J. Mar. Biol. Ass. India, 48 (1) : 76 - 82, January - June 2006

Marine resource conservation and management through a traditional community based institution – Case of *Kadakkody* (Sea-court) in Malabar Coast of India

C. Ramachandran and R Sathiadhas

Central Marine Fisheries Research Institute, P.B.No.1603 Ernakulam North P.O., Cochin - 682018, India

Abstract

This case study is about a unique institution called *Kadakkody (*literally meaning "sea court"*)* prevalent in Kerala, in Malabar coast of India. Its presence as well as the institutional reinvention it has undergone raises interesting questions like 1) how and why this institution has survived? 2) what role does it play in resource management? 3) status and validity of regulations endorsed by the *Kadakkody* and 4) does it offer any policy insights for resource management in tropical waters? It has been found that its persistence depends on a multiplicity of factors and so defies any bureaucratic duplication in its institutionalisation. The role of the State should be to enable political contexts that nurture the genesis and co-evolution of people's own resource management initiatives and institutions. What is required is the emergence of a new political ethos built on the foundations of ecology and ethics.

Keywords: Resource conservation, *Kadakkody*; Kerala, Fisheries science

Introduction

While building scenarios for a brave new world in fisheries by 2020, Delgado *et al.* (2003) say "sustainability-motivated environmental regulations and institutions will rapidly become more prominent, starting in the developed countries and then spreading to developing countries." Locating the source of future innovations in fisheries management as a geographical exclusivity may smack of either cultural appropriation or a lack of appreciation on the ecological motivation that can be supplied by certain institutional forms of natural resource management that still exist in some of the developing countries. Though the focus/rationale of modern fisheries management informed by fisheries science over a period of hardly two centuries, mostly a phenomenon of the developed countries, has vacillated from "Tragedy of the commons" (Hardin,1968) of the 1960s to "Precautionary principle" of the 2000s the challenge has remained the same. In this context it would be of interest to find that a traditional community based marine fisheries management institution namely *Kadakkody* has stood the test of many centuries in India.

Materials and methods

The study was conducted using the case study approach (Yin, 1984). The data collection was done using methods of participant observation, focussed group interactions and freewheeling interviews. The field study was conducted in four coastal villages (Kasargod, Kizhoor, Kodikkulam and Bakkalam) in Kasargod district of Kerala State over a period of four months. This included repeated triangulation visits done to check reliability and validity of the information gathered through the various methods. This case study analysis was attempted in the pattern of a grounded theory approach and hence no *a priori* theoretical framework was followed.

The case study protocol had the following diagnostic themes namely I) description of the constitution of *Kadakkody,* II) structure and functions of *Kadakkody,* III) its role as a Community Based Institution in marine fisheries management, IV) status and validity of regulations endorsed by the *Kadakkody,* V*)* interplay of factors that define its evolution as well as institutionalisation and VI) role of the state and policy implications. The results of the study has been organised according to the above themes.

Results

Constitution of "Kadakkody"

The *Kadakkody* which is considered as a linguistic aberration of the Malayalam word *kadal-kodathy,* literally means "sea- court" (*kadal* =sea and *kodathy* =court). But it functions more as a court as it has legislative, executive and judiciary roles to play in the *Araya* and *Dheevara* communities of Hindu fishermen belonging to Kasargod District of Kerala

state. (Kasargod lies between North latitudes - 11°18' and 12°48', East longitudes - 74°52'and 75°26').

*Kadakkodi*es make their presence felt strongly in four regions viz., Kasargod, Kizhoor, Kodikkulam, Bakkalam in Kasargod District. What makes this traditional community institution, working mainly as a conflict resolution mechanism unique is the supposed role it plays as a Community Based Fisheries Management Institution. No such institution has been reported from any other maritime states of India. Though functional only in a few pockets of North Malabar coast of Kerala, these age old institutions are similar to many of the Caste *Panchayats* which were prevalent in rural India (Baxi, 1982).

Structure and functions

The *Kadakkody* enjoys judiciary as well as executive powers by virtue of certain peculiarities in its constitution. Each *Kadakkody* is an adjunct to the temple of the fishermen community in each village. Each one consists of three distinct bodies, the members of which sit separately in three groups when the court is in action (Fig.1). They are *Sthanikans, Kadavanmar/Sahayiees* and *Temple committee. Sthanikans* (meaning "the permanently authorized") who are 11-13 in number are directly involved in the conduct of the temple rituals. They constitute the "jury". The *Sthanikans* are composed of four separate constitutional groups, namely *Karanavanmar,(*4 members*) Achanmar/Kshethresanmar (6* members*), Kodakaran; (*one member*) and Anthithiriyan (2* members*). Kadavanmar* are assistant priests acting mainly as temple messengers. Occasionally they take the role of "police" in accosting the complainant to the court at the command

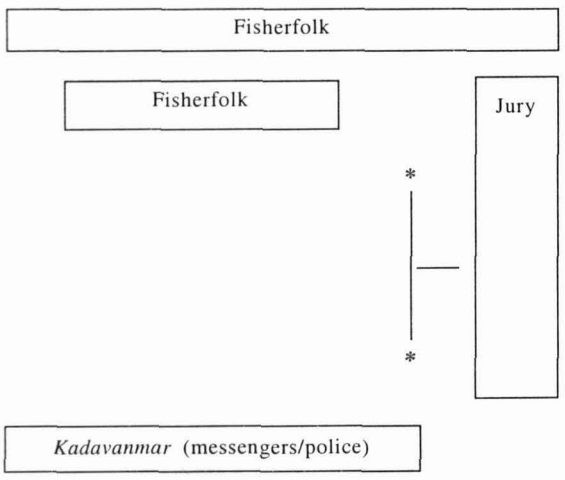

Fig.1 *Sitting arrangement of the court*

of the jury apart from providing services like passing errands and making announcement of holding of the court by hoisting red flags along the beach (known as *kodivalikkal*) or hanging fresh coconut leaves on the boats (known as *tholuvekkal*). No boats will go for fishing once the signal for holding of the court is given. The *Temple Committee* is a democratically elected body which looks after the administration of the temple. The committee has a president, a secretary and a treasurer. This is a comparatively recent addition to the court and can be interpreted as an attempt to strengthen the legitimacy of the court in tune with democratic aspirations of the community.

Role in fisheries resource management

Kadakkody has been hailed as a viable institution for Community Based Marine Fisheries Management (Kurien, 2003). But the question "whether it can be considered as a Community Based Fisheries Management Institution?" is seldom considered. An attempt was made to collect the unwritten or non-codified rules / norms evolved by the this institution over the years for the management of the fisheries resources across the four study areas. It was found that in general there were only four such measures now being practiced (though it was informed that there were more such regulations in the past and were stringently followed). They are given below:

1) Night fishing is banned during the months of June, July and August.

2) Gillnets are not allowed during monsoon. It is allowed after 5th of *Kanni* month (i.e., around 20-21 September). (In earlier days till the advent of motorization it was allowed only after 10th of *Thulam* (i.e., 9-10 October)).

3) Fishing is prohibited during the following occasions

   a) days when the temple celebrates annual festival (i.e., 20-24 March, b) when there is a death in the community, c) when sea-court is summoned, and d) auspicious days or any day as decided by the temple committee.

4) Fishery related disputes or conflicts should be first brought to the sea-court

Status and validity of regulations endorsed by the "kadakkody"

Night fishing during the months of June, July, and August has been banned and is strictly being followed as an age-old practice. However, there is a brewing discontent among the fishermen over the inability of the *kadakkody* in controlling mechanised boats coming from Mangalore located in the adjacent State of Karnataka doing night-

fishing in their waters. This, they alleged, defeats the restraint they have been imposing themselves. Such resentment among fishermen makes it difficult for this institution to impose strict fines and punishments to the defectors within the community as it used to do in the past. Though the fishers are convinced about the harmful effects of night fishing there are reasons to believe that the persistence of the norm could be more due to the sea becoming inaccessible for their motorized crafts during these monsoon months. Two reasons could be attributed to this conclusion: 1) that night fishing is harmful to the fishery is scientifically contested; and 2) that the period of prohibition for the use of gillnets has been reduced since 1980s after the advent of motorization.

In order to understand the validity of night fishing as a conservation measure the type of gears used by the fishermen as well as the nature of their fisheries need to be looked into (Table1).

But for one gear called *Ranivala,* which is a smaller version of ring seine, all others are indigenous variations of gillnets and most of the fishes caught are pelagic. The opinions of fisheries scientists of Central Marine Fisheries Research Institute (CMFRI) were, as shown below, divided over whether banning night fishing acts as a conservation measure or not (In the absence of specific studies on the issue, what is given is 'scientific speculations").

a) Argument I:"Not an effective conservation measure"

1) In fact night fishing was found to be beneficial (i.e., more catch) in the case of certain types of shellfishes like prawn (e.g. *Metapenaeus monoceros*).

2) Though the period (June to August) coincides with the breeding season of most of the fishes caught there is no evidence that night-fishing alone has a detrimental impact on their breeding behaviour. Daytime fishing also must be harmful. The only exception could be mackerel and sardine, which spawns during night (Bal and Rao,1984). The spawning season of these fishes is given in Table 2.

Table 1. *Description of the fishery and gears*

Description of the gear				Major fishes caught	Time of use
Name	Length (m)	Mesh size (mm)	Cost (Rs million)		
Ranivala (queen net)	375-400	18-20	0.25	Sardines, Mackerel, Prawns	Any time
Ayilavala (mackerel net)	450-475	58-60	0.05	Mackerel	Monsoon
Driftnet	900-1000	100-110	0.1	Seerfishes	Night fishing
Manjivala (pomfret net)	700-900	100-110	0.015	Manji* (pomfrets)	Early morning evening i
Kanathavala (dense net)	900	52-54	0.018	Whitefish, mackerel, small sharks, prawns	Anytime

Sardine = *Sardinella* spp; Mackerel = *Rastrelliger kanagurta;*
Seerfishes = *Scomberomorus* spp; Pomfrets = *Formio niger* (*Parastromateus niger*), *Pampus argenteus,P.chinensis;*
Whitefish = *Lactarius lactarius*)
*Manji in Kannada refers to pomfrets

Table 2. *Spawning season of fishes*

Species	Locality	Spawning season	Source
Sardinella longiceps	West coast	June-November	James ,1992
	Mangalore	May-Oct.	
	Calicut	May-Oct.	
Rastrelliger kanagurta	West coast	June-Aug;Oct.-Dec.;Mar.-July	James,1992
Scomberomorus spp.	SW Coast	May-August	Bal & Rao,1984
	Mangalore	Jan..-Sep.	Luther *et al.*, 1997
	Calicut	Apr.-May	
Formio/Parastromateus niger, Pampus argenteus, P.chinensis	SW Coast	July-October	James,1992
	Mangalore	Oct.-Dec.	Luther *et al.*, 1997
Lactarius lactarius	SW coast	November-March (peak Feb.-Apr.)	CMFRI,2002
Shrimps	SW coast	Through out the year	James, 1992

3) Since it is difficult to prevent fishermen from other places doing night fishing in their waters the feasibility of the measure is doubtful.

4) The state government has so far not declared night fishing as a destructive practice.

b) Argument II: "Yes, *a conservation measure"*

1) Most of these fishes exhibit vertical movement in the water column during night. Higher catch also means higher percentage of gravid fish especially during the breeding season, which may lead to recruitment over fishing.

2) Gill nets are usually operated during night and the beneficial effects of its prohibition during the period is complemented by the fact that monsoon trawling by mechanized boats, which is otherwise done during day time, is banned by the State government during June-July.

3) It is interesting to note that night fishing using purse seines during September-December has been prohibited by the Karnataka Purse Seine Fishermen's Association in Mangalore coast (Kemparaju *et al.,* 1992).

Interplay of factors

The dichotomy in the fisher's as well as the scientists' rationale raises certain pertinent issues which boarder on two kinds of crises we are confronted with, that of fisheries science on the one hand and that of fisheries management institutions on the other.

Since it is difficult to outrightly reject these measures imposed by the *kadakkody* as "unscientific", the typical positivist reaction would be to highlight the need for conducting more location specific studies on the behaviour of fishes as well as a study to assess the impact of indigenous regulatory measures. But the bigger question is whether it is necessary for the (public funded) fisheries science to crack its brains to provide a definite answer given the fact that there is allegedly a crisis in fisheries science itself (Symes, 1996; Wilen and Homans,1998) .

Fisheries management is primarily a decision process (Hilborn *et al.*,1993). Nothing captures the humility of fisheries science against its fatigue to be an unambiguous guiding light to fisheries management decisions, especially in the tropical waters, than the concept of Responsible fisheries, which is premised on the precautionary principle. As Jennings *et al.* (2000) admit, "in the absence of good science, insurance through the precautionary use (of no-take zones) may be preferable to reactive band-aids".

As in the case of any conservation measure, surmounting the difficulties of a neo classical economic valuation process in appreciating the intrinsic natural values (Hannon, 1997) could be the real reason behind the alleged crisis in fisheries science. The challenge is how to accommodate the shift in the burden of proof without romanticizing traditional ecological epistemologies while searching for a post –normal science paradigm (Ravetz, 1999) in marine fisheries research.

It could be argued that the absence of ambivalence, unlike the scientists, shown by the members of *kadakkody* (for that matter any Traditional Ecological Knowledge systems) on the "scientific sanctity" of their practices helps to fill what Cannibal and Winnard (2001) call as a "strategic gap"(Strategic gap is a condition of imbalance between what an institution or culture is and what it would like to be, considering its ability to achieve that desired state within the constraints set by its external socio-economic natural environment in an information-poor context of environmental management). The wisdom in resorting to a scientific legitimacy rather than a cultural one for making such decisions, as the case here, to manage the "chaotic interface between the social and biophysical complex", is questionable. Rather it warrants " a truly precautionary approach (which) requires a broader philosophical outlook than seeing the oceans as simply providing exploitable resources"(Gerrodette *et al.,* 2002).

Role of the state and policy implications

The revival and rejuvenation of traditional customary systems in the context of the new realities with a limited but crucial government involvement has been suggested as one of the most promising political options for upgrading and managing artisanal fisheries (Panayottou, 1982). The State is considered as the *de jure* owner of the marine resources and hence the responsibility of its management has been vested with it. At the same time the State often is blamed as a graver predator by its inability to be proactive in the sustainability point of view (Bavinck, 1998).

Though the government of Kerala has so far not considered the *kadakkody* seriously as a viable co-management mechanism, the action of the state in implementing fishery regulations like banning monsoon trawling has indirectly helped the legitimacy of the sea-court. The decisions of the State need to be based on scientific correctness; and the incompetence of fisheries science, as explained above, to provide unambiguous recommendations make it a difficult proposition. Now, the question is "Can or should the State take any role in this context? Or what lessons the case offers in terms of a policy framework for marine resource conservation?"

It is not easy to answer these questions as we are now standing at the interface of two different metaphysical systems of world views. The usual approach in studying traditional systems of knowledge is to subject it to reductionist methodologies so as to generate a list of conditions/strategies under which commons are governed sustainably. The total number of factors that affect successful management of commons may be somewhere between 30 and 40 (Agarwal, 2001). But the question is "Can anyone create a sustainable institution by "shaking up" the factors deciphered?". One may point out that the only missing link is the will of the people. But the realization that it is an awfully enormous gap should augur well for the State (national and international) to be proactive in recognizing and fostering *sui generis* forms of Community Based Resource Management institutions across the world.

The role of the State should be to enable political contexts that nurture the genesis and co-evolution of people's own resource management initiatives and institutions. What is required is the emergence of a new political ethos built on the foundations of ecology and ethics. A few possible such eco-political responses, which the state can initiate in this regard, are given below:

Like biodiversity it is easier to protect existing forms of cultural diversity than trying to build it, howsoever grandiose may be our theoretical foundations of sustainability (Berkes *et al.*, 2003). So, providing international recognition and support to such institutions by declaring them as Global Marine Stewardship Heritages like the UN declaring Common heritage sites will definitely help to invite attention of other fisher communities to take motivational cues and to boost the morale of the members of these institutions.

The sustainability of these institutions can be ensured if special considerations are provided to them in the implementation of neo-liberal market strategies like eco-labeling, eco-tourism or making use of the WTO provisions under geographical appellations so that they can garner premium price for their catch.

While designing communication /extension strategies for responsible fisheries management these institutions can be used as benign models of public-private interface as well as sensitization platforms (Scholz, 2004). It is possible to make use of these platforms as social laboratories to instill positive behavioural changes among the fisherfolk by co-developing suitable modules using emerging cognitive concepts like Neuro-Linguistic Programming , Social Learning, etc.

Necessary changes should be made in the fisheries policy of the concerned state to grant legislative sanction for legal autonomy in fisheries management related issues. It would be more effective if it is done in a holistic framework of local self governance rather than attempting fisheries management issues in isolation.

The state fisheries management institutions should seek the active support of the religious institutions prevalent in the region. It can call for religious institutions among the fisherfolk to go beyond the pontificating role of an external facilitator to that of an internal mediator who acts as a bridge between ecology and faith.

Discussion

The persistence of *Kadakkody* depends on a multiplicity of factors, which is so complex that it defies any bureaucratic duplication in its institutionalization as a co-management platform. Nevertheless, the process of its institutional reinvention can be made use of an opportunity to probe the possibilities of forging a convergence between public and private property regimes in the emerging context of decentralization of State power to local self-governance institutions.

Coexistence of institutions of local self-governance in a "State within State" mode is not impossible. If the state is able to deliver the governance as well as stewardship functions which it is ought to do by way of effective enforcement of fishery regulations (eg as provided in the Marine Fishery Regulation Act in the case of Kerala) it will ensure the complementary survival of these institutions and not vice versa.

But it is to be borne in mind that the whole process is circumscribed by technological innovations-indigenous or introduced (which is aggravated by the fact that it is at present left unbridled) and the difficulties involved in achieving a real sharing of resource management power (Pomeroy and Berkes, 1997). It is not out of context to mention that the state should desist from taking a reified view on Indigenous technical knowledge and should take a stringent precautionary approach in preventing the spread of indigenous innovations, which are often nothing but cleverly manipulated contraptions to circumvent existing fishing regulations.

Since the epistemological base that defines the logic of the conservation ethic of the community is an embedded social construct, validation of its legitimacy is beyond the scope of modern marine fisheries science. Or, perhaps, the project of modern marine fisheries science has to undergo a radical *volte face* process of "normative contextualisation" which should enable its findings to get

incorporated into the collective cognitive domain of the community.

If the conservation issues in tropical waters are too complex to invite mediation of a public-funded research system, the logic and logistics of the institutionalized marine fisheries R&D demands a serious review. It is naïve to anticipate that a multi-species, multi-gear/craft, multi-ethnic open access context of marine fisheries will be able to be more sensitive to scientific realities than the political ones. As Hilborn (2002) remarks "the key to successful fisheries management is not better science, better reference points or more precautionary approaches but rather implementing systems of marine governance that provides incentives for individual fishermen, scientists and managers to make decisions in their own interest that contribute to societal goals". This suggestion, however, is pernicious enough to leave the very social justifiability of the existing research configuration an open-ended dilemma.

Acknowledgements

The case study was conducted as a part of the World Bank funded National Agricultural Technology Project titled "Designing and Validation of Communication strategies for Responsible Fisheries –A Co learning approach"(CGP II 209 00 00011). We acknowledge the critical comments of Prof. (Dr.) Mohan Joseph Modayil (Director, CMFRI, Kochi) and encouragement of Peter Heijden (Course Director, IAC, the Netherlands). The opinions expressed are not necessarily that of the organization to which the authors belong.

References

Agarwal,A. 2001. Common property institutions and sustainable governance of resources. *World Development*, 29(10) : 1649-1671.

Bal, D.V and K.V. Rao. 1984. *Marine fisheries*, Tata Mc Graw Hill publishing company, New Delhi. p. 295-325.

Bavinck,M.1998.*One sea :three contenders-Legal pluralism in the inshore fisheries of the Coromandel coast,India*. Sage Publishers. p. 28-56.

Baxi,U.1982. The crisis in the Indian Legal system. Vikas Publishers , New Delhi.p.7-15.

Berkes,F.,J.Colding and C. Folke. (Eds.).2003. *Navigating social –ecological systems: Building resilience for complexity and change*. Cambridge University Press, London .p 23-24.

Cannibal,G.L and G.M .Winnard.2001. Managing the tragedy: an inter-disciplinary model for managing the environment as interacting chaotic hierarchy. *Futures*, 33: 147-160.

CMFRI.2002.Annual Report of CMFRI 2001-2002.p. 43.

Delgado,C.L., N.Wada, M.W.Rosegrant, S.Meijer and M.Ahmed.2003. Fish to 2020-Supply and demand in changing global markets. IFPRI, Washington and WFC, Penanag.p.151-52.

Gerrodette,T.,P.K.Dayton, S. Macinko and M. J. Fogarty, 2002. Precautionary management of marine fisheries: Moving beyond burden of proof. *Bulletin of Marine Science*, 70(2):657-668.

Hardin,G. 1968. The tragedy of the commons.*Science*, 162: 1243-1248.

Hannon,B.1997. How might nature value man? *Ecological economics*, 25 :265-279.

--------,R. 2002. The other side of reference points. *Bulletin of Marine Science.*,70(2):403-408.

Hilborn, R., E.K Pikitch and R.C.Francis.1993. Current trends in including risk and Uncertainty in stock assessment and harvest decisions. *Can.J. Fish. Aquat. Sci.*, 50:874-880.

James, P.S.B.R.1992. Impact of fishing along the west coast of India during south west monsoon period on the finfish and shell fish resources and the associated management considerations. *In:* Rao,P.V.,Murty,V.S and K.Rengarajan (Eds.) *Monsoon fisheries of the west coast of India –Prospects, problems and management*, CMFRI Bulletin,. No. 45:256-57.

Jennings, S., M.J.Kaiser and J.D. Reynolds. 2000. *Marine Fisheries Ecology*. Blackwell Science., p.339-347.

Kemparaju,S.,U.S.Bhat, G.S.Bhat and P.P.Pillai.1992. Guidelines issued by Karnataka Purse Seine fishermen's Association (Mangalore branch) to avoid conflicts among Purse seine operators. *Mar.Fish.Infor.Serv.,T &E Ser.*, 116:12-14.

Kurien, John .2003. The Blessing of the commons: Small-scale fisheries, community property rights and coastal natural assets. *Working paper 349, CDS* Thiruvananthapuram.p. 3-14.

Luther,G, P.P.Pillai, A.A. Jayaprakash, G.Gopakumar, Sathianandan, Molly Verghese, R.Sathiadhas and S.Sivakami.1997. Gillnet fisheries of India. *Mar.Fish.Infor.Serv., T&E Ser.*,No150: 1-24.

Panayotou,T.1982. Management concepts for small-scale fisheries: economic and social aspects. *FAO Fisheries Technical Paper* No228.Rome,FAO.p.7-24.

Pomeroy, R.S and F.Berkes.1997.Two to tango: the role of government in fisheries co-management. *Marine Policy*, 21(5): 465-480.

Ravetz, J.R.1999. What is post-normal science? *Futures*, 31:647-653.

Scholz,U.2004. Institutionalising traditional community based natural resource management. *IK notes*, No.64. p. 4.

Symes,D.1996. Fishing in troubled waters. *In* : Crean, K and Symes,D (Eds.) *Fisheries Management in Crisis.* Fishing News Books, London, p. 3-5.

Wilen, J.E and F.R.Homans.1998. What do regulators do? Dynamic behaviour of resource managers in the North Pacific Halibut Fishery 1935-1978. *Ecological economics*, 24: 290-294.

Yin, R. K. 1984. Case study research: Design and Methods. Sage, London, 254pp..

Accepted: 20 March 2006