

Collaborative Estuarine Management: A Study on Cochin Estuary

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This paper provides basic information for guiding the task of managing estuaries in South India at different levels of public and private partnership using the insights drawn from primary studies on the dynamics of various resource management practices in selected fishing villages. The necessary data were collected during 2004-05 using frame surveys, participatory research methodologies and structured questionnaires. The study revealed that the management practices in the study villages exhibited a blend of both informal (community-based) and formal (state-centric hierarchical) governance. Collaborative management practices replaced community-based and state-centric management strategies, produced cooperative solutions to resource crisis and livelihood vulnerability of traditional fishing communities. The study also confirmed the active presence of decentralised collaborative fisheries management systems under certain situations. The analysis revealed that, since complex multiple commons like estuaries are not easily predictable, traditional knowledge systems and practices should be recognized as baseline information for building institutions and resource management policies.

Key words : Estuarine co-management, Fisheries co-management, Decentralized governance, Sustainable livelihood, Public-private partnership.

Management of natural resources and environmental services of estuarine ecosystem is a challenge to policy makers and local communities in transitional economies. Lack of proper assistance and directions from the State has led to the failure of management of local institutions. The decline of *Paadu* systems in South Indian lagoons and *Kadakkodi* system in marine fisheries are classic examples of such failures (Lobe and Berkes, 2004; Srinivasan, 2005; Paul, 2005). When natural resource endowments are opened to forces of international markets, communitarian management methods fail to coordinate economic activities. Management initiatives from the Centre implemented by the state were rejected by local communities due to lack of fairness in resource distribution, environmental destructions, gender

inequalities and overall livelihood/food insecurities in rural areas. Development initiatives aimed at increasing the potential for increased fishing activity on selected species to promote economic efficiency and production (Kurien, 1998; Allison and Ellis, 2001) often makes the decision-making and governance highly complex, dynamic and diverse. The centralized governance system had effectively excluded a significant proportion of primary producers in the fishing industry from the decision making process (Hatchard, 2005).

The limitations of such "either or" principle of resource management armoured a partnership between the State and communities as an immediate solution to resource crisis and sustainable livelihoods (Berkes

and Folke, 1998; Pinkerton, 1989; Pomoroy and Gueib, 2006; Thomson and Berkes, 2006). Partnerships frequently resulted in shared governance, collaboration, and collective ownership in defining needs and finding solutions (Thomson and Berkes, 2006). This approach, popularly known as co-management, means that the government agencies and local communities share responsibility for resource management (Jentoft, 1989; Berkes and Folke, 1998). To be effective and efficient, co management has to be a relationship where state formally recognizes local communities as partners of a management agency which designs strategies and sanctions for the smooth functioning of collaborative management.

This paper provides some basic insights about management alternatives under various levels of public and private partnership in the Cochin estuary with the help of three case studies. The first case study examined how clam-fishing communities in Perumbalam Island, aligned with neighbouring communities objected state policies and its top-down management interventions that infringed their traditional customary rights over clam fisheries. The second case study examined how two neighbouring fishing communities in Aroor-Arookutty villages failed to manage stake net fisheries due to their non cooperative behaviour for conflict resolution. The final case study explored how local fishing communities in the Cherai Poyil evolved collaborative management practices with local state and private agents to manage fisheries. The paper adopted an inclusive approach and wider canvas of co-management to examine how communities responded to markets and state sponsored development initiatives. The paper is meant for policy makers, administrators, scientists and researchers engaged in estuarine resource management.

Understanding socio-ecological interactions on estuaries in a globalizing world: Case studies and framework for analysis

The coordination of economic activities over the uses of estuarine resources was characterized by high degree of complexity, dynamics and diversity in various social and ecosystem relationships (Thomson and Berkes 2006). Therefore, management of estuarine resources and ecological services highly depends on socio-economic structure of local communities, the state, private sector and civil society and embraced mechanisms and processes. Fig. 1 shows the conceptual framework used in this study to describe the evolution, existence, structure and functions of various modes of resource uses and social interactions within and among local communities, industrial enterprises and state. The framework clearly indicates to the plausible management coalitions that could evolve from these interactions based on the nature of cooperation and conflicts among various social actors.

Materials and methods

The study used a check list of questions to facilitate comparative analysis of how local communities at various study locations responded to modern markets and state policies to manage resources and livelihood. As a first step, rapid rural appraisals, frame surveys and participatory rural appraisals (PRA) were conducted to throw light on the ecological, socio-economic and the history of resource management systems prevailed in each of the case study locations. Formal surveys followed to obtain individual household level data particularly on the social organisation of various economic activities. 150 in-depth interviews, covering not less than eight percent of the target population in all the case study villages, were conducted randomly to collect information on livelihood, management practices

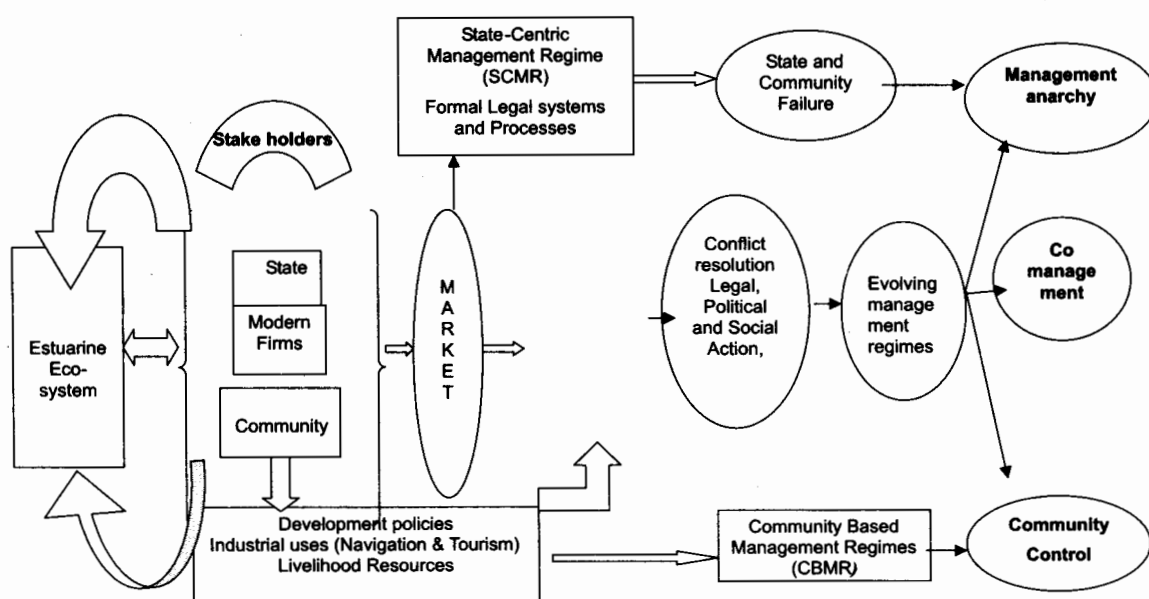


Fig. 1. Public-private interactions and plausible estuarine management regimes: A Conceptual framework

and resource conflicts. PRA methodologies were executed in each of the case study villages to study the traditional knowledge systems, local institutional arrangements and the roles of social, human, financial and natural capital on local livelihood. A range of different methods like focus group discussions with fishermen using different gears, agriculture/aquaculture workers and key informant interviews among various groups were also conducted to collect information on social conflicts and community response towards the present system of governance. Participatory mapping methods were applied to develop resource maps and to elicit the basic understanding of the present and past geographical settings of the study area.

Results and Discussion

Case study 1

Since time immemorial, clam fishing and processing of clamshells were the primary sources of livelihood of rural communities around Cochin estuary (Lakshmilatha and Appukkuttan, 2002) which was also a major source of raw

material for various cement, paint, fertilizers and chemical industries in Kerala and Tamilnadu. During the sixties, the demand for clamshells increased many fold and local communities could not supply such large quantities required for industrial processing. As the custodian of minor minerals, state relocated mining rights on traditional clam beds used by village communities to a public sector enterprise, Travancor Cements Limited, (TCL), which by resorting to mechanized dredging for collecting clamshells damaged traditional production systems and livelihood. Although local communities did not question the rights of the state to transfer clam resources to industries, they pointed out that such forced transfers ruined their livelihoods and many useful ecological services necessary for the sustenance of estuarine ecosystems. Village communities' resisted state sponsored development initiatives and defended their customary rights to secure livelihoods. Although the state withdrew initially from enforcing transfer of lease rights, it fought back strongly with the help of a technical report favouring mechanized dredging (Ravindran et.al., 2006). In the process of these violent exchanges with

local communities, the state consciously rejected the possibilities for evolving joint fisheries management for sustaining community livelihood.

That loss of community's trust on state's authority and management strategies generated many divergent patterns of resource management. First, local communities challenged state laws and authority and reorganized their practices to sustain livelihood. As part of that exercise, they lobbied local, district and state level politicians, in their capacity as '*rule crafting agents*', to support their agitations for livelihood rights. They also resorted to political lobbying to delay the implementation of formal state laws. Second, they approached courts for adjudication. Third, they even aligned with progressive civil society movements to press for their legitimate claims for better living and livelihood rights, although substantial benefits were not attained from such interventions (Thomson, 2007). The study reminded the need to strike a balance between commercial and livelihood uses of natural resources. State sponsored management directives were discarded by local communities of Perumbalam for want of fairness and equity.

Case study 2

Dheevera communities of Aroor and Arookutty villages in the Cochin estuary have been traditionally managing estuarine stake net fisheries using indigenous institutions popularly known as the *paadu* system (Lobe and Berkes, 2004; Thomson, 2003). Community organizations controlled access to stake net fishing grounds through a variety of informal institutions (Thomson and Berkes, 2006). These rules enabled them to regulate access to fishing grounds and ensured fair distribution of resources. The development of international markets during the seventies prompted them to violate these

traditional resource-sharing practices, as these rules could not offer enough incentives to various gear groups for maximizing economic profit. Many individual fishing households fixed additional stake nets, mostly illegal, into *paadu* lines in an attempt to increase profit. An illegal *paadu* was formed by Arookutty fishermen and contradicted the economic interests of fishermen in Aroor. The number of illegal stake nets increased further due to growth in population and weak community-based management institutions. As the "*weak community*" could not regulate access and distribution of resources, individual members intensified their fishing effort further leading to livelihood vulnerabilities and environmental degradation.

Based on expert scientific studies, the Kerala Government enforced rules that sidelined livelihood considerations and cost benefit calculations. Local communities discarded many of these rules and reformulated few others through various socio-economic adaptations. Realizing that the enforcement of formal rules was very costly, the state on the other hand, resorted to selective enforcement which was not sufficient to ensure resource health and livelihood security of primary producers. Attempts of the state to liberalize the estuarine economy aggravated the ecological and economic crisis further in recent years and the communities resorted to violent means to protect their livelihood and economic rights.

Communities in both the villages, did not cooperate with the State, due to non-delivery of prompt management services. There was a feeling among local communities that recent development policies and promotional activities of the state did not encompass them due to social backwardness, lack of financial capital, education and skills. Also the State did not make any serious efforts to mitigate the negative impacts of

modern activities on traditional production systems. In fact, environmental externalities increased many fold to the extent of degrading biological resources and affecting livelihood of local communities (Thomson, 2002). Consequently, what prevailed in the Aroor-Arookutty region today was an absence of a management authority to regulate stake net fishing by resolving inter-community conflicts by sustaining local livelihood and environment. The anarchy of management systems has been the product of state and community inaction to evolve informal cooperative solutions to balance economic opportunities, environmental degradation and livelihoods (Thomson, 2008). Hence the challenge to bring up sustainable development seems to be moving away from 'state or market' to 'state with market'. The study emphasized that neither state nor market alone could bring about the desired changes; if state led intervention has failed, so will stateless intervention (Drez and Sen, 1995). The state and communities should therefore explore the possibilities of collaborative problem solving methods to resolve the major issues facing the economy. Unfortunately, no novel initiatives are on card.

Case study 3

Cherai *Poyil* is a brackish water lagoon located at the extreme north-west opening of Cochin estuary with an area of 210 hectares. The enclosed water body sustains a diverse and vibrant fishery. Fishing communities in the Cherai region were the first group that cooperated with private entrepreneurs and local state to evolve a co-management like arrangement to control and manage their fisheries, aquaculture, prawn filtration and agriculture. Although, *Poyil* was the property of the local state, it recognized fishermen's use rights. Activities like fishing, agriculture and prawn filtrations were organized according to locally agreed normative and communitarian principles. Fishermen

fished in the *poyil*, farmers cultivated paddy and cultured prawn on rotational basis using water from the *Poyil*. This crop rotation in fact sustained the ecological and socio-economic balance in these areas even though they were faced with problems of low yield and high labour cost.

Five decades ago, fisheries of Cherai *poyil* were managed by local fishing communities. Neither fish traders nor local state were ever interested in resource management. When international markets for fish and prawns developed around mid sixties, the local Panchayath granted exclusive fishing rights to local fisher organizations. This proposal was challenged by the Fisheries Department and the legal battle was resolved in favour of the local Panchayath. Unfortunately, traditional fisher organizations could manage fisheries only for three years and they handed the administration back to the Panchayath. To revive the management system, during early seventies, the Panchayath introduced an auction system to lease out *Poyil* fisheries. Local fish traders auctioned these rights and reorganized *Poyil* fisheries by introducing regulations to various fishing groups. According to the new arrangements, contractor could fish for prawns at strategic locations while other gear groups were to concentrate on other fisheries after taking a formal permission from the contractor. Informal institutions that governed local fisheries were complied by all concerned and violations were sanctioned immediately. This new management system performed like a co-management arrangement where the responsibility is shared by local self government, fishing communities, local trade unions and a private investing agent. Local government crafted management rules after consulting fishing communities and the contractor. The contractor imposed entry fees to various fishermen groups and purchased all high valued fishes from them. A core team

consisting of members from a local trade union patrolled fishing territories, and enforced sanctions and fines on those who violated local rules. Fishing communities also carried out community policing and informed local government if any one violated management rules. In other words, fishing was controlled by merchants with the help of fisher groups and local Panchayath. Despite limitations, the system is still active in Cherai poyil fisheries (Thomson and Gray 2009). The study shows that local stakeholders with the help of political institutions can effectively control and manage fishing, aquaculture, filtration and agriculture in this region.

The cases illustrated above points out how management regimes swing depending upon the manner in which state-community-private enterprises interact in various production activities that draw resources and environmental assets from estuaries. The general faith on top-down bureaucratic systems of governance to effectively manage complex commons is not empirically supported in this study. As the approach has limitations, it should be restructured to an ecosystem-based approach for the better management of resources. Instead, the study supports for the adoption of co-management principles as an immediate solution to resource crisis and livelihood vulnerabilities. It may be mentioned that our empirical findings were also supported by the developments in modern natural resource management theories (Pomoroy and Guieb, 2006; Ostrom, et. al., 1992; Berkes et. al., 2001).

This paper argued that interactions of estuarine communities with state and modern enterprises during the last five decades have produced a variety of management patterns relevant for sustaining their livelihood and ecosystem. Three probable variants are presented in this paper. In the first case, state overplayed its role as a regulator

by thrashing all indigenous initiatives, institutions and collective actions of community organizations. The authoritarian approach adopted by the state in the Perumbalam village is certainly against the long term interests of ecosystems and communities. In the second case, we have witnessed the possibility of the management system slipping into a state of anarchy where neither communities nor the state could effectively fulfill their roles in fisheries management. Obsolete formal institutions, lack of enforcement, social conflicts and political interferences were all contributed to the weakening of the management system in Aroor-Arookutty region. The final case study provided an interesting variant to proceed towards developing collaborative management models for estuarine governance. Existing notions of governance needed to be restructured to ensure resource sustainability and food security. One of the major factors contributing to such diverse patterns refer to the production of scientific knowledge that is insensitive to rights to resources and livelihoods. Since complex multiple commons like estuaries are not easily predictable, traditional knowledge systems and practices should be recognized as baseline information for institution building, policy formulations and for an accurate planning of micro level management. Cooperative partnership arrangements between different social actors at different scales should be made to protect traditional sustainable practices and their diversity. There should be a forum where different groups and agencies could exchange knowledge, negotiate alternative resources uses, reconcile conflicting objectives and develop a vision for common objectives that safeguard livelihood and environment. It is also necessary to update existing fisheries policies, to include provision for cooperative problem solving and partnerships.

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