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From Community-Based to Co-Management: Improvement or Deterioration in Fisheries Governance in the Cherai Poyil Fishery in the Cochin Estuary, Kerala, India?

Abstract

During the last 50 years, several different forms of fisheries governance have been tried and failed in the Cochin Estuary, Kerala, India. The latest shift has been from a community-based system to a co-management system, and this paper evaluates the current system in the light of the theoretical debate over the respective merits of community management and co-management. The paper is based on documentary material and data from interviews carried out during fieldwork in 2004, from which it concludes that provided the co-management system incorporates community principles within it, it will be an effective form of fisheries governance.

Keywords: community-based fisheries management; co-management; Cherai Poyil fishery, Kerala

1. Introduction

According to Pomeroy and Viswanathan [1], in Southeast Asia there has been ‘a shift from community based fisheries management (CBFM) to co-management and finally to issues of decentralisation’. They state that community-based management of natural resources arose during the 1960s in irrigation programmes, and spread to fisheries during the 1980s [2][3][4][5]. The characteristic feature of CBFM was that it held the government at arm’s length: ‘[It] was people centred and community focussed and often had very little government involvement. CBFM practitioners often viewed government in an external role only to be brought into the activities at a later stage or as needed. This often led to misunderstandings and lack of full support from government for those initiatives [6]. By contrast, co-management, which emerged during the 1990s, focused ‘not only on people and the community but also on a partnership arrangement between government and the local community and resource users. CBFM was then considered an integral part of co-management’ [7]. In other words, co-management did not so much *replace* community-based management as *absorb* it, to form a composite system which Pomeroy and Viswanathan term ‘community-based co-management’ (CBCM). Moreover, CBCM had a wider remit than resource management, extending its reach to such goals as community development and social empowerment. According to Pomeroy and Viswanathan [8], a second change occurred simultaneously – decentralisation: ‘In early 1990s, at about the same time co-management was emerging, there was also a movement in Asia towards decentralisation...the systematic...dispersal of power, authority and responsibility from the central government to lower or local level institutions...even to community associations...in support of government policies...which stressed the need for greater resource user participation and the development of local organizations to handle some aspects of fisheries management’. This entailed state governments handing over fishing rights to local communities, as endorsed by fisheries officials of ASEAN countries at a meeting in Bangkok in 2001 [9].

This paper uses the case study of the Cherai Poyil fishery in the Cochin estuary in Kerala, India to test the hypothesis of Pomeroy & Viswanathan and others (including Allison and Badjeck [10]) that there has been a shift from a community-based system to a broader community-based co-management system, reinforced by devolved powers from the central government, with a wider remit embracing socio-economic goals as well as natural resource management. The paper also seeks to evaluate the success or otherwise of the shift to co-management that has taken place in the management of the Cherai Poyil fishery.

In section 2, the methodology of the research which produced this paper is explained; section 3 outlines the ecological and social context of the Cherai Poyil fishery in the Cochin estuary; in section 4, the three most recent stages of governance of the Cherai Poyil fishery are identified; section 5 focuses on the current system of fishery governance (co-management); in section 6, the strengths and the weaknesses of the current system are discussed; and the concluding section 7 summarises the findings of the paper.

2. Methodology

The paper is based on a study carried out in 2004 which examined the role of public and private interactions in the management of Cochin estuary [11][12]. An interdisciplinary study team of fisheries scientists and social scientists, research scholars and consultants were involved in identifying the major economic activities in the Cochin estuary; conducting detailed frame surveys on various traditional and modern stakeholders; and collecting primary data on the target population, the number of fishing and non-fishing households, the main occupational patterns, and the economic and social organisation of various fisheries (prawn filtration, agriculture and aquaculture). A variety of methods of obtaining data was used, including detailed interviews, livelihood surveys, rapid rural appraisals, and participatory research. During the frame survey, information on the number of fishers operating different kinds of gears in the Poyil was collected, and 59 fishers were interviewed, comprising seven stake netters, four Chinese netters, 10 cast netters, 12 gill netters, two seine netters, eighteen clam fishers, and ten fisherwomen engaged in hand picking. Included in these interviews were surveys of livelihood and economic viability linked to the various gear groups, following the technique devised by Scoones [13]. The fishers interviewed were randomly selected at their respective fishing spots, and followed up subsequently during the period January-December 2004. Interviews were also conducted with ten community, Panchayath and trade union leaders who belonged to the two main political parties – eight from the Marxist Communist Party and two from the Congress Party – focusing particularly on institutional interplay, conflict resolution, gender balance and environmental management.

Records kept in the local Panchayath and the state fisheries department were consulted to verify the authenticity of claims made during interviews, and to provide information on formal and informal institutions, including policy instructions and directives related to decentralisation, resource mobilization, delivery of services, extent of community participation in Poyil administration, institutional partnership arrangements, local community empowerment, the status of women, and the role of civil society in decentralized coastal area management.

3. Ecological and social context of the Cherai Poyil fishery in the Cochin estuary

Cherai Poyil is a 210 hectare brackish water pond located at the extreme north-west opening of the Cochin estuary in Kerala, India (Figure 1).

[Insert Figure 1 here]

The Poyil, which lies within the administrative boundaries of Pallippuram Panchayath, is 6.25 kilometres long, and the fishing territory has a length of 3.67 kilometres and an average depth of 1.2 metres. Tidal functions of the estuary bring a variety of fish into the Poyil, and local communities around the Poyil depend on these fisheries for their livelihoods. The gear used by fishers include Chinese nets, stake nets, cast nets and gill nets, to catch over 70 species of fish and shellfish, most of which are available throughout the year. Apart from fishing, people undertake both aquaculture and agriculture in the wetlands. Traditionally, farmers cultivate paddy rice for the first six months of the year followed by prawn culture for the remaining six months. However, during the last three years, people have abandoned paddy rice cultivation due to its low yield and high labour cost, and converted these lands to culture prawns in aquaculture farms called Varshakkettu. The total area of the Varshakkettu is 65 hectares, containing 16 farms in which semi-intensive of prawn culture is practised.

4. Three stages of governance of the Cherai Poyil fishery

During the last 50 years, the Cherai Poyil fishery has been managed by a succession of three governing systems: state control; community-based management; and co-governance.

4.1 State control

Before the 1950s, there were no formal rules governing the access and use of fisheries within the Cherai Poyil fishery. Fishing, agriculture and prawn filtrations were traditionally organized by local communities according to informally agreed normative and communitarian principles, which meant in practice that fishers were subordinated to the leading agrarian castes. In the 1950s, the state government nationalised the Cherai Poyil fishery as national state property: Poyil fisheries were brought under the direct control of the Cochin-Travancore states, and when the Kerala state was formed in 1956, the administration of Poyil fisheries was taken over by the Kerala State Fisheries Department. The state government took steps to improve the infrastructure of the estuary. For example, to enable agrarian communities to undertake various economic activities on the ecosystem, the channel extending from the Munampam bar mouth to Nayarambalam was developed by local landlords with state government assistance, employing large numbers of people from the local workforce. In addition, the state government constructed a number of canals for draining water from pokkali paddy fields, so that agriculture (pokkali paddy rice and coconut plantations) could provide basic livelihoods for local people, supplemented by fishing and prawn filtration. These interventions had a major impact in transforming the way people in the area earned their living.

The first formal law that regulated access to fishing in this water body came into effect with the national Travancore–Cochin Fisheries Act (1950), which stipulated for the first time that state governments could collect rents/fees from fishermen who fished in water bodies within their administrative boundaries. The Act further ruled that auctions would be held to distribute fishing rights to the highest bidders, and that both individual contractors/associations and fishing community associations or their cooperatives could participate in these auctions. The duration of fishing rights was limited to one year, and lessees would remit their rents directly to the state government fisheries department before commencing fishing: any fishing rent arrears were legally recoverable in the same way as arrears of land revenue. The lessees were legally bound to grant equitable access to different fishing gear groups in the community.

4.2 Community-based management

Despite the economic benefits which state government control had brought to the area, various grievances surfaced against its system of fisheries management. First, fishers thought the state government placed too many restrictions on the use of particular fishing gears, and local fishing communities resisted the restrictive allocations dictated by successful bidders ('contractors'). Second, the system of public auctioning gave an opportunity to private contractors to bid for fishing rights at high rents, which ultimately displaced local communities from management, and made fishers once more subordinate to dominant castes, because the majority of the contractors belonged to the higher castes. Third, contractors unilaterally decided the revenues charged to different gear user groups to whom they sub-leased the fishing rights. In 1955, as a result of their resentment at this situation, representatives from three fishing communities (Vaalán, Kanakkan and Arayan) requested the state government to terminate the leasing system and hand over fishing rights in the area to local community fishers' organizations. Acceding to this request, the state government granted fishing rights to these three local communities for Rs 10,518.75 for one year, which was only one-third of the amount previously auctioned.

For local communities, management of the Poyil fisheries, especially the permitting of access to various gear groups, became their greatest challenge, and to meet it they introduced a number of proposals to control fisheries. These proposals, which were discussed by each of the community fishers' societies, concerned modes/criteria for allocating fishing rights to individuals; the fees to be charged to each gear; the persons to whom fishers would sell their catches; and the mechanisms to resolve conflicts. The proposals were forwarded to the state government department of fisheries for approval, which it granted without requiring many changes. Informal rules enacted as local by-laws would supplement these formal rules, to be adhered to by gear groups and the contractors. To some extent, this system resembled co-management, in that it involved both the state government and the community in decision-making. But the centre of gravity lay firmly in the community: the state government's role was confined to that of formal approval of the proposals made by the Poyil fishing communities. The presence of similar systems in other villages around the estuary has been reported by other scholars, including Lobe and Berkes [14] and Srinivasan [15].

However, community-based management was a short-lived system, because of a series of internal conflicts and related management incompetence due to the fact that

most of the community fishers' organizations were new and did not possess adequate managerial and technical skills to manage resources and finances. Although these organizations received financial assistance from the state government to manage fisheries, they incurred huge financial liabilities, and after three years, the state government liquidated them.

4.3 Co-management

The management system that replaced this brief period of community-based management was co-management – i.e. a sharing of power between local government (Panchayath - the leading force in the partnership) and local communities. Because of the move towards decentralisation by the Kerala state government, by the mid-1960s local authorities (Panchayaths) had become nodal agencies of state government administration and they were searching for opportunities to enhance revenue. Three Panchayaths in the Vypin block - Pallippuram, Kuzhuppilly and Nayarambalam - noted the practice of rents collected from wetlands by the state government, and asked it to transfer to them the ownership rights over purampoke lands and water bodies that lay within their respective administrative limits under the state Panchayath Raj Act (1960: sections 62, 64, 82, 84 &149). But the state government fisheries department was reluctant to hand over these ownership rights to local Panchayaths because such a move would reduce its income from fishing rents. Many private landowners who owned major water channels also objected to the move: as one landowner remarked, “taking over Poyil administration by the Panchayath was not acceptable to us as it reduces our control over water channels and on the fishermen who were granted access on channels under our control”.

The state government fisheries department filed an appeal against the provisions of the Act, and the hearing went on until 1967, when the case was resolved in favour of the Pallippuram Panchayath, and after long negotiations, the state government eventually accepted the proposals of all three Panchayaths. Hence the Cherai Poyil fishery was taken over by the Pallipuram Panchayath, which in March 1968 conducted its first auction of fishing rights. However, because fishers' groups did not have sufficient financial resources to lease and manage the fishery, the Panchayath was forced to lease out management rights to private entrepreneurs. But local fishing communities objected to this private contracting, and demanded a greater role for registered fishers' organizations, of which there were 19 at that time. One of the leaders of the Vala fishing caste remarked during an interview: “We, along with the Arayas, organised protest marches and hunger strikes in front of the Panchayath office, and even threatened to withdraw one of our representatives from the Panchayath council if our demands were not met. Finally they agreed”. After protracted negotiations, the Panchayath decided to lease out the fisheries to the fishers' organisations, albeit at a fee that was 100 rupees higher than the amount bid by private contractors. Nevertheless, local government, in the shape of the Panchayath, remained firmly in the driving seat.

5. The present system of fisheries governance

Section 4.3 describes the system of fisheries governance in the Cherai Poyil fishery which remains broadly in place today. It consists of two elements: local government (the Panchayath), which is the major player; and the local community, the minor

player, each of which serves its own interest by participating in the partnership. The Panchayath benefits from revenue derived by leasing the fisheries to the fishers' organisations; the local community (which includes the fishers' organisations) benefits from the security of settled fishing rights and from being protected from subordination to the higher castes, by the leasing arrangements. The Panchayath learned from past experience of the state government that direct top-down, day-to-day supervision of fisheries by government was expensive and time-consuming, and that the cooperation of the community was essential to ensure more effective governance. For its part, the communities recognized that community-based governance was not feasible because of lack of fishers' skills to navigate the complexities of modern fisheries management.

5.1 Role of the Panchayath

The role of decentralised institutions in natural resources management has been highlighted by many scholars [16][17][18][19][20]. In the Cherai Poyil fishery, the topmost authority is the Panchayath which leases out the water body to the contractor who in turn allocates fishing rights to various gear groups, including women. This lease, however, is subject to a set of rules and regulations regarding the use of different fishing methods, type of gears, and mesh size regulation. When the contractor executes contract, the Panchayath hands over a written set of rules to direct fishing activities during the tenure, and the contractor has to follow them to the letter. Some of these rules are detailed restrictions relating to particular features of the fishery, such as the proper distance between stake nets, and the prohibition on trammel fishing after the monsoon season. Other rules are more general, such as arrangements to be made for inspection of canals by officials of the state government fisheries department, and directions to the contractor for organizing his/her activities without obstructing the activities of other stakeholders. Under the previous community-based management regime, most decision-making rights were vested with local cast communities, but under the new regime, subject to the above rules, such decisions are typically made by the contractor, largely without consulting local communities.

Nevertheless, in the rules governing access to the fishery, and the rates of fees charged to fishers for using different types of gear, three principles of good governance can be observed – equity; customary rights; and environmental stewardship. The principle of equity is seen in the fact that fee rates are not set arbitrarily by the contractor alone, but in the presence of nominees from the Panchayath and in consultation with the different gear groups who seek access to the fishery. Moreover, the rates are proportional to the catch rates of respective gears. The principle of customary rights is seen in the fact that since cast net fishers retain customary rights on the Poyil, they are allowed to fish early in the morning, and are charged only a nominal fee by the contractor as a token of acknowledging their traditional rights. The principle of environmental stewardship is seen in the fact that women are allowed to extract the clam beds located along the western part of the Poyil and no fee is charged, because removing clams improves the quality of habitat and increase fishing activities in the Poyil.

However, although these principles are sensitive to the requirements of local communities (gear groups) and women, the contractor often violates them, thereby

causing conflicts to occur. For example, despite local resistance, the contractor granted fishing permits to a new generation of gill nets (disco net/vaisali net/Adakkam Kolly vala) into the Poyil. By charging high rents (40% of the total catch), the contractor yielded to such pressures, despite negating the legitimate rights of other traditional fishermen. Similarly, under the influence of local Panchayath, the contractor granted access to a group of local marine fishermen into the Poyil. Fishing activities of these entrants led to the reduction of catches of cast net fishermen. Finally the contractor did not support the community's struggles against the aquaculture lobby which polluted the water body, because a confrontation with that lobby could have weakened his power base.

On the issue of enforcement of the rules, we should distinguish between the contractor enforcing rules on fishers, and the Panchayath enforcing rules on the contractor. The contractor is assiduous in enforcing rules on fishers to whom he allocates fishing rights, employing 12 workers as enforcers. These enforcers issue passes to other fishermen, collect fees and fines, and guard the fishery by checking for illicit or banned fishing gears and trespassing. If violations are detected, they seize crafts and gears of trespassers and release them only after collecting the appropriate fines. Since the monitoring team is vigilant, few fishers violate the rules. Monitoring cast net fishers has never been a major problem for the enforcement team as they are all local people who fish in the morning and are well-known personally to the enforcers. In the case of outsiders, monitoring is more difficult, because they fish during the night and leave before the enforcement team arrives to fix the stake nets. However, surprise checks are often made, and unauthorised fishing is detected. During the survey year (2004) the fines collected by the contractor amounted to Rs. 38,000, as reported by one of the members of the enforcement team.

By contrast, the Panchayath's enforcement of rules on the contractor is low-keyed. As the owner of the Cherai Poyil fisheries, the Panchayath has a duty to ensure that the gear groups and the leaseholder comply with legal codes and regulations passed by both the central and state governments. But the Panchayath has been criticised by central government agencies for transferring that responsibility to the contractor rather than enforcing them itself, because of high transaction costs. The fact is that the Panchayath has adopted an informal approach, preferring a policy of political lobbying, community participation, and negotiation to a heavy-handed coercion. For instance, there are contentious issues between the Panchayath and the coastal regulation zone (CRZ) management authority regarding the implementation of CRZ rules within village limits. Instead of implementing these rules comprehensively, the Panchayath has been negotiating exceptions for the benefit of local communities. This indicates that the Panchayath prefers the role of consensus-building to the role of confrontation. We can see this preference in its self-appointed role of honest broker, when it intervenes to resolve conflicts between communities and contractors and/or other government departments. It has constituted a committee for this purpose which examines conflicts in detail and suggests alternative solutions to avoid the matter being referred to the legal system for resolution. This negotiated style of governance works well to resolve resource conflicts between the contractor and the fishing communities, but there are limitations on its use in other situations, such as when the contractor is the violator of the rules.

5.2 Role of the community

Although the community is the junior party in the co-management partnership, its role is very important in giving general support to the Panchayath's efforts to bring social order, justice and efficiency into the system. Also, local communities play a significant environmental role by working to maintain the ecological stability and healthy quality of the water body, which is crucial for the sustainability of the fisheries on which they all rely. There have been many instances where communities resisted the economic activities of modern entrants who over-used resources and polluted the water body (although the communities' capacity to resist such efforts has been eroded considerably in recent years). For instance, fishing communities defeated a proposal put forward by the Panchayath and the Fisheries Department to convert the Poyil into a fish sanctuary, because they feared that the project was an attempt to commercialize the local water body for the tourism lobby which would have reduced the productivity of the Poyil and ruined many fishers' livelihoods. Another example was the action of fishers to stop the practice of extracting juvenile and fry prawns (*Penaeus indicus* (white prawn) and *Penaeus monodon* (Tiger prawn)) from the Poyil to sell to private aquaculture farmers. Fishers noted that such extractions sharply reduced the overall productivity of Poyil fisheries and their own catches: for instance, a cast net fishermen remarked that "We do not get enough prawns nowadays due to the incoming of the aquaculture farm near the bar mouth and also due to unauthorised fry collection from the Poyil...We have to ban these". As the matter involved local communities, the issue was referred to the local Panchayath, and as a result of its involvement, the practice of juvenile prawn fishing was banned in the Poyil.

6. Appraisal of co-management in Cochin Poyil fishery

The current system of co-management in the Cochia Poyil fishery has both strengths and weaknesses.

6.1 Strengths

Of the four main strengths of the co-management system, the most important is the economic security it has brought fishers and their families. There was a general feeling among interviewees that the living standards of the Cochin Poyil fishermen have improved under the co-management regime, and are better than for the other fishing communities in the estuary. Table 1 shows the distribution of fishing effort, employment and earnings of communities fishing in Cherai Poyil, compared to those who fish in the nearby stations outside the Poyil.

[Insert Table 1 here]

The table clearly demonstrates that communities fishing in Cherai poyil have an economic advantage over communities fishing in the nearby stations in the Cochin estuary. They exert a lower fishing effort than the other communities; their number of fishing days is greater; and their daily earnings are much higher.

Second, co-management has brought an effective means of conflict resolution to the fishery. Indeed, a basic advantage of the decentralised co-management arrangement practised in Cherai Poyil lies in the ability of the system to resolve conflicts at the lowest level possible, incorporating only those parties directly involved in the dispute

[22][23]. This subsidiarity principle followed in the region is the product of tacit cooperation between local communities, the Panchayath, and the contractor. It has two elements, preventive and resolute. The preventive element is the attempt to anticipate sources of tension before they arise. Since conflicts can occur when communities are not consulted well in advance regarding implementation of crucial changes on modes of management, the co-management system is careful to carry out such prior consultations. Furthermore, conflicts between various gear groups are minimised in the Poyil by regulating access, partitioning territories, and reserving specific timings for competing gear groups. For instance, cast net operations are conducted in the morning, while gill nets have to organize fishing between sunset and sunrise. The resolute element lies in the procedures devised for solving the conflicts that do arise, including conflicts over the use and overuse of resources; conflicts between various gear groups; conflicts between fishers/aquaculturalists and the tourism industry; and trans-boundary conflicts over sharing water. To deal with such problems, the Panchayath has constituted a conflict resolution committee consisting of the president, the secretary, three standing committee members from the finance, development and service departments, and two opposition party members. In case of serious differences of opinion over decision-making, the issues are referred to the main political parties/community organizations of the region for resolution, and these rulings are generally obeyed by all concerned. If the issues still remain unresolved, the parties can approach the courts, though none of the grievances have so far gone to the formal courts for resolution, since the parties know well that such steps are very time-consuming.

Third, co-management has improved the enforcement of regulations in the Cochin Poyil fishery. The enforcement team of the Panchayath undertakes routine patrolling, and seizes crafts and gears if entry passes are not held or catches are under-reported. Since fishers have to pay high fines to get back these confiscated assets, very few violate these rules. The fine for not having an entry pass can be up to Rs. 2000, and recovery of gear such as gill nets can cost Rs. 500, a fine that exceeds the cost of buying a new net.

Fourth, co-management has formally endorsed the fishing rights of women. Women's rights to estuarine resources have been legally recognized by granting them access to prawn filtration farms as soon as the paddy rice is harvested, a process known locally as kalakkippidutham. Hand-picking (Thappidutham) is another form of enforcing women's rights in fishing grounds and provides them with decent livelihoods. Access to the fishing grounds is regulated by a fee of Rs. 3 per day, and women earn around Rs. 50 per day for 150 days pa from this activity.

6.2 Weaknesses

Despite the above strengths, there are three main weaknesses in the co-management system in the Cochin Poyil fishery. First, violations of the regulations by the contractor are not rigorously addressed by the Panchayath. Indeed, strict enforcement is really only on paper, because in practice, the Panchayath sees the contractor as a major source of revenue, and therefore yields to whatever he/she dictates in the Poyil administration, provided that his/her decisions do not generate serious conflicts in the Panchayath. There are even allegations that members of the governing bodies of the political parties are financially compensated by the contractor to persuade them not to

impose exacting strict penalties on the contractor. Moreover, there is little guarantee that the Panchayath will fulfil its own obligations. For instance, although the Panchayath is responsible for the deepening of canals to maintain the health of the lagoon, it has seldom spent money to carry out this duty. This failure has led to the degradation of the environmental quality of the Poyil, and local communities have had to ask the state government to invest money to reverse this deterioration.

Second, the system has not sufficiently contained the volume of new entrants into the fishery. Since access to the Cherai Poyil fishery is now subject to formal regulation, the communities could overcome the tragedy of commons, but there was considerable pressure to allow access to fishers from other communities, and as the system of governance had shifted from community-based co-management to contractor led co-management, the community's wish to deny entry to outsiders did not prevail. In 1995, a few coastal fishermen approached the local Panchayath through their councillor seeking fishing rights in the Cherai Poyil fishery. Cast net operators strongly objected to this move, arguing that granting access to outsiders would reduce catches in cast nets and increase their economic vulnerability. They also pointed out that the type of net for which permission was being sought was highly destructive, and the use of these nets especially during night fishing would damage the natural resources of the fishery as well as reduce the inflow of prawns and other high-value fin fishes. However, these arguments were rejected by the local Panchayath, because 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 Panchayath granted access to coastal fishermen to operate their gill net (pattum vala) for three months: cast net fishers could fish during the day while gill netters could fish during the night. In addition, as we noted in section 5.1, despite resistance from local fishing communities, the contractor also granted permits to marine fishers to operate the disco net/vaisali net/Adakkam Kolly vala in the Cherai Poyil fishery, because these operators paid a high entry fee.

The third weakness of co-management in this fishery is that it has allowed the principle of private property in aquaculture to over-develop shrimp production at the expense of the quality of the water body. Despite the resistance mounted by local communities to the extension of private property to aquaculture farms, and the consequent misuse of the water body by a few landlords to increase their short-term profits, aquaculture farms have lowered the quality of the ecological services and tidal functions to local communities, especially around the tail end of the Poyil. For instance, fishers vainly complained that the development of farms and consequent construction of bunds has reduced the flow of water from the bar-mouth, thereby diminishing the availability of shrimp seeds and juvenile fishes into the Poyil and increasing the accumulation of mud and sediments which has further reduced the capacity of the Poyil to hold water. Moreover, local aquaculture farms have continued to pollute the water body by constantly flushing sediments and pollutants into it. During harvests they even use poison to collect all the prawns, and the water released from these farms adds a toxic ingredient to the water body. Despite repeated requests, no progress has been achieved in regulating such environmental pollution. This situation is symptomatic of the fact that co-management has failed to regulate externalities in general: the Panchayath has not succeeded in preventing destructive activities of other users, the costs of which have escalated in recent years.

7. Conclusion

The Cherai Poyil system of co-management is one in which local government has accepted the role of the local community as a junior partner in resource management and provided space for its activities and initiatives in the management of lagoon fisheries in Kerala. To some extent, it conforms to the hypothesis of Pomeroy & Viswanathan and others of a shift from a community-based system to a broader community-based co-management system, reinforced by devolved powers from the central government, with a wider remit embracing socio-economic goals as well as natural resource management. It has grounded fishers' rights – including women's rights - in a stable framework which provides sustainable livelihoods for families reliant on fisheries. It has also formalised an institutional structure for resolving conflicts between groups in the community and for increasing the effectiveness of enforcement of the regulations. However, its relaxed style of governance, relying more on negotiation than on confrontation, and its susceptibility to political pressures, has meant that it has not dealt effectively with the triple problems of the corrupting influence of money; the tragedy of the commons; and the externalities of water pollution. If the balance of power in the co-governance system between the local government and the local community were to shift towards a more equal share for the community, these problems might be more resolutely addressed.

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