Role of Collective Action and Governance in Implementing Sustainable Fishing Practices: A Case Study of Karnataka Marine Fisheries

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Abstract: *In coastal Karnataka two hundred thousand fishing households are directly dependent on marine fishing which provides livelihood, security and minimizes the vulnerability to chronic poverty. The small-scale fisheries employing labour intensive harvesting, processing, and distribution technologies to harvest near-shore fishery resources were contributing less to the output and more to the employment. However, rapid growth of mechanization and expansion of international trade coupled with growing number of non-fishing communities in fisheries sector caused a transformation of fisheries during the past two decades. Macro level assessment of per capita income from fishing shows a declining trend during the last 10 years although the overall net domestic product in the region has been increasing. The declining resources and increasing use of coastal waters for non-fishery related activities have undermined the role of small-scale fisheries and its capacity to provide ecosystem goods and services. The restoration of small scale fishing requires a multi-pronged fishery management approach including community support and action. The recently organized stakeholder consultations with different fishing groups have evolved scope for executing collective management measures. The study is based on the outcome of a number of stakeholder consultations organized during 2016 as part of the national programme of International Collective in Support of Fish workers (ICSF) to disseminate and implement the Food and Agriculture Organization (FAO) "Voluntary Guidelines for Sustainable Small-scale Fisheries". The study is based on expert consultations, meetings with community based organizations and stakeholder consultations. Two prominent community based organizations were consulted regarding the impact of executing the FAO guidelines. The stakeholders consultation have focused on three major action research issues such as identification of measures to minimize the negative impact of implementing FAO guidelines on small-scale fishers, restriction and gradual removal of fuel subsidy to destructive fishing practices, reducing the dependence of women on state sponsored support schemes, integration of*

community based management measures with state fishery regulations, mobilizing community support/social capital for discouraging un-sustainable fishing technologies. The results of the study was helpful in understanding the real issues of governance and collective action required for the implementation of common fishery management regulations such as extended closed seasons and areas, introduction of minimum mesh size, limiting fishing effort through scientific licensing policy.

Key Words: *FAO Guidelines on Small-scale Fisheries, Sustainability, Social Capital, Collective Action, Fishery Management Regulations.*

Introduction

Overexploitation of fisheries in developing, tropical countries represents a particularly intractable problem because of institutional failures, ecological uncertainty, political and socio-economic considerations, market forces and a decline in social capital. Like many nations, India has attempted to both develop and manage fisheries, often with mixed or conflicting results. Many Indian fishers remain mired in poverty while the ecological and economic health of fisheries is at risk. Traditional community institutions that once governed local fisheries have largely been replaced by weak command-and-control measures, which often fail in the face of political, social, technological and economic forces. Fisheries in India also differ greatly, employing different gears across spaces with varying efficiency.

Classical fisheries economic theory predicts that without strict limits on access or effort or clear, secure property rights to the resource, fishers will apply excessive levels of effort in competition with each other. Increasing market pressures as well as so-called development may further diminish individual or collective incentives to self-limit. Conservation by reducing fishing effort becomes irrational for any individual, as uncaught fish today may not be available tomorrow (Gordon 1954). Fishers catch whatever they can in the present, ignoring their effect on future stocks and harvests (Scott 1955). The theoretical "race for fish" ensues, and, in an unregulated fishery, conservation becomes an afterthought.

Trying to limit fishing effort, governments introduce command-and-control regulations such as fishery closures, primarily to prevent overfishing of stocks. Some nations have even attempted complex measures to assign quasi-property rights to fisheries. In India, one of the primary regulatory mechanisms are

monsoon season bans on fishing by some or all gear classes. The ongoing debate about effectiveness of the fishery closures is one of the focuses of this paper. We first discuss the conflicts of executing fishery management regulations as applied to the seasonal closures and then examine effectiveness of fisheries governance in executing policies for sustainable development of the fisheries.

Objectives

1. To review the present status of Marine fisheries in Karnataka.
2. To assess the conflicts in executing fishery closures.
3. To examine the role of collective community action in effective implementation fisheries regulations and policies.

Methodology

Coastal fisheries represent diverse groups of fishers following diverse technologies targeting identical resources in fishing grounds with unequal fishing intensity for the same common property resource leading to conflicts within and outside the community. In order to understand the nature conflicts and resolution mechanism we adopted multiple methods of collecting qualitative and quantitative data. The observed conflicts were validated through five focus group discussions and on stakeholder consultation workshop at the state level guided by International Collective in Support of Fish workers (ICSF) based in Chenai. The ICSF supported expert consultation was organized at Malpe during 2016 as part of the national programme of International Collective in Support of Fish workers (ICSF) to disseminate and implement the Food and Agriculture Organization (FAO) "Voluntary Guidelines for Sustainable Small-scale Fisheries". Two prominent community based organizations were consulted regarding the impact of executing the FAO guidelines. The stakeholders consultation has focused on three major action research issues such as identification of measures to minimize the negative impact of implementing FAO guidelines on small-scale fishers, restriction and gradual removal of fuel subsidy to destructive fishing practices, reducing the dependence of women on state sponsored support schemes, integration of community based management measures with state fishery regulations, mobilizing community support/social capital for discouraging un-sustainable fishing technologies.

Fishing in Karnataka

The fisheries along Karnataka's 300-km coastline include dozens of commercially important species; total potential is estimated at 425,000 metric tons. Fishing remains mostly confined to the shallow coastal shelf, though fishers are expanding into ever-deeper waters as engine sizes and the number of large boats increase.[1] According to the fishery census published in 2012 by the Central Marine Fisheries Research Institute (CMFRI), Karnataka has 30,713 marine fisher families for a total fisher population of 167,429. Roughly 32,000 people actually fish full-time and almost 9,000 more fish part-time or collect fish seed. More than 34,000 others work in jobs such as marketing, net making or processing. Considerable additional labor migrates from other states.

According to CMFRI, Karnataka fisheries host 3,643 mechanized boats, the majority being trawlers.[2] Another 7,518 motorized boats (often modified traditional craft with outboard motors) and 2,862 non-motorized craft also exist in the fishery, though many may be left idle during peak mechanized fishing seasons. Karnataka's fishery infrastructure includes 206 ice plants, 10 freezing plants, 36 cold storage facilities, 16 processing plants and 32 fishmeal extraction plants. Only Gujarat and Maharashtra, India's most developed fishing-states, have more infrastructure (CMFRI 2012).

The technological and economic nature of the fishery has changed drastically in recent decades. In the 1950s, most fishers used small craft and fixed gears such as beach and shore seines. Total catch was low and mostly subsistence — perhaps only 50,000 metric tons (Bathal 2005). The catch went mostly to local markets.

However, in the 1960s and 1970s, Karnataka and other states ambitiously pursued so-called modernization of fisheries, national sales and international exports. Mechanization turned artisanal fisheries into industrial ones, dramatically increasing fish production through the 1990s. The spread of shrimp farming during the 1990s also increased demand for fishmeal produced from pelagics such as sardine further incentivizing fishing. Today's commercial catch includes more than 80 species.

In the mid 1990s, fish production began to dwindle even as fishing effort, space, boats, gears and trip duration increased. A 1980 census counted less than 1,100 mechanized craft in the state (CMFRI 1981), compared to 4,400

counted during the 2005 census (CMFRI 2006), though that number has fallen slightly. Mechanized boat size and power increased from nine meters and 10 horsepower to 20 meters and 350 horsepower or more. In early 2014, fishers reported the arrival of 600 horsepower engines in the fishery. Some trawl fishing trips now last nearly two weeks but many mechanized boats remain concentrated within the state territorial waters.

In recent decades, the motorized fleet has also grown as traditional fishers have added small engines. Governments encouraged the traditional sector to install small outboard engines up to 25 horsepower, allowing them to range farther into the sea. This increases the opportunity for conflict within mechanized gear classes that also fish within territorial waters; many traditional fishers see these larger boats as livelihood threats, though others report abandoning their small craft to become crew on mechanized boats and labor on docks.

According to CMFRI (2013) estimates, Karnataka's annual fish averaged 181,000 metric tons between 1985 and 2005, much below its estimated total annual potential of 425,000 metric tons. Catches have swollen in the last several years; CMFRI data shows annual catches from 2007 to 2011 have been not lower than 280,000 metric tons, with a record of 390,000 metric tons in 2011. High oil sardine catches along the southwest of the country partially explain this boom. Activists argue the cyclical but prolific oil sardine obscures stagnating production (Fernandes and Gopal 2012).

Sustainability is increasingly part of the vocabulary both of officials and fishers (Pillai ed. 2011, field interviews 2012, 2014), as acknowledgement of overcapitalization and potential overfishing spreads. The growing trawl fleet has hurt traditional fishers as well as the trawlers' own catches. Even in 1997, the Karnataka Department of Fisheries reported overfishing in shrimp and other high valued species (GOK). Small-scale fishers complain of trawlers in near shore areas where they are supposedly prohibited. Traditional *rampani* nets, a large community shore seine that once accounted for large portions of the annual catch, have almost disappeared.[3] Traditional and mechanized fishers report good harvest days are becoming less frequent, while Karnataka officials admit that state fisheries are overcapitalized (field interviews 2012, 2014).

State data show a significant decrease in the catch percentage by non-mechanized crafts (i.e. motorized and non-motorized boats), and a consequent

increase in catch percentage by the mechanized fleet. Yet average catch rates for both classes have fallen substantially. The average catch of mechanized units has declined more than 70 percent since a high in 1989-1990, while the average of non-mechanized units has fallen more than 75 percent since a high in 1994-1995. In addition, the overall catch by trawlers — one of the most destructive, indiscriminate gears — has increased, at the expense of other gears. According to statistics provided in the annual reports of state directorate of fisheries, from 1998-1999 to 2006-2007, only trawlers have seen an increase in their percentage of total catch.

Fisheries Regulation in Karnataka: A Historical Perspective

Governance, rulemaking and dispute settlement came mostly from often-caste-based community organizations. For example, older fishers in southern Karnataka report that *mogaveera* village councils enforced a traditional monsoon fishing ban to remove incentives for competition during weather that was dangerous to small craft (interviews 2012).

As noted earlier, fishery development and so-called modernization upended traditional governance. Karnataka focused on increasing fish production for domestic and international markets. Schemes pushed motorization of traditional crafts, introduced mechanized boats and incentivized infrastructure development. In the late 1960s, ice plants and cold storage appeared, and the Dakshina Kannada District Co-operative Fish Marketing Federation began to construct and distribute trawlers. This capital and infrastructure overhaul shook traditional fisher communities that resisted mechanization. Clashes between sectors led to fights, during which traditional fishers burned mechanized boats (Bhatta, Rao and Bhat 2000). Yet the "modernization" process continued, and by 1975, catching mackerel and sardines in Karnataka was an industrial business (Haywood and Curr 1987).

During the 1980s, fishers began to use sonar, mobile phones, radios and GPS navigators. Night fishing, multi-day fishing and monsoon fishing by mechanized boats became regular. Conflicts continued between traditional fishers of near-shore areas, where mechanized boats threatened their sustainability.

Sensing such problems nationally, the central government issued guidelines for reserving areas for different classes of fishing vessels (GOI 1978). Representatives of the *rampani* units, traditional fishers and mechanized boat owners met with officials to discuss fishing zones. In 1978, officials issued the following restrictions (GOK):

1. Rampani units may operate from 15 September to 15 April.
2. Five kilometers from the coast are reserved for rampani and traditional fishers. Small-scale shrimp trawlers may operate up to 1.6 kilometers from the shore only during September.
3. Purse-seine boats may operate beyond eight kilometers from shore.
4. Large trawlers regulated by the central government may operate only beyond 16 kilometers from shore.
5. Night fishing by purse seiners is prohibited.

In 1994, GOK extended the zone reserved for traditional fishers to 10 kilometers from shore, but no restrictions were placed on traditional boats fitted with outboard motors (GOK 1994). Similar spatial demarcations continue to exist today, though their enforcement is questionable.

In 1978, the central government also drafted model fishers legislation for states to follow. GOK passed the Karnataka Marine Fisheries Regulation Act in 1986, creating the present top-down regulatory framework. The act came into force in 1989 and GOK imposed its hallmark rule — a monsoon ban on mechanized fishing for 90 days from June 1 to August 31. Traditional boats fitted with outboard engines remained exempt (GOK 1989). Facing mechanized boat owner outcry, GOK later reduced the ban (which functioned effectively as a fishing season reserved for traditional fishers) from 90 days to 65 days (GOK 2000). The Mogaveera Mahajana Sangha (MMS), the traditional apex caste committee representing more than 140 fishing villages in southern Karnataka, largely acceded to the government order at its 2001 meeting; the MMS resolved that trawl and purse seine boats should not fish from June 6 to August 9, though small boats with engines up to 25 horsepower were exempt. The debate would not end there.

Traditional and mechanized fishers also took the monsoon ban to courts. After officials in Goa reduced the ban there from 90 days to 54 days, a public interest lawsuit in July 2000 asked the Goa bench of the High Court of Bombay to extend the ban to protect the growth of juvenile fish. In September 2002 the court ordered Goa officials to ban both mechanized and motorized craft from fishing within the territorial waters from June 10 to August 15 or *Narlipoornima,* whichever is earlier. The court also called for suspending mechanized vessel licenses, beach patrols, seizure of illegal catch, blocking of fuel sales from jetty pumps and cancelling licenses for fish transport vehicles.

The High Court also took issue with different rules in different states and asked the central government to adopt a fishing ban for the entire west coast. In December 2002, the central Ministry of Agriculture banned monsoon fishing in the EEZ beyond territorial waters of the west coast (including Tamil Nadu) and directed states to agree on ban dates for their jurisdictions (GOI 2003). State ministers gathered in February 2003 in New Delhi though a uniform period never materialized.

Separately, traditional fishers began identifying customary and statutory rules that could offer legal protection from uncertainty in the federal process. In 2003, four traditional fishers from Karwar of Uttara Kannada District petitioned the High Court of Karnataka to prevent fishing by mechanized and motorized boats during the monsoon. In an interim response, the court in July 2003 ordered Karnataka officials to allow only boats without engines to fish during the monsoon. The state issued the ban days later. This went further than many small-scale fishers wanted, as given widespread motorization of traditional craft. Other traditional fishers asked the MMS to pressure the government to consider livelihood implications and again permit boats with small engines to fish during the monsoon. The state conceded, but the High Court of Karnataka, in final judgment in 2004, reversed the government and ordered a complete ban. Traditional fishers formed the Karnataka Coastal Traditional Fishers Association (KCTFA) and successfully lobbied the government to once again allow fishing by boats with engines up to 10 horsepower.

In 2005, influential mechanized fishers convinced Karnataka officials to reduce the ban period from 65 days to just 45 days (GOK 2005a). The KCTFA opposed the additional 20 days for mechanized fisheries and after protests and lobbying both sides reached compromise in June 2005 of a 57-day fishing ban of 57 days for all boats with engines above 25 horsepower. The state government (GOK 2005b) fixed this agreed-to ban from June 15 to August 10. However, that same year, the Supreme Court of India responded to a petition from the Goa Environment Federation by ordering a uniform ban in all west coast states from June 10 to August 15 (67 days), exempting boats with engines only up to 10 horsepower (Supreme Court of India 2005). The Karnataka government then temporarily followed the Supreme Court order, lowering the horsepower exception and extending the ban, but strong lobbying from mechanized fishers reduced the ban to 57 days again.

Mechanized boat owners still argue for a ban of only 45 days on all boats with engines, regardless of size, while traditional fishers want to raise the exception to 25 horsepower and extend the ban to 67 days. Traditional fishers say small engines are needed to travel quickly during adverse weather or range farther away from degraded inshore waters. They also argue the fiberglass boats promoted by governments are bigger and more difficult to manage without engines. Both sides continue to lobby officials on occasion (KCTFA 2006a, 2006b, 2007a, 2007b, 2007c, field interviews 2012).

Despite the Supreme Court's order, neither the ban period nor exemptions were made uniform across states as local politics would inevitably lobby states to essentially defy the court. The door remained open to conflicts, particularly on the west coast (Chari 2014), leading up to the uniform ban period beginning in 2015. The monsoon season is a powerful ecological force in Karnataka fisheries, and the current ban from June 1 to July 31st exempts only small boats up with engines up to 10 horsepower. This idles approximately a quarter of the fishing fleet, though it also acts as a reserved season for largely traditional fishers. There are strong incentives to go to sea during this season, particularly for small fishers whose livelihoods are under threat from social, technological and economic change.

We find that there is less-than-complete justification for the bans as a way to protect breeding species. And, given the uncertainty over fisheries in India, the bans represent protections based on the precautionary principle. We note that these benefits extend to all fishers. Furthermore, the ban continues to act as a reserved fishing season for remaining traditional fishing population (Sehara, Pannikar and Karbhari 1992), who rely upon that time for basic sustenance.[4] Even some fishers who work on mechanized boats also return to traditional craft during this time. There may also be others in the fishery that feels the pinch of the ban, such as idle mechanized crew members and or fishmongers. We, like Vivekanandan et al. (2010) and Mohamed et al. (2013), argue for other policies (e.g. poverty benefits or alternative job creation) to address these problems without attacking a generally accepted piece of fishery governance. That is not to say that this or other regulations need no modifications. Given the above analysis, we would actually support lengthening the ban coupled with compensation for those truly suffer. But in reality the fishing ban during monsoon period has failed to achieve its prime objective as thee is a absence of community involvement in its implementation.

As a result of failure of command and control/top-down approach in implementing the conservation methods, FAO in the year 2013 issued the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries. And, as part of the national programme of International Collective in Support of Fish workers (ICSF) Trust to disseminate and implement the Food and Agriculture Organization (FAO) "Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines)" a state-level workshop was planned and organized by the Coastal Karnataka Fishermen Action Committee on 6 November, 2016 at Malpe, Udupi district. The Coastal Karnataka Fisher men Action Committee, promoted by the apex community organization of marine fishing communities of Karnataka (Moagaveera Mahajana Sabha), took initiatives to involve the representatives of village-level fisher groups by holding pre-workshop meetings in all the three coastal districts in Karnataka—Dakshina Kannada, Udupi and Uttara Kannada. The participants in the workshop included the office bearers of sixty-three associations spread across three districts (Dakshina Kannada, Udupi and Uttara Kannada) of coastal Karnataka which are affiliated to the Coastal Karnataka Fishermen Action Committee, including the Traditional Fishermen Association, Trawl Boat Fishermen Association, Purse-seine Boat Fishermen Association, Deep-sea Boat, Fish Workers Association, fisheries cooperatives, fisherwomen associations, joint director and assistant director of the fisheries department, government officials of Coastal Regulation Zone (CRZ), forest department officials, officials of Central Marine Fisheries Research Institute (CMFRI), representatives of NGOs, president and secretaries of fishermen village.

The Aims and Objectives of the Stakeholder Consultation Workshop

1. Integrate the different forms of fishery management regulations for implementation in order to minimize its negative impacts on small-scale fishers.
2. Modify the present fuel subsidy scheme to benefit small-scale fishers and prohibit destructive fishing practices.
3. Make fisherwomen less dependent on state support schemes through self-empowerment mechanism.
4. Integrate community-based management with increasing diversity of fishing communities.

5. Ensure minimum fishing space for small-scale fishers with increasing non-fishery activities both on the coast and also on the sea.
6. Provide more credible and easily available data on fish catch and allied information for evolving scientific management policies.
7. Ensure a better monitoring and reporting system of fish catch and other climate-related parameters.
8. Mobilize capital and technology and involvement of fishers in transforming present bottom trawling into more sustainable fishing technology which involves huge funding mobilization and involvement of community-based organizations.

The discussions were made on five issues as suggested in the SSF guidelines.

1. Governance of tenure in small-scale fisheries and resource management,
2. Social development, employment and decent work,
3. Value chains, post-harvest and trade,
4. Gender equality, and
5. Disaster risks and climate change.

The group discussions were summarized below which reflect the real concern of the fishers and their understanding of the problems. On the issue of Customary Tenure Rights, the group opined that in most coastal areas, beach space available for fishing activities had declined drastically due to erosion, tourism, setting up industries, climate change, disasters (natural and human made), and other allied reasons. It threatened the livelihood of traditional fishermen as they do not get space for operating shore-seines and also for landing their vessels. They complained that though there are spaces in some areas, such spaces are not available to the fishing activities, especially for fish drying, curing and processing, mainly due to the development of tourism and establishment of industries in the areas. In the past, government reserved (notified) some of the coastal land for fish curing purposes, but today such land are diverted for non-fishing activities. Most of the coastal lands are controlled by the port department; as a result there is a scarcity of land for constructing basic infrastructural facilities at the fishing harbour. They complained that due to the discharge of industrial effluents [Udupi Power Corporation Limited (UPCL), Baden Aniline and Soda Factory

(BASF), Mangalore Refinery and Petrochemicals Limited (MRPL)], pollution level has increased. The Single Point Moring of MRPL, naval base-Seabird projects has led to a decline in the fishing space as areas where fishing is prohibited has increased, thus reducing the fertile area for fish production. It was emphasized that the government shouldn't allow net manufacturing units to manufacture the destructive nets. Fishermen from Karwar complained that the district administration evacuated the sheds in the coastal area, but such lands are not available to fishermen. They pointed out that women were not given preferential rights in tenure rights. Increased sand mining adversely affected the fish production. At Malpe port area whenever the fish curing-land would be leased out, the fisherwomen should be given the preference as they depend on such land for fish drying activities. Asked about what changes have affected the customary tenure rights, the group opined that there is no coordination among various departments of the government and as a result they failed to implement the policies of the government. The group agreed that though we have CRZ Act, it has not been implemented effectively. In the coastal area, permissions are given for developing resorts but not for constructing houses for fishermen. The group demanded that in the coastal area, there must be a reserve space for traditional fishing activities and also for the activities of fisherwomen.

The group reported that they had customary management systems related to scheduling of fishing activities, sequencing of gear use, sale of fish catch, owner-crew relations, controlling destructive fishing in their area and used to take decisions relating to fisheries, including fishing, covering the activities of women, but these systems are no longer functioning effectively. About the government-implemented management measures, the group stated that the sixty-one days fish ban has been in practice and implemented effectively. Though there are rules about Monitoring, Control and Surveillance (MCS) systems, fishing zones, mesh size regulations, destructive fishing, such rules are not implemented. The group reported that by creating more awareness about all such rules and with the cooperation of fishers these could be implemented. They felt that CRZ Notification 2011 is still to be implemented. They opined that under Marine Fisheries Regulation (MFR) Act, when the license is given for fishing boats, it should be for five years, and thereafter it should be renewed every year. But at present the license is operational for only a year and has to be renewed every year. About the implementation of the government-led management measures, the group opined that

management measures are not implemented effectively as the government does not consider the opinions of the fishers and does not allow fishers to contribute while framing policies. The group felt that there is a need for strengthening all organizations and cooperatives of fishers. All the associations should come together under one platform with proper coordination and discuss their problems to compel the government to meet their demands.

The second Group members on Value Chains, Post Harvest and Trade and Gender Equity group members observed that they have their organizations but they were not given a chance to be present in the local decision-making processes relating to fisheries. They remarked that though a few capacity development training programmes were organized for a limited number of people to produce good quality fish and fishery products for both domestic and export markets, there is no support after training and no follow-up from the government. They stated that in most of the landing centres, processing and storage areas and fish markets there is no adequate and suitable basic infrastructure, amenities and services to meet their business and personal needs. The group members spoke about losses in fish supply chains which in turn results in increase in their costs and reduces their incomes. To reduce the loss of quality of fish, the group suggested that fisherwomen must be given big-size icebox and there must be a cold-storage facility at landing centres. Further, they stated that though they are given the icebox through government schemes, they are not available equitably to all of them. The group stated that there is no women group engaged in supplying fish and fishery products to international markets and they are willing to take up such activities, provided there is a support and assistance from the government. The members found that as a result of export of fish to international markets, fisherwomen could not get sufficient fish to trade in the local market which in turn affected their food security. They complained that no timely and adequate market information is available to them to earn better returns. They suggested that at the landing centres fishermen should give preference to fisherwomen while auctioning/selling fish.

The group opined that fear of losing livelihood kept the women away from decision-making process. Further, lack of information, awareness and coordination also constrained the women's equitable participation in decision-making process. They stated that changes in the fisheries sector substantially affected their livelihood in the form of non-availability of fish in adequate quantity, decline in coastal space for fish processing activities, competition

form men traders and growing number of fish retailing shops. The women head loaders found it difficult to sell the fish due to two-wheeler and four-wheeler men retailers. Even in the marketplaces, women lose customers due to an increase in the number of men retailers who cover every nook and corner of the villages and cities. The group complained that as such, there are no specific government programmes/schemes which provide social security and health security to fisherwomen. Schemes like Matsya Mahila Swavalambana Yojane, Savings Cum-Relief Scheme are not big enough to meet or compensate the needs of the fisherwomen. Group accident insurance scheme and distress relief fund are not reaching the people properly. They suggested that there must not be any age restriction while sanctioning benefits (compensation/insurance) to the injured or deceased fish worker under any social security measures. They also articulated the urgent need to formulate a policy to provide rights over coastal land, social security measures (specific to fishermen and fisherwomen engaged in fishing and related activities) and also to extend a credit facility like in the agriculture sector. The group found that though there are organizations at different levels to provide support in their activities, these are not functioning effectively. Proper coordination is required among them.

One of the groups observed that before sanctioning the setting up of an industry in coastal areas, the government needs to discuss the matter with the fishermen organization by taking them into confidence and take suitable measures to retain and develop the fisheries. Steps must be taken to avoid sea and air pollution. Due to insufficient flow of water into sea during the rainy season, the quantum of nutrients available to fish has declined. Therefore, the government should take sufficient measures to retain the forest areas to get rainwater.

Conclusion

Our first order conclusion is that policy desperately needs a directional shift. Top-down management is prone to failure (Kompas and Gooday 2007), and we advocate reviving community management systems, which could assure territorial and livelihood security to coastal fishers. True decentralization of management and development to such locally-based institutions could better support sustainable use and long-term health of natural resources and appropriateness of development (Ostrom 1990, Scott 1999).

International development agencies and even the central government of India have recognized that trust, reciprocity, cooperation and social networks of

local community institutions can lead to economically and environmentally sustainable development. For monsoon bans, officials should strongly consider working through community institutions to locally tailor bans to be most effective for various fisher classes and regionally fisheries, while also brokering agreements across larger geographies to prevent inter-regional conflicts. This also means involving the fishing community in designing and monitoring spatial reservations for different classes. Though not a simple task, we believe this is a viable alternative. Including representatives from fishing communities in the policy process should strengthen public support and buy-in. Simply put, participatory management should be a priority for the government.

Monitoring and research should bring community-level organizations to the same table with government and scientists for joint evaluation and assessment. Fisheries management must link with economic sectors such as construction, industry, tourism and agriculture. Even broad monsoon fishing ban may have little impact if other threats to fishery health remain. A coordinating forum — one that would incorporate all stakeholders — is sorely lacking.

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