to bear these costs. All these factors further escalate their economic vulnerability in significant proportions.

## **6 Conclusion**

The Cherai model of cooperative resource governance is a unique arrangement by which local governments accepted the role of communities in resource management and provided more space for their activities and initiatives in the management of lagoon fisheries in Kerala. This cooperative management endeavor has a long history and has undergone a series of stress and shocks during the post independent period. The system has endured these shocks and continues to provide services to local communities. This was made possible due to the timely restructuring of the system in tune with the changing forces of modernization and external pressures. The choice of an external contractor to lead the management functions and the regulatory regimes adopted by him in consultation with local Panchayath and traditional fishing communities were effective enough to deliver prudent and just distribution of resources and resource sustainability. Gender sensitive institutions that granted access to local women ensured their livelihood rights and provided more space to women in the sharing of modern benefits of development. The roles played by various participating agents in the management regime are complementary and mutually

supportive. Communities cooperated with local Panchayath and private contractor and assisted them in all possible manners. Monitoring and enforcements are organized by the contractor with the help of local communities and that reduced transaction costs of policing commons. Such surveillance maintained transparency, accountability effectiveness in the delivery of management functions that sustained resources and livelihoods of participating communities. The decentralized political processes and their institutions strengthened cooperative management coalition and fastened the decision making processes. However, the system is not without limitations. For instance its capacity to regulate and control the overall degradation of estuarine environment and market shocks is extremely weak. This would require more broad based cross scale organizational and institutional arrangements than what is currently at place. Despite these limitations, the system of management as witnessed in Cherai fisheries stands out as a role model that should guide natural resource governance in Kerala.

### ***References***

Agarwal A, and C Gibson., 1999, "Community and conservation: Beyond enchantment and disenchantment "World Development 27 (4):629-649

Baland J., and J. Platteau., 1996, "Halting degradation of natural resources: Is there a role for rural communities? ", Oxford, Eng. Clarendon Press.

Berkes, F., 2003, "Alternatives to Conventional Management: Lessons from Small- scale Fisheries.", *Environments* 31 (1):5-19

Jentoff,S.,2000, " The community a missing link of fisheries management" , *Marine Policy* , 24(2000)53-59

Kurup, B. M. 1982. "Studies on the Systematic and Biology of Fishes of the Vembanad Lake" Ph.D. Thesis, Cochin University.

Ostrom, E.,1990. "Governing the Commons: The Evolution of Institutions for Collective Action", Cambridge, New York and Melbourne: Cambridge University Press.

Ostrom. E, Dietz .T, Dolsak .N, Stern .P. C, Susan. S, Weber .E.U. (ed.), 2002, "The Drama of the Commons", Washington DC, National Academy Press.

Thomson,K.T.,2003, "Economic and Social Management of Estuarine Biodiversity Management in India. " ,Report submitted to the Environment Economic Research Committee of Indira Gandhi Institute for Development Research, Mumbai, under the EMCaB Project of the Ministry of Environment and Forestry,Govt. of India.

Thomson,K.T.,2004, "Traditional Costal Zone Institutions and Survival Securities :a case study of an estuarine ecosystem in Kerala." ,Paper presented at the International Conference on Folklore and Legal Pluralism. Fredericton, Canada.

Thomson,K.T and Berkes,F, 2006 "The role of public-private cooperation in the management of estuaries in South India" Technical report submitted to Shstri Indo Canadian Institute, Delhi