

Management Anarchy in Complex Commons: A study of Cochin Lagoon Fisheries in Kerala, India

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Abstract

The development of international markets and failure of local communities to manage fisheries have been a major policy concern. Communitarian institutions that regulated access to fishing grounds and ensured a fair distribution of resources weakened. The response to this move within community was diverse. Individual fishermen violated traditional resource sharing customs and practices and resorted to illegal fishing in an attempt to sustain livelihoods. The State on the other hand strategically refrained from enforcing regulations which further fastened resource degradation and livelihood vulnerabilities. Hence the management anarchy that prevails in the lagoon fishery today is the product of both state and community failures. This paper focuses on the reasons for the community and state failures in the management of traditional fisheries in Cochin lagoon and analyses the livelihoods strategies adopted by local communities. The paper argues that the anarchy in lagoon fisheries prevents immediate solutions to resource degradation and livelihood vulnerabilities.

Keywords: *Complex commons, management anarchy, Lagoon fisheries, Governance, Livelihoods*

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Academic research on commons reiterated that human institutions like community, government, private property and markets are vital for resolving tragedy of the commons. However, the effectiveness of community and state institutions, to resolve resource crisis and conservation problems has been questioned by social scientists (**Acheson, 2000 and 2006**). They cautioned academics for lionizing institutional successes and reminded that institutions might fail to solve resource conservation problems under various conditions and that none of these are a general solution to the management of commons. The “co-management paradigm”, suggested as an alternative to overcome state-community failures was also experimented in many developing countries

to manage small scale fisheries (**Jentoft, 1989; Berkes, et.al., 2001; Edmunds and Wollenberg, 2001; Borrini 1997; FAO, 1999; O'Faircheallaigh, 1999; Ramírez, 2001**). However, shaping a socially acceptable cooperative partnership faced many challenges due to the diverse initial conditions, economic and political interests of various partners and external pressures. Economic disparities among fishing communities and enterprises and the authoritarian stand taken by state to evolve and sustain collaborative partnerships prevented various actors to participate in meaningful dialogues to negotiate their demands. Hence, even the co-management paradigm did not offer common platforms to negotiate various demands and conflicts and attain enforceable institutions that sustain resource health and livelihoods.

What evolved unfortunately was an inertia where individual agents refrained from negotiations and delayed the process of decision making for various reasons. Many small scale fisheries in developing countries have been witnessing such general failures and exhibited what is known as management anarchy¹. Briefly defined anarchy and anarchism are coordination on equal footing, without superiors and subordinates (**Grieco, 1988; Thompson, 2006; Bookchin, 1977**). It refers to horizontal organization and co-operation without coercion. Thus, anarchy and anarchism mean management and coordination without community/private sector initiative and political/administrative state control. Thus management anarchy is a scenario where neither communities nor the state or private industries engage effectively to deliver management functions for sustaining livelihoods and ecosystem health. Management of complex lagoons obviously is caught under such relations causing social and ecological vulnerability. It is therefore interesting to examine how the system slips into a state of management anarchy and to explore the possible paths of recovery.

The question is under what conditions are community and state controls weaken due to internal contradictions and external influences and what alternatives evolve when institutions fail and anarchy sets in? This paper argues how independent efforts of local communities and state fail to manage lagoon fisheries under the present top-down system of management. This paper is divided into five sections. Section 1 provides introductory remarks and section 2 introduces the study area. In section 3 we summarize the major reasons for the failure of community based management institutions and section 4 details the efforts of state to regulate stake net fisheries and the causes of state failures. We also argue that such failures could be resolved by reviving collective action and cooperative partnership arrangements between local communities and state through political processes. Section 5 provides the summary and conclusions of the study.

¹ Anarchy means coordination and management without ruling and thus rulers.

2 Study areas and communities

Cochin estuary is one of the largest lagoons located in the southern state of Kerala, India. As a multiple commons, the estuary offers diverse economic potential to various social groups. The study is conducted in an area that lies along the boundaries of Ernakulam and Allepy Districts adjoining Aroor and Arookutty Grama Panchayaths. Aroor lies on the western side of Arookutty and shares common boundary with it. Aroor has an area of fifteen square kilometres and its population is 36862 of which 18210 are male and 18652 are female. Arookutty is eleven square kilometres and inhabits a population of 16712 of which 8366 are women and 8346 men. The density of population is around 2433 per square kilometre, which is above national/ state average. This region is dominated by the Dheevara fishermen whose primary occupation is stake net fishing. 85 percent of the total number of stake nets operated in Cochin backwaters is located in this zone. There are 24 conventional fishing rows (paadus) and 1727 stake nets in this region. Aroor and Arookutty villages have fixed ten paadus each in this region of which two paadus were selected for intensive examination. The first paadu Ambipaadu established in 1965 by Aroor fishermen obtained license in 1976². Today 174 oonni's are attached to Ambipaadu fishing ground of which 108 are licensed and 66 unlicensed. Many applicants still await legal titles even today. The rival community, Mattepaadu, lies towards the south-east of Ambipaadu. Mattepaadu was first started in 1967 by four families settled in the three islands lying close to Aroor and Arookutty by fixing around 11 stake nets without procuring valid license from the Fisheries Department. The group had grown slowly during subsequent decades. Today, 121 illegal *oonnies* are operated in this paadu of which 109 oonnies are operated by 41 households from the Mattel Island, 10 oonnies are owned by Sree Subrahmanya temple and two by the Mattel oonnie union.

² While granting license the policy was to allot at least one oonnie per applicant, with a maximum of two oonies for a family. Many of the traditional oonni holders in other fishing grounds also transferred their oonies to this fishing ground. Licenses were granted again in 1984 to some oonni holders to Koombel fishing ground

The history of stake net fishing in the backwaters of Aroor- Arookutty area in Cochin estuary dates back to 400 years. Access to this fishery was controlled by the King as part of the general village administration and there was no separate management authority for stake net fisheries³. Fishermen had to make formal applications at the regional agricultural office of the King at Paravoor for fixing stake net in backwaters. The authorities sanction or reject these requests after consulting the local chief. An annual license fee of Rs 1.50 was levied and collected by “Mudalalanmar”. If fishermen failed to remit fees on time, fixing rights would be transferred to the next eligible applicant. Operations of illicit nets were discouraged with heavy fines-Rs.1000 or capital punishment. Fishing conflicts-both intra-village or inter paadu- were resolved through negotiations by the respective village chiefs after making physical verifications with the leaders of paadus. These settlements were generally accepted. After independence, state took over fisheries administration and crafted access rules through a system of licensing to regulate stake net fisheries. During nineteen seventies the demand for shrimp increased in international markets and brought in a number of changes in the fishing economy of Kerala.

a. Growth and concentration of stake nets

In the inland fishery sector boom in the volume of international trade in fish led to rapid expansion of prawn culture and an increase in the number of stake nets. Nets operated in Ambipaadu increased from 32 in 1960-70 to 70 by the end of 1980s; to 108 by nineties, to 174 by the beginning of 2000s and reduced to 139 in 2005. Similarly, the number of nets operated by Matte has increased from 11 in 1960-70 to 28 in 1970-80 and to 120 in 2005. (See table 1).

Table 1 Growth of stake nets in selected fishing paadus

Padu	1960-70	1970-80	1980-90	1990-2000	2000-05
Ambi paadu	32	70	108	174	139*
Matte paadu	11	28	85	121	120

Source: Primary survey, 2004

³ King extended his control over village resources through the head of a local feudal landlord called talaveed who reported directly to the village chief “Karthakkanmar” who were authorized to receive complaints and petitions and resolve fishing conflicts. They kept crime diaries where fishermen disputes and conflict resolutions were recorded. Major violations are reported to the police and severely punished. Above them, was the Dewan and above him the King.

Note: Nets operated*

Other stake net communities fishing in this territory also behaved in a very similar manner and launched illegal nets which resulted in an unusual growth of stake nets in the region. (See table 2). For instance of the total number of 1727 stake nets in the region, 794 are legal while the illegal nets are 933.

Table 2 Growth of illicit stake nets in the study region

Sl no	Name of the paadu	House holds	Stake nets		Total
			With license	Without license	
1	Mukkam pad	37	57	117	174
2	Aroor palam	48	0	98	98
3	Aroorpalam	54	0	99	99
4	Puthiyatt(Kadaviparambil)	20	102	0	102
5	Chencheri	37	92	8	100
6	Chencherithekkae thara	14	0	33	33
7	Koonam pad	40	98	27	125
8	Koombelkuunu(Ambi)	60	108	66	174
9	Mattel pad	41	0	121	121
10	Kootapuram thara1	9	0	17	17
11	Kottapuram thara 2	4	0	11	11
12	Kottapuram thara 3	14	0	17	17
13	Kottapuram thara 4	13	0	35	35
14	Kottapuram thara 5	4	0	9	9
15	Kottapuram thara 6	8	0	19	19

16	Kottapuram thara 7	79	0	42	42
17	Angadipad	19	39	21	60
18	Padinjaraematteltheckae thara	5	0	10	10
19	Vaduthala kochu pad	52	0	66	66
20	Vaduthalakochupad kizhakkae thara	5	0	11	11
21	Vaduthala pad	50	78	0	78
22	Panagad chowkaekadavu oonni sangam	30	130	0	130
23	Kavungal kizhakkethu	47	90	7	97
24	Kedassery	33	0	99	99
	Total	723	794	933	1727

Source: Thomson and Berkes, 2006

It was shocking to note that most of the households which started stake net fishing with one net procured more nets and operated them during this period. The survey revealed that only six percent of households owned one net or less in Ambi paadu. 72 percent of households own two to three nets and 16 percent owned four to seven nets. In the case of Maatelpaddu, 65 per cent owned two to three gears while 35 per cent owned gears between four and seven. (See table 3).

Table 3 Concentration of stake nets in selected paadus

Size class	Ambi paadu	%	Matte paadu	%
0-1	4	6	0	0
2- 3	53	72	24	65
4-7	16	22	13	35
Total households	73	100	37	100

Source: Primary survey, 2004

The growth and concentration of stake nets was attributed primarily to a steady growth in the price of prawn⁴, growth of population and family size and strong livelihood crisis especially among fishing castes. The evolution of many illicit paadu systems and growth of illicit nets has been the product of this livelihood crisis. Fishing trips increased while the mesh size decreased to 8

⁴ For instance, the producer price of different prawn has increased from Rs.15 in 1970 to Rs.25 in 1980, to Rs.48 in 1990 and 78 in 2000.

mm. This period was revolutionary for fishers as they could attain better standard of living due to a high level exploitation of fish stock from this area.

b. Ownership and transfer of stake nets

However, as one household could operate only one net at a time, those who owned more nets started leasing out these nets to local fishermen through two local channels known as ere known as Panayam and Pattam. In the former case, the owner leases out his fishing net to a lessee for a lump sum cash. The present cash transfer for one licensed stake net ranges between Rs.75,000 and Rs.200,000 and in case of illicit onnie it is around Rs.15,000 to Rs.30,000. Under this contract, the lessee returns the net to the owner after the latter pays back the amount. In the case of pattam, the owner leases out the right to fix net to a lessee for a mutually agreed period, normally one year, by taking lump sum cash as rent. The present level of paatam is about Rs 10000 to Rs.15000 per annum for a legal stake net and Rs. 5000 to Rs 10000 for an illicit net. Our field inquiries revealed that the system of panayam is more common for stake nets with license while the system of paattam is common for illicit nets. During the survey year 2004, 10.5 onnies were leased out as panayam in Ambi paadu. Moreover 10 nets owned by the temple and five nets owned by various individuals in matte paadu were given for pattam.

c. Fishing conflicts between Ambipaadu and Mattepaadu and role of fisher organizations in conflict management

The annual gross revenue produced by 139 fishing nets in Ambi paadu was estimated as Rs. 1,39,67,554/- and the monthly per capita income was estimated as Rs. 31,878/-. Gross revenue from 120 nets operated by Mattel paadu on the other hand was slightly lower (Rs. 1, 20, 58,320/-) and the monthly per capita income was Rs. 14,230. This means that stake net fishing was economically viable and the gross revenue from fishing and income of Ambipaadu fishermen exceed that of Mattelpaadu. It was therefore not surprising that this led to conflicts between these two communities over sharing resources. Ambipaadu community pointed out that as Mattepaadu was positioned on its southern side it blocked tidal functions and inflow of fish into their paadu. They alleged that their catches declined due to growth of illicit nets in the region and demanded immediate closure of this illicit fishing row. Mattel paadu on the other hand pointed out that there was no scientific evidence that catches had declined and that they have no other option but to undertake fishing for livelihoods. As the issue could not be resolved at the level of communities, the license-holders of Ambipaadu questioned the legality of Mattel paadu in Cherthala Magistrate court in 1984 and registered the union of licensed oonni holders named "Koombel Kunnel Oonni Sangam" to cover court expenses. Mattel fishermen retaliated by forming another union named "Mattepaadu Oonni Tozhilali Sangam". Disputes continued with no signs of immediate settlement.

However the search for an unprejudiced envoy to enforce resource management plans and resolve fishing conflicts always preoccupied local communities. Local branches of the caste organization **Akila Kerala Deevara Sabha (AKDS)**, AKDS 18, AKDS 19 and AKDS 20 have been active in finding mutually acceptable solution to the conflict between the rival communities⁵. The illegal fishing community, Mattepaadu did not accept the authority of AKDS's as the latter discouraged the introduction of illicit onni's. However, AKDS maintained a soft corner in the case of illicit onni operators of Ambipaadu due to socio-political reasons. This dual role has considerably affected the credibility of AKDS as a neutral mediator of fishery conflicts. Those who obtained formal license from Fisheries Department formed the Akila Kerala licensed Onni Association (AKLOA). The unorganized illegal fishers on the other hand retaliated by forming local fisher unions under the banner of leading political parties like the Indian National Congress and the Communist Party of India (Marxist). However none of these efforts ensured effective management and rational distribution of resources. Case studies indicated that illegal fishing was extensive and informal institutions brought in only limited success in this region. The classic example of such failures is the life long rivalry between Ambipaadu and Mattelpaadu community in the study region.

It is evident from the above discussions that community failure cropped up due to weak organisational structure, ineffectual leadership, lack of focus, opportunistic behaviour, lack of enforcement mechanisms and weak cross-scale linkages. First, the command and control mechanisms of AKDS, the organization that coordinated management functions in the past, degenerated as it shifted its focus from village level issues to the state level. AKDS emerged as a mediator between the state and communities for procuring large social benefits. AKDS feared that most of the illicit net owners would not support it had it insisted enforcement of access rules. At the same time, it became strategically impossible for AKDS to support the new illegal fishers into local fisheries as such alliances risked its legal position and legitimacy as a responsible organization that leads fisher communities in their struggle for large transfer of social goods from the state. AKDS feared that backing illegal fishermen amounted questioning the formal legal order and authority of the state which in turn might lower its goodwill and reputation in its negotiations with the state for larger social benefits and concessions. In this process, however, AKDS lost its control over bulk of the local producers. Moreover, by fixing nets (both legal and illegal) for meeting its organisational and management expenses, AKDS itself started collecting huge amounts from

⁵ Deevara community is now fragmented under various organizations named Anandadayini Karayogam, Eda Kochi janodayam; Deevara parishkarani; Sreeboothanatha karayogam and AKDS. These organizations mainly network religious activities and undertake only macro level policy issues with the state.

local fisheries. For instance, Deevara temple of Mattel paadu community owned and operated 10 illicit oonnis, while unions affiliated to political parties operated two. This opportunism ruined credibility of fisher organizations and hold off people away.

In traditional paadu communities, members were hierarchically linked. Proper linkages among neighbouring paadu communities ensured the best delivery of management functions. Horizontal linkages to address ecological degradation and livelihood crisis did not evolve due to political rivalries and the tacit agenda of state to weaken and destabilize communities from raising their voices against diverting coastal resources to private industrialists. In fact traditional paadu communities in the past were concerned about natural habitats, biodiversity and environmental quality of estuaries. But as development activities increased and produced externalities they changed their focus to individual gains and redefined objectives to maximize production and earnings. The break down of traditional conservation institutions, and market failures compelled local communities to opt out from fisheries management. Since day-to-day monitoring and graduated sanctions declined, fishers expressed opportunistic behaviour that further damaged commons. The growing prices of prawn intensified illicit fishing and loss of biodiversity. State most often took advantage of such weak moments within organizations to obtain political support in elections. The AKDS had to sprint a dual political agenda by siding both the Congress and the Communist alliances which resulted in the fragmentation of leadership within AKDS. Individual members moved out from the parent association to form alternate religious associations. The Congress party now controls political organizations like paadu unions and work independent to resolve fisheries conflicts.

The analysis presented above clearly establishes that there were elaborate informal institutional practices and organizational hierarchy in traditional fisheries management systems in the study area. The modernization plans of state and vibrant fluctuations in international markets brought an era of open door policy and traditional institutions could not arrest opportunistic behavior of producers and political power games. The access, which was once controlled and regulated by princely rulings, got digressed for political benefits and power games. The degradation of estuary and management of stake net fishing became the bandwagon for ensuring votes of fishers⁶. Thus local communities failed miserably to regulate the ecosystem health and unauthorized entry of fishing nets into this territory. The failure resulted in at least two fundamental changes. First, local fishermen possessing official fishing licenses added nets as a response to capitalize the benefits of a growing international market for prawns. Second, the relatively poor people in the community also launched

⁶ Today access is regulated through various self-organizing practices of local paadu communities with the help of political parties and unions. The state concentrate more on welfare activities than fisheries management.

illegal stake nets in an attempt to sustain livelihoods. In other words, as the economy opened up due to development of international markets, local communities failed to control externalities and access to fishing grounds. Such pressure on resources led not only to the decline in catches, production and productivity of stake net fishing but also to livelihood vulnerabilities and conflicts between licensed and illegal fishermen.

4 State failures in stake net fisheries management

As already mentioned, the State government, through the Department of Fisheries has been actively involved in stake net fisheries management. After taking over fisheries administration from the princely state, Kerala Government enacted a variety of legal directives to regulate stake net fishing. The state also floated cooperative organizations like MATSYAFED under Fisheries Department to address fishery problems and encouraged local Panchayaths to regulate use of illicit nets⁷. The primary functions of these formal organizations and management institutions were to define and change boundaries, regulate access, decide appropriate levels of harvest, introduce incentives and penalties and enforce and monitor these rules to ensure socially acceptable outcomes and benefits to communities. To do so, state replaced traditional management institutions with formal rules and entrusted bureaucracy to implement and enforce them. The system of granting license to fix nets continued with minor modifications. Fresh licenses were issued till 1983 and terminated completely since then.⁸ Formal rules to separate fishing territories between districts and Panchayaths and rules/norms to dictate distance between nets, the length of nets to be operated etc. were crafted by the state. For instance, Section 19 of Government water rules 1974 regarding fishing in Government waters stipulated that the distance between two stakes in a stake line shall not exceed four meters and distance between two stake line shall not be less than 50 meters. All stake lines did not follow this rule, as local adaptations would be necessary to account for ecological variations and socio-economic considerations. Mesh size was regulated through the Travancore-Cochin Fisheries Act (1950) to arrest juvenile fishing⁹. Section 22 of the

7 The Panchayaths, which are grass-root level decision-making body of the state, do not interfere in these processes of granting and monitoring licenses although they do intervene in larger issues facing the estuary. To a great extent the fishers do not depend on Panchayath for problem resolutions as they are under-represented in the Panchayath. The fishers depend on them mainly for gaining loans.

8 Vide GO No.61373/F2/80/F&PD

9 The permissible mesh size for the code end of state net was fixed as 20mm. However not even a single unit followed these state imposed regulations seriously (**Meenakumari, et.al., 2002:31**).

Government Water Rules 1974 ruled that stake nets shall not be operated during flow tide (high tide)". But due to lack of proper enforcement, most of the fishermen were fishing during high tide. State law also banned the use of small mesh size "peruvala" nets, which captured juveniles.

Reasons for state failures

Failure of state to manage stake net fisheries has been due to many reasons. First, the Travancore-Cochin Fisheries Act 1950 and rules did not offer flexibility to accommodate the genuine demands of local communities seeking formal access to various fishing grounds. The state sponsored a scientific study to craft norms for granting fresh licenses in 1972 and issued fresh licenses in 1974 and 1982. After that the state closed granting fresh licenses. However, the available official data revealed that state has been granting licenses under political pressures to various groups even after its formal declaration. (Table 4).

Table 4 Growth of stake net licenses in Kerala

Districts	67-68	69-70	71-72	96-97	97-98
Kollam	973	887	829	829	829
Alleppy	1414	1500	1511	2073	2073
Kotayam	566	869	869.25	722	722.25
Ernakulam	2969.5	2976.5	2976.5	3656	4182
Trichur	384	371	410	472	363.5
Kozhikkod	121	111	114	139	110
Kannur	750	750	761	429	517
Kazargod	0	0	0	0	279
Malapuram	0	28	28	0	0

Source: Fisheries Directorate, Ernakulam

Second, state followed a growth oriented development agenda to maximise the multifunctional values of Cochin estuary. During the past three decades, estuarine resources had been subject to severe pressure from private sector to produce modern economic values from tourism, water transport and water based industries. State encouraged industrialisation and even made public investments on construction of bridges, and other infrastructure¹⁰. Modern industries used estuarine resources free of cost and even polluted the ecosystem that caused degradation of estuarine biodiversity (**Thomson, 2002, 2003 and 2004**). In other words development of modern industries and the inability of state to regulate externalities resulted in the degradation of fish and shellfish diversity of this region. It is therefore illogical to argue that traditional

¹⁰ Thannermukkam Bridge was constructed in 1974. In 1985 the railway bridge as well as the Aroor-Kumbalam bridge were constructed. The Goshree brides were commissioned in 2004.

stake net fishing operations are the primary reason for resource degradation in this region.

Third, lack of experience, transparency, inefficiency, confusion in granting licenses and lack of community cooperation weakened effective implementation of state's management strategies in the local area. As a result, number of illicit nets in Aroor-Arookutty region more than doubled during the last 30 years. In fact, 70 percent of the illicit nets came up during this period. To accommodate the growing demand to access fishing grounds, the state announced a package to legalize illicit nets in 1976 and later in 1984. Under these schemes the state legalized many nets belonging to Ambipaadu and rejected applications of Mattel paadu without assigning any reason. Such differential treatment caused anxiety and resistance from households who did not receive license.

Fourthly, there was a heavy rise in the transaction costs of management and the state could not bear these costs to regulate access to various fishing grounds (**Abdullah, et al. 1997**). Before 1980, the Fisheries Department used to supervise and monitor stake net fishing activities and supervision costs were met by the state. Illegal fishing activities were hence detected and discouraged. Fisheries Department arranged periodic monitoring and enforcement of fisheries laws upon the directives of court and offenders were punished as per existing rules. However, enforcement and monitoring institutions of Fisheries Department did not function effectively due to lack of funds and other supporting facilities and resulted in an increase in illicit stake nets. State had cut down, and later stopped financial provisions for monitoring activities and fishery officers stopped monitoring activities since 1985. Illicit nets were not confiscated and no one paid any fines.

Finally weak graduated sanctions and punishments prompted communities to violate formal rules. The level of fine for fixing illegal nets as included in the Government water rules 1974 section 23, 29 (a), 29 (c) was as low as Rs 100/- and fishermen did not mind paying this fine if caught. A detailed analysis on trends in punishment for violations committed by study communities revealed that high level of monitoring and sanctions during 70's and 80's reduced drastically during the subsequent decade and by 2000 it has reduced to bare minimum. (Table 5). The table shows that Mattelpaadu was punished more frequently during the 1970's and by 1980's it got stabilized and by 1990's the score of punishment reduced to the lowest scale¹¹. As the situation got unmanageable due to social protests, the Fisheries Department stopped patrolling and punishment and that led to a management vacuum in this area.

Table 5 Trends in punishment during 1970-2005

11 The main reason is the strong political union in Mattel. The union is formed in 1985 and from there onwards we can find that matte is dominating the scenario to a great extent.

Fishing ground	1970-1980			1980-1990			1990-2000			2000 -2005		
Options	P	N	F	P	N	F	P	N	F	P	N	F
Ambipaadu	H	H	H	M	M	M	L	L	M	L	L	L
Mattel paadu	H	H	H	M	M	M	L	L	L	L	L	L

*Note: P= Taking away poles, N=Taking away Nets, F= Imposing Fines
Scales : H =8-12 times/ year, M = 4-8 times/year and L= 0-4 times /year*

The above analysis reveals clearly that states Fisheries Department was not successful in evolving appropriate institutions to enforce formal rules to ensure rural livelihoods and resource sustainability. Today Government enforces fisheries laws only in those cases where the judiciary intervenes. As such, judicial interference is rare and enforcement feeble. This confirms that state sponsored enforcement of fishery laws are expensive compared to the benefits earned. High cost of enforcement led to selective enforcement as and when demanded and did not guarantee resource health and livelihood security. As the legal system became weak, it failed to deliver the required services to stake net fisheries management.

5 The nature of management anarchy and the way forward

The arguments outlined above therefore show that, as independent agents, both state and communities failed to regulate access to stake net fishing grounds and manage common pool resources and resulted in an overall degradation of fisheries wealth in this area. This scenario is what we characterize as management anarchy, a situation where agents governing and those being governed minimize their mutual interactions to avoid direct confrontation. Such dormant mode of management is extremely suicidal for the sustainable development of natural resources and community livelihoods.

In order to clarify the nature of management anarchy that prevails in the management of stake net fisheries in Cochin estuary, we made a detailed comparison of community's dependence/ interactions on various informal and formal management organizations. (Table 6).

Table 6 Interactions between communities and management organizations

Organization	Ambipaadu		Mattel paadu Illegal
	Legal	Illegal	
AKDS			
Crafting non- fishery (religious) institutions	Yes	Yes	Yes
Financial interventions and assistance	Yes	Yes	Yes
Fishing problems with other paadus	Yes	Yes	No
Fishing problems within the paadu	No	No	No
FISHERIES DEPARTMENT			
To procure fishing license	Yes	Yes	Yes
To transfer Oonies	Yes	No	No
To pay license fee	Yes	No	No
To resolve inter paadu conflicts	Yes	No	No
For payment of fines	Yes	Yes	Yes
PANCHAYATHS			
Local level fisheries conflicts	No	No	No
Macro level fisheries conflicts	Yes	Yes	No
Subsidies for fisher men	Yes	Yes	Yes
Grants and loans	Yes	Yes	Yes
POLITICAL PARTIES AND UNIONS			
Inter fishing ground problem solution	Yes	No	Yes
Intra fishing ground problem solution	Yes	No	Yes
Creating fisheries institutions	No	No	Yes
Communicating with higher ups	Yes	No	Yes

The traditional community organization, Akila Kerala Deevara Saba (AKDS), do not directly negotiate conflicts between legal and illegal fishermen today. Instead, it continues to involve in financial and religious issues. After it withdrew from management activities, licensed onni operators of Ambipaadu recently formed a state level association called Akila Kerala Licensed Oonni Association (AKLOA) to protect and represent their interests. Some of the office bearers of AKDS are rich and politically influential. Sabha supports only licensed fishers than illicit

fishers. Such preferential treatments have motivated younger generations and illicit stake net holders to move away from the organization. Internal conflicts and inability to deliver timely services to community members reduced AKDS's authority, power and social acceptability and further weakened it as a producer organization. The Aroor-Arookutty Panchayaths, being the lowest level administrative bodies of the state do not interfere in local level fishing problems and discuss issues only if various political parties intervene and bring up them in local level decision making meetings. To a great extent fishers do not depend on Panchayaths for problem solving as they are under-represented in Panchayath administration. The fishers depend on them mainly for gaining loans.

Today political parties and trade unions play effective role to resolve both inter/intra-fishing ground conflicts in both fishing grounds and politics has emerged as the binding collective force for resolving fishery conflicts. More fishermen still prefer security of formal license. Many of them have applied for fishing license and are still trying to procure it through the politics of livelihoods. Demonstrations, picketing, hunger strikes and sometime violent clashes are all the strategies of this political action. Such democratic compulsions further weakened the state fisheries department and led to management anarchy.

Resolving management anarchy: role of political processes

How do we resolve the anarchy that developed due to the selective withdrawal of both communities and state from the management of stake net fishing in complex lagoons? There is no easy way out. However, as mentioned above, certain local initiatives are definitely evolving, especially through a localised political action of various agents being governed, which need to be scaled up for effective fisheries governance. A short description of these local processes is detailed below.

As soon as resource crisis set in and fishery conflicts escalated, each of the paadu communities established links with political parties-both ruling and opposition- in an effort to exert an effective pressure on the state for crafting policies and institutions to sustain livelihoods and ecosystem health. It is interesting to note that both legal and illegal fishers kept strong relations with same political parties and local politicians and the latter encouraged these relationships and promised solutions. Thus the issue of resource crisis and fishing conflicts were ballooned to higher political planes and negotiations for conflict resolution went beyond local communitarian and administrative set up. The political affiliation of fishermen of Ambi paadu in Aroor was complex as most of them supported different political parties as individuals while their association (Onnie Union) as a collective supported that political party which favoured its interest most. It was observed that most of the Unions supported the Communist Party. In the case of Arookutty, except one paadu, all others supported the Congress Party. The unions played an effective role to resolve conflicts among fishing communities. The striking feature was that although

individual fishermen belonging to licensed fishing paadus/grounds bargained for institutional change to adapt to external changes, the association was not focusing on the same. The illicit fishing paadus/grounds could do the same, through a variety of informal alliances with local politicians and bureaucrats.

Unfortunately there were no horizontal linkages between the paadu communities. Political unions of each paadu systems acted independently and maintained vertical linkages with their political higher ups. For example the congress party controlled both Ambipaadu and Maattepaad and assisted them to procure license from Government. The same congress party twice protected the Mattepaadu from being displaced. This duality in approach led to non-cooperation between community members and became the greatest hindrance for developing horizontal relations between community members. Political parties supported paadu communities for political benefits. The conflicts still persist due to these facts, as political parties attempted short term solutions by performing a dual role. State level fisher organizations like Akila Kerala Onni Licensers Association and All Kerala Non Licensers Association could also been able to resolve conflicts yet.

Conclusions

In the literature on commons management, there are numerous examples of traditional communities, particularly locally situated small user groups that have succeeded in regulating harvesting and access to different common-pool resources by creating and refining management institutions to overcome collective action problems. **(Baland and Platteau, 1996; Bromley, 1992; Ostrom, 1990; Pinkerton, 1989)**. Notwithstanding the fact that many of these traditional management systems have some form of commons management, they often have been undermined by post modern development agendas and government policies. The control exercised by fishermen in a pure self-governing system, breaks down in a modern and complex society due to the influence of many external drivers of resource use. As explained above, when market developed for fish products, it put pressure on the resource, resulting in increased production for sale and weakened traditional management. Thus our findings confirm that totally autonomous self-governance is not a realistic management option for a complex and diverse lagoon fishery in modern societies **(Symes and Phillipson, 1999:64)**. The belief in developing countries that top-down hierarchical governing of fish resources could resolve fishery crisis is also shaken as many top-down systems failed to manage complex socio-ecological systems. The case study revealed that lack of adequate monitoring devices, high enforcement costs, lack of trained personnel, financial resources and subordination of environmental concerns to short-term economic or political interests are responsible for state failures. Hence neither bottom-up nor can top-down regulatory approaches be expected to work on their own. Bottom-up approaches lead to insufficient conservation, since there are wider public interests in conservation that are unlikely to be fully

internalized into the calculations of fishermen themselves. On the other hand, top-down approaches fail, first because fisheries, being a complex and unstable ecosystem and needed continuous feed-back loops between those operating on the ground and those who define rules. Thus, there are no basic and fixed governance structures that apply to all types of fisheries (**Hanna, Folke, and Maeler (eds.),1996 ; Kooiman, 2003; Svein et.al., 2008**).

Our case study reminds that traditional communities are unable to change their own intuitional frameworks when external changes invade their economic activities. As communities move from closed to an open economy, they fail to reform and modify traditional principles of governance to manage resources. One of the major reasons for this failure is related to high costs of management. Information regarding external agents and their activities are uncertain and more complex procedures are required to handle uncertainties. The state-centric governance as exercised today does not resolve this dilemma either. The study reveals that wrong choice of development strategies, inexperience of state machinery to adapt to external institutional arrangements, lack of measures to regulate externalities and biodiversity degradation are the major challenges that state faces in this regard. The market, trade practices and global scenarios are fast changing while state machinery and its formal laws are way behind to go in hand with them. Ruin of the commons is the outcome of this management inertia. However, communities attempt to overcome the management crisis by evolving alliances with the larger political processes. Their move towards political solutions is to be viewed in this direction. Solutions arrive outside the legal domain with political interventions and the system survives as a result of such democratic dispute re-dress mechanisms. Our findings point towards alternate cooperative problem solving strategy that integrates communities and state through political processes for a politicised comanagement of stake net fisheries of this region. The success of such an approach however lies on evolving enabling institutional processes that build such politicised comanagement.

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