A DIALOGUE ON MANAGING KARNATAKA'S FISHERIES

Report on a 3-Day Interaction on Fisheries, Conflicts and Management

dakshin

College of Fisheries organising team:
Dr. Ramachandra Bhatta, College of Fisheries, Mangalore
Sri. S. Gunakar, Assistant Professor, Pompe College Aikal, Kinnigoli, Mangalore
Contact details:
Ramachandra Bhatta, Professor and Head of the Division
College of Fisheries, Mangalore 575 002
Tel: 0824-2243328 / 2213066 / 2249256/ Fax: 0824-2248366/
Mobile: 091-9740022668/ rcbhat@gmail.com

Dakshin Foundation organising team:
Aarthi Sridhar, Dr. Naveen Namboothri, Sajan John and Marianne Manuel.
Contact details:
Dakshin Foundation Flat No 8, Dwarkamei Residency,
2278, 24th Cross Road Railway Parallel Road,
Sahakarnagar C Block, Bangalore, Karnataka 560 092 India.
http://www.dakshin.org

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Cover photo: Sardine landings at Malpe fishing hrabour. (Photograph: Sajan John)
Inside cover: Inaugration of the workshop. (Photograph: Viswanath Reddy)

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Organized by
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Workshop Programme Schedule

Day 1 (8th December 2011)

Registration

Inaugural Ceremony

Session 1:

Introduction to the workshop and its objectives-Ramachandra Bhatta and Aarthi Sridhar(Dakshin)

Management of fisheries – experiences with 'solutions'- Aarthi Sridhar

Group discussions: Identifying the burning issues in Karnataka's fisheries.

Presentation by each group

Session 2:

Community based monitoring – experiences from across the world- Sajan John (Dakshin)

Discussion

Day 2 (9th December 2011)

Session 3: Overview of the marine ecosystems and state of Fisheries

Marine ecosystems - dynamics and linkages- Naveen Namboothri (Dakshin)

State of Karnataka Fisheries- Dinesh Babu (CMFRI, Mangalore)

Discussion

Session 4: Co-management in fisheries

Co-management experiences from Kerala and Tamil Nadu- Marianne Manuel (Dakshin)

Discussion: What role can communities play in the management of Karnataka's fisheries?

Day 3 (10th December 2011) Field session

Field visit to Meenakaliya fishing village to experiment with the idea of 2-way learning processes in fisheries

Group Discussion

Feedback from the participants and concluding remarks

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Introduction

The southern coastal state of Karnataka has a 300 km long coastline with a continental shelf measuring nearly 25000 km^2 (Mohamed, 1998). Referred historically as the "mackerel coast", Karnataka continues to contribute significantly to India's seafood industry. According to the Central Marine Fisheries Research Institute (CMFRI 2005) Karnataka has 37,632 active marine fishers, 170,914 total fisher population, and 15,655 numbers of total fishing crafts. According to Government of Karnataka (GOK 2009) more than 60 per cent of the total fishers are small scale fishers. In 2007-08, 4.24 per cent of the total Indian fish catch was landed in Karnataka. The inherent rich inland waters and rivers at the foot of the Western Ghats, with 27,000 sq km of Indian EEZ are the parts of Karnataka marine fisheries.

A review of sector wise status of marine fisheries over the last decade shows that the mechanised crafts have a lion's share of around 88 per cent in terms of both quantity and value terms. In traditional sector, *Patte-bale* and *Matu-bale* (traditional gears) are the most popular gears and are operated mainly during the monsoon season (June to August). The major catch of *Matu-bale* gear consists of penaied prawns, sardine, mackerel, croakers and carangids. Results shows that the share of non-mechanised/traditional sector declined from 59 per cent in 1977 to 6 percent in 2009. The average catch rate per non-mechanised unit has declined from 1.03 metric tons in 1984-85 to 0.35 metric tons in 2008-09, a decline by around than 3 times. The catch rate of mechanised units has declined from 46 metric tons in 1990 to 12 metric tons in 2008-09. Further, the catch per unit of fishing unit/year has also declined from 17.70 tons in 1976-77 to 12.43 tons per year in 2008-2009 representing a decline of 30 per cent. The attributes of Karnataka's present day fishery, marked by an overall decline in fish catch, increased mechanisation and over-capacity of craft and gear, interact with other social factors to create tensions between different categories of fishing communities.

It is necessary to revisit the existing fisheries management policies and practices within the state. In order to initiate an open debate amongst fishworker leaders and representatives and key fisheries officials on managing the state's fisheries, a 3-day workshop was organised for fishers from three coastal districts of Karnataka and Goa and North Malabar districts of Kerala.

The major objective of this workshop was to start a dialogue among all the stakeholders to identify the burning issues in Karnataka's marine fisheries; to understand the role that each stakeholder can play in sustaining the fishery resource; and the possible solutions that could emerge to manage fisheries such as the idea of co-management.

The principal outcome of this endeavour was to identify specific practical activities for collaborative work between various stakeholders as an experiment in co-management, within the district of Dakshina Kannada.

Format of the workshop

The first day of the workshop began with a formal inauguration facilitated by Dr. Ramachandra Bhatta. The inaugural ceremony was attended by key figures who will be important collaborators for future progress on fisheries co-management in the state. These included Mr.Nithin, Kumar (President KFDC), Mr.Yashpal Suvarna (President, South Kanara & Udupi Dst. Coop. Fish Marketing Federation, Mangalore), Mr. Prabhakara Rao (Secretary, Coastal Development Authority), Dr.Vasudev Byndoor (University Board member) and Prof. K.M.Shanker (Dean, Fisheries College).
Aarthi Sridhar from Dakshin Foundation made a brief presentation titled 'Management of fisheries – experiences with 'solutions' 'to introduce the context of the workshop and its relevance for Karnataka's fisheries. Once the objectives of the dialogue were introduced and discussed, all participants were divided into four groups each having an equal representation from all fishing sectors, the state fisheries department and from the scientific community. The objective of the group discussion sessions was to identify 'burning issues' faced by the marine fishery sector of Karnataka as opined by the participants. After the group discussion, representatives from each group presented their findings of the group discussion and possible solutions for the issues. Sajan John from Dakshin foundation made a presentation titled 'Community monitoring of coastal and marine resources – experiences across the world.' The aim of the presentation was to convey the idea of community-based monitoring and community-based management of marine resources, regions where it has been experimented with, results from these locations and to initiate a discussion on the feasibility of such approaches in Karnataka's fisheries.

Day-2 began with a presentation by Dr. Naveen Namboothri (Dakshin Foundation) on an 'Overview of the marine ecosystems and linkages' followed by a presentation by Dr. Dinesh Babu from CMFRI titled 'State of Karnataka Fisheries' and a presentation by Marianne Manuel (Dakshin Foundation) titled 'Co-management experiences from Kerala and Tamil Nadu'. The presentations aimed to highlight the state of scientific ecological knowledge thus far regarding oceans and seas and served to link biotic and abiotic factors that affect the production of marine resources. The presentation on co-management experiments elsewhere in India reveal the result of participatory experiments that have been initiated in Kerala and Tamil Nadu with the active involvement of fishing communities and state government. After the presentations, an open discussion was facilitated based on the same.

Day-3 was a planned field exercise, with participants venturing into the field to get first hand information on different ways of understanding and interpreting data on fisheries through interactions with communities.

The content of this report has been prepared by the extensive discussions and presentations that took place during the workshop. We have taken the liberty of synthesising the opinions that emerged in the workshop, taking care to set apart divergent views of different groups about the state of Karnataka's fisheries and ways to manage the same.

Concerns with fisheries

In tropical waters with an over-capacity of fishing vessels and fishing effort has been a long standing concern. This 'over-mechanisation' causes not only a class divide between the fishing communities but also places an undue strain on the marine ecosystem. The traditional fishers either become adversaries, demanding explicit rights from the state or end up joining the labour force of the mechanised fleet.

Scientific studies have shown that the over-exploitation of higher trophic species from an ecosystem will adversely impact the trophic structure of a complex ecosystem (Pauly et al; 2000). The uncontrolled removal of top predators results in an imbalance in the populations of species down the food chain, resulting in a profusion of some species and a decimation of others. Most the fisheries management initiatives now focus on ecosystem-based fisheries management (EBFM) rather than on single species management. This impacts the availability of other commercially important fish species.

Karnataka's fisheries show the symptoms of over-exploitation and its concomitant impacts. At present most fishers (particularly from the traditional sector) are surviving not because of their catches but because of the increasing price of fish. The number of mechanised crafts and the intensity of fishing operations in the state suggest that the present day regulations are unable to manage the fisheries equitably or sustainably.

Transitions in fishing technologies and methods

India has witnessed the transition in its fisheries from a local subsistence economy to a global export-driven industry since the introduction of mechanisation in the 50s. In order to enhance production new technologies were ushered in through various bilaterally aided projects such as the Indo-Norwegian Project and Indo-Danish cooperation. Mechanisation in Karnataka's fisheries started in the mid 1970's. Over the last five decades, newer technologies evolved and were incorporated into the fishery sector. Today there is a mechanised fishing sector comprising mainly of trawlers and purse seiners and an active motorised sector which considers itself the traditional sector on account of the non-mechanical manner of laying deploying nets, among other social factors.

The trawlers in Karnataka are of three types; small, medium and large, based on their Length Overall (LOA). Earlier, there were only single-day trawlers, but due to the erratic catch and dwindling profits, single day fleets are being converted into multi-day fishing fleets operating for 7-8 days at a stretch at depth reaching 100m. There are around 1400 trawlers in Dakshina Kannada and Udupi districts. Of these nearly 70% are deep sea trawlers (multi-day) and the remaining 30% are single-day trawlers, mainly catching shrimps. The multi-day trawling operations also land a significant amount of trash fish as bycatch and this is sold to poultry feed industry. Un-controlled landings of bycatches have opened a new market for a variety of products made from trash fishes and its value sometimes exceeds that of low value edible fishes. High speed engines (200-400 HP) are employed these days to target fast moving pelagic fishes that are difficult to catch with 40-100 HP engines. In the words of the fishers, these engines are designed to go as fast if not faster than the fish themselves. Generally, medium and large trawlers use high speed engines. Pair trawling or bull trawling is another method which has been practiced in Karnataka's waters. Boats having more than 100 HP engines are used for bull trawling. Bull trawling takes place in both coastal and deep waters. Maximum trawl landings are during the month of August –September. Mechanisation has introduced with it a whole slew of management challenges, considering that the LOA of vessels has increased more than 20m and engine capacities have jumped from 140 HP to 450 HP.

Karnataka boasts of the largest purse seine fleet in the country (Mohamed, 1998). 'Purse seiners' as they are known, are mainly operated from major fishing harbours in the state. Nowadays, mechanised boats in Karnataka operate purse seines during the peak fishing season and go for multiday trawling during the rest of the fishing season. Very large multi-day purse seine units with a fish hold capacity ranging from 12 to 20 tonnes, using high speed engines (>300 HP) are also operational along with multi-day long liners targeting sharks. Further, purse seines targeted mackerel in the near shore as well as deeper waters, and seer and tuna in deeper waters using large meshed heavier and faster sinking nets.

Changes in the fisheries demography

From early accounts, the practice of fishing and its business was small scale and community oriented with a minimal role for 'outsiders' in the operations. Fisheries today however bear little resemblance to this practice, having transformed into a full scale global enterprise. People from non-fishing castes have not only entered the sector but are showing trends of dominating the market. Fishers from traditional fishing castes allege that these new entrants carry on their business without acknowledging the ecological services and goods provided by the sea. They claim that this attitude by this group has depleted fishery resources in their waters. It is believed that these 'outsiders' will find a way out if the fishery resources vanish leaving the traditional fishing communities at an absolute loss.

Fisher participants at the workshop (largely from the mechanised sector) stated that fishing vessels from other states and the migration of fisher folks from adjoining coastal states into Karnataka pose a serious threat to the livelihoods of Karnataka's fisherfolk. Fishers from Kerala, Tamil Nadu, Goa and Maharashtra fish in the coastal waters under Karnataka's jurisdiction (12 nautical miles from the shore). Participants asserted that the middlemen (also 'outsiders') in the fishing business often provide these migrants fake registration certificates (RC) and documents to enable them to procure subsidised fuel. They said that the 'unscientific' method employed by fishers from Tamil Nadu to harvest cuttlefish has depleted these resources. The fishers stated that cuttlefish lays their eggs 20m offshore in rocky bottom areas. Fishers from adjoining states come to these areas and deposit coconut fronds here. The decaying fronds attract cuttlefish from the nearby areas and after 15 days the Tamil Nadu fishers come in groups and harvest cuttlefish aggregations using hooks and lines. Apparently nearly a ton of cuttlefish is extracted per day during this kind of fishing operation. Participants from the mechanised fishing community were vocal that this fishing method employed by the Tamil Nadu fishers be banned since it is highly selective and targets gravid females.

Trends in fish catch

a. Fishery scientists' views

The marine fish landings data of CMFRI for Karnataka shows an increasing trend for the past five years with record high of 3.32 lakh tonnes during 2010. The total fish catch for the year 2010 was 16% higher than the catch recorded in the year 2009. The mechanised, motorised and the non-mechanised sectors contributed 90.7%, 8.1% and 1.2%, respectively to this figure. While the production by the mechanised sector has increased, production by motorised and non-mechanised sectors have registered a steep decline. The trawl net was the major fishing gear employed and contributed 61.7 % of the total catch during 2010 followed by seines (33.2%) and gillnets (2.9%) operated from motorised and non-mechanised boats. Estimating the growth and stock parameter of

24 dominant commercial fish species revealed that the exploitation ratio was higher than desired levels for most species (CMFRI, 2011).
Studies on bycatch landings show an estimated 25,067 tonnes of low value bycatch (LVB) valued at Rs. 25 crores was landed by the multi-day fleet (MDF) at the Mangalore Fisheries Harbour. The percentage of discards was highest during the monsoon and post-monsoon season. While the quantity of discards has been showing a declining trend, the landed bycatch volume has progressively increased. The increase in bycatch landings by multi-day trawlers is driven by a high demand for trash fish by poultry feed manufacturing units (CMFRI, 2011).
Against a backdrop of a high exploitation ratio beyond desired levels and a thriving bycatch industry the availability of commercial species of fish for the motorised and non-mechanised sector is dwindling. This poses a serious challenge to the livelihoods of several fisher families in the state. Excessive landings of bycatch can affect the trophic structure of the marine ecosystem with catastrophic impact on fisheries (Hall et al; 2000). Karnataka's fisheries is at a stage when serious intervention is required to control the over harvesting, over-capacities in the fisheries and the problem of bycatch in fisheries.

b. Fishers views

The drastic decline in fish catch has not escaped anyone's notice. A decline has been noticed in multi-day trawl landings of pink perch (*madmal*), squid and cuttlefish. silverfish, threadfin breams and crabs which are landed from in-shore fishing operations also show declining trends. Purse seine catches of *tede, anjal* and Chinese pomfret also record declines. Traditional fishing methods using hook and lines are now obsolete with no one adopting these fishing techniques.
At the time of the introduction of trawlers *sigadi* (shrimp) was abundant. Thereafter cuttlefish and squid dominated the catch. Overall there has been a decline in varieties of prawn catch (the catch of *karkadi* has reduced almost by 90%). *Tembel* has seen a 70% reduction, '*brown'* has reduced by 95%, and the catch of *'white'* is also declining to a large extent. With the reduced demand for shrimps, fishing operations now mainly target squid and cuttlefish a fishery itself on the decline.
The major catch in purse seiners and gillnetters are mackerel, sardine, ribbon fish, pomfret, tuna and seer fish. Modern navigation and fish finding devices like GPS and echo-sounders make the task of locating fish fairly easy. Trawl operations are considered to be problematic by purse seiners and gillnetters but the fishers at the workshop placed hope in local level dialogue to resolve conflicts. Traditional fishing by the *nadadoni* craft is carried out during the monsoon season. A decade back, fish catch was fairly good by this category of fishers who are now at the receiving end of an intensive mechanised fishing.

Regulations for fisheries management

Most of the existing fisheries management regulations largely remain on paper. The only effective fishing regulation that is followed at present is the monsoon trawl ban. This is because this is a harbour-based regulation. Lack of community support or lack of community consultation during the formulation of fisheries regulations is one the major reasons cited for its overall failure. Lack of enforcement also contributes to the failure of certain regulations such as limits on mesh size, landing of protected species, encroachment by mechanised vessels into traditional fishing grounds and the operation of other state fishing vessels in Karnataka's waters.

Participants from the fishing communities stated that the representation from each of their groups should be mandatory while designing fishing regulations. They feel that their involvement will help in the implementation of regulations since they have the experience of their industry and can suggest practical solutions. Participants stated that the central government should constitute a separate ministry dealing with the marine fishery resource and management.

Fisheries infrastructure

Good fish landing centres and harbours are necessary for a thriving fishery. The Karnataka coast has 88 major and minor marine fish landing centres. The existing landing centres are not adequate to dock and land fish and cater to the increased fishing fleet. Major harbours are mainly occupied by mechanised fishing crafts. There is a persistent demand from fishers (mechanised and motorised sector) to increase the number of landing centres with docking and berthing facilities.
Similarly the post-harvest processes require functional ice plants, freezing plants and canning plants. The fishers also stated the need for bycatch processing units such as fish meal plants and for fish processing plants to be located in coastal areas of Karnataka. These units could be involved in the manufacturing of value added products and for processing of fish oil etc. Among these facilities, auctioning and marketing facilities need urgent attention according to the participants. Save for the major landing centres and harbours, auction facilities at small landing centres are poor. The auction of fish either takes place on the road side or fisherfolk have to transport the catch to major landing centres. This appears to be an uneconomical use of time and money. Participants at the workshop stated that the construction of auction halls in small fishing villages can improve overall hygiene, attract more customers and will save money and time presently spent on transportation.

In coastal Karnataka, fish marketing was mainly carried out by women retailers. Nowadays men are also active in fish marketing. This has reduced opportunities for women since men use motor cycles for door to door sales which make them deliver fresh fish faster to customers. Mass transport system for women retailers can be introduced to cope with the growing competition from their male counterparts.

Factors affecting the marine ecosystems

Pollution is a major factor adversely affecting the health of marine ecosystems. Uncontrolled discharge of un-treated industrial effluents containing toxic compounds and hydrocarbons into near shore waters affects the diversity and abundance of fishery resources as well as other benthic and pelagic biota. The direct discharge of domestic sewage is also known to affect marine life. High nutrient influx to the coastal waters triggers toxic plankton blooms. All these factors work against the interest of the livelihoods of coastal fishing communities.

The workshop participants were concerned about the pollution caused by the Mangalore Refineries and Petrochemical Limited (MRPL), Baden Aniline and Soda Factory (BASF), Mangalore Chemical and Fertilizers (MCF) and by the upcoming oil based industries of Mangalore Special Economic Zone Ltd. (MSEZ). They allege that the pollution from these industries is one of the main reasons for fish decline in the area.

Near shore coastal infrastructure development is another cause of worry. These developmental activities affect the traditional land use rights of local coastal communities. The day-to-day activities such as landing or docking boats and fish drying etc can be hindered due to unregulated coastal expansion and development (Rodriguez, 2010). Certain forms of coastal construction are known to exacerbate beach erosion.

Workshop participants recommended that the impact of any kind of coastal development or coastal polluting activities should be studied carefully and project proponents should consult local governing bodies and coastal fisher communities prior to the initiation of coastal works.

Community involvement in fisheries management

Following the tradition of management in other parts of coastal India, Karnataka also adopts a top-down approach in its marine fisheries management. Rules and regulations related to fisheries are formulated and designed mainly by government agencies in consultation with state/central fisheries research organisations. The fishing communities and their traditional organisations are not involved in any decision-making related to the management of fishery resources and other infrastructure development. Communities however practice management related activities at the local scale and the value of these mechanisms is neither understood nor appreciated by state agencies.

The fishing community members at the workshop look toward a change in this approach of state-controlled decision-making and demand their right to participate in fisheries management. Communities have expressed their interest to participate in decision-making related to enforcement, issuing boat licenses, subsidies and managing access to fishing grounds.
The community representatives stated that enforcement of fisheries rules is not adequate to tackle the issue of 'illegal' fishing by fisher of other states in Karnataka's fishing grounds. They believe that the newly formed coastal police force, the Coast Guard or the officials of the state fisheries department does not take this issue seriously. On the other hand, they strongly believe that fisher communities themselves have the capability to protect Karnataka's fishing grounds and can prevent fishing by other state fishers successfully.

The participants feel that the number of mechanised and motorised crafts currently in operation is more than adequate and any further additions will only put additional pressure on strained fishing resources. The state fisheries department should therefore consult fisher communities before issuing permits for new fishing crafts. They stated that permits should only be issued for persons hailing from the fishing community.

Co-management

Co-management refers to the sharing of responsibility and or authority between the government and stakeholders to manage a common resource (Jentoft, 1989). Co-management is not a new concept. It has been followed and practiced across the globe and in many parts of India also – in both aquatic and terrestrial ecosystems. Co-management has shown better results in areas previously governed solely by a top down approach. The effective power sharing between the primary stakeholders and the enforcing agencies through co-management arrangements aims at building trust and a long term engagement of various stakeholders over the problem of resource management.
There is scope to experiment with an approach towards co-management even with Karnataka's marine fisheries sector. Fishing communities here bear a great of knowledge not just of their own industry but of challenges facing the same and potential solutions. The participants at the workshop stated in clear terms the need for lasting and tangible solutions and stated clearly their own commitment in developing the same. Participants from the scientific community spoke of the importance of information on the resource and were keen to explore data sharing mechanisms and agreed on the need for collaborations for better management of the diminishing fisheries in the state. Government departments are not unaware of the fisheries crisis and much is dependent on the state's willingness to engage in power sharing arrangements. Participants agreed on the need to carry forward the debate on co-management and think up specific areas in fisheries where such an experiment could be initiated.

Community-based monitoring and fisheries management
Day 3 Field Visit

The value of traditional knowledge in the management of resources has come to be accepted globally by academics, fisheries scientists and government bodies in some countries too. Most often information on fisheries is collected, interpreted and understood by scientists or government officials who construct meanings of the state of fisheries that might be quite different from the views of fishers themselves. In order for participants of the workshop to be able to appreciate different ways of viewing fisheries and its concerns, a field based exercise was planned.

The third day of the workshop was dedicated to a field visit to Meenakaliya fishing village. Meenakaliya fishing village is near Baikampady, 7 km north of the Mangalore fishing harbour in Dakshin Kannada district. The fishing population of Meenakaliya is dominated by the *Mogaveera* community. Traditional *nadadoni* crafts and motorised crafts operate from this fishing village. Motorised crafts mainly use gill nets to catch mackerel, pomfrets, sardines, croakers etc. The traditional shore seine known as the *rampani* is still used here. The final day field activity was organised with the objective of gaining an understanding of what community-based monitoring involved and how to incorporate fisher's knowledge in the overall appreciation of fisheries. The field visit was attended by 15 participants. The whole exercise was designed to be a "learning by dialogue" activity rather than a one-way data collection process. The duration of the field exercise was from 0730Hrs to 1130Hrs (IST). Participants were divided into four groups each consisting of 2-4 members and asked to collect as much information that they thought was relevant for the management of fishery resources. They were free to employ whatever method they wished to collect this information. They were also given the freedom to speak with whoever they wanted to obtain information. The time allotted for data collection was limited to one and half hours.

After the data collection period, a group discussion was organised with all the participants and village representatives to discuss the findings. Shri. K. Gunakar, from Pompee College facilitated the group discussion. Each group presented their results based on the field observations and interview with the community members. The suggestions from the communities were also recorded during the discussion.

The summary of the discussions are presented here:

- All the groups interacted with fisherfolk during their data collection activity. They spread out and interviewed fisherfolk during post-fishing operation, post-marketing operations and also spoke to some auctioneers.
- The groups interacted with the fisherfolk and collected information on a number of topics. A few of these topics were: the duration of fishing operations, fuel consumption per trip, commission charges to auctioneers, money lenders, women SHGs, near-shore mechanised fishing operations, main fishing gears in use, changes in gear use patterns according to season, fishing by adjoining state fishers, illegal fishing (cuttlefish harvesting), existing subsidies on fuel, role of family members in fishing activity and infrastructure and logistics for marketing activities.
- The group comprising fisherfolk representatives collected more information relevant to the management of fishery resources. They collected information on items such as fishing expenses compared to catch profit, the impact of coastal development and support from central and state agencies etc.
- During the field activity the community members suggested that the information on several community welfare schemes offered by the central and state agencies is not reaching them. They mentioned that some sort of information disseminating mechanism should be initiated. This was not mentioned by any of the participants in the two day discussions suggesting the need to corroborate and supplement information from key representatives in fisheries with information from settlements and the ordinary fisherfolk families.

- Community members felt that fishers should be involved in decision-making for fisheries management. Most of the decisions are made without their knowledge and the formulated laws are difficult to follow. The practical knowledge held by fishing communities will help in designing effective management policies.
- Areas that the community felt that they could immediately assist in data collection were:
  - Presence of new/ exotic species in their catch (provided training in identifying the exotics)
  - Number of non-Karnataka boats operating in their fishing grounds.

Lessons learned during the field exercise:-

- Certain questions asked by the groups did not appear to be directly relevant to fisheries (such as questions related to the caste and religion of mechanised fishing operators). However it needs to be remembered that fishing activity in Karnataka is mainly dominated by the *Mogaveera* community and the difference in who they consider a legitimate fisher is a question of identity. Thus information on the social identity of fishers is indeed related to the subject of fisheries management.
- The previous experience and background of a person engaged in data collection makes a difference to the nature of questions asked and the information collected.
- There is a need to build relationships with the community before one conducts any sort of data collection which might be considered intrusive and extractive. The common complaint is that most of the information collected by scores of students and researchers feeds esoteric reports and theses and none of this information is ever shared in a relevant form with the community. This trend needs to be reversed if we are to consider co-management and other power sharing arrangements to understand and manage fisheries differently.
- Sensitivity should be employed when speaking with fisher women. A gender neutral perspective in interactions with women and men will not necessarily yield beneficial results.
- Meeting with the village head or leaders at the outset of starting any work in a village is beneficial and also respectful of our presence in someone else's space.
- An initial set of meetings were held with the villagers and leaders in Meenakaliya helped us state the objective for the interaction and this benefited our final outcome.

The discussion with the members of the village community revealed the necessity for regular resource monitoring. The community members stated that there were no monitoring mechanisms to quantify the landings of undersized commercial fin and shell fishes, which can affect the fishery adversely due to the usage of small meshed gears. Therefore they recommended that monitoring of undersized commercial fishes also should take place. However, the communities are not sure about their role in the resource monitoring.

This field exercise provided an opportunity to the participants to realise the importance of community knowledge of their areas, the importance of regular monitoring with the involvement of communities, how questions could be designed, the value of fisherfolk undertaking the data collection themselves, who might be holders of knowledge in communities and the importance of building mechanisms to incorporate community based information into decision-making.

Recommendations

The first and second day of the workshop was devoted to facilitating a dialogue among participants on the core issues related to fisheries. During the first day, participants were divided into four groups. Each group consisted of representatives from mechanised fishing, motorised fishing, traditional fishing, state fisheries department and scientific community. Each group had a facilitator and towards the end of the discussion, the group representatives made presentations summarising the discussion points. On the second day, an open discussion was facilitated with all participants where each of the previous day's group recommendations were discussed and decided upon by the group as a whole. We present below the final recommendations of the participants on various aspects related to fisheries in Karnataka.

1. Interests of small scale fishers

- The *nadadoni* sector bears the brunt of the over-capacity and over-exploitation by other categories of fisheries in the state. This fact needs to be recognised and specific measures should be taken to safeguard their interests.

2. Community rights in regulation

- Any decision related to marine resources and its management should be done in consultation with fishing communities and their organisations.

3. Fisheries closures

- It would be beneficial to all concerned if a fishing holiday was declared for 90 days rather than the 57 days in practice now. Since the *nadadoni* cannot operate during rough weather, this sector loses many fishing days and the fishing holiday idea must be equitable and apply to all fishers. This will have benefits for the mechanised sector as well who can reap profits from such a uniform ban on all categories of fishing.
- The fishing ban across the west coast should be uniform during the breeding season.

4. Coastal development and pollution

- The government should implement the ban on discharge of polluting industrial effluents and domestic sewage into the sea. The participants insisted on a "zero effluent discharge" policy to be adopted by the Karnataka government for coastal areas.
- No mega industries which adversely affect the coastal and marine ecosystem should be allowed in the coastal region.
- Polythene is a major pollutant of seas and harbours. The use of polythenes must be strictly controlled. This includes plastic bags, carriers, broken nets, and so on.

5. Fisheries infrastructure

- Fuel quota for motorised boats should be increased from 180 l to 400 litres.
- Fisheries based infrastructure must be improved and the number of landing centres should be increased. Dredging must be carried out as and when necessary in existing fishing harbours.
- Cleanliness and hygiene at landing centres must be maintained rigorously. On site training and capacity building programs on food-industry regulations, sanitary and marketing related aspects should be undertaken by the research and development organizations for the benefit of all stakeholders in fish marketing. The fishers acknowledge the growing competition by

the organized retailers in selling fresh fish and also efforts made by Karnataka Coastal Development Authority to construct modern fish markets exclusively for fisher women.

- Volatility in fuel price is a major cause of concern; to tackle this issue alternative fuel source (such as bio-fuel) should be tried.
- The ongoing process of market construction should be continuously monitored by fishermen community (politics should be kept out).
- The fishermen co-operative societies should be included in the development of harbour and market infrastructure.

6. Regulations for fishing

- The central government should constitute a separate ministry dealing with the marine fishery resource and management.
- Coastal policing must be implemented and fisherfolk must be involved in protection measures.
- The Coast Guard should take action against other state vessels encroaching to the Karnataka fishing grounds. They have received complaints in the past and have shown only inaction thus far.
- In the adjoining states of Maharashtra, fishing vessels from other states can only operate 12 nm from the shoreline and they are not allowed to land or sell their catch in any of the landing centres or markets in Maharashtra. In Karnataka, there are no laws to prohibit such activities. This situation should be changed.
- The minimum mesh size should be increased and the regulations on mesh size should be implemented. Ideas were suggested for adopting a square mesh rather than diamond shaped to avoid juvenile fishes from getting entangled into nets.

7. Regulations in boat capacities and number of boats

- The length of the boats and engine capacity should be regulated.
- At present competition is high because of a large number of boats operating. The number of boats should be regulated by the State Department of Fisheries by making use of the provisions of the Karnataka Marine Fisheries Regulations Act.
- Licenses should be given to new boats only for applicants who have registered their profession as fishing and not to others. In other words only those from the fishing community should be permitted to fish or own vessels.
- A strict ban should be issued on the import of high speed engines for fishing purposes.
- A fishing limit for each vessel has to be decided and enforced by the government with the involvement of the local community.

8. Regulation in fishing practices

- Un-sustainable methods of cuttlefish harvesting by migrant fisher folks should be dealt with strictly.
- Night fishing trawlers and longliners should be banned.
- Bull trawling (pair trawling) should be banned.
- Fishers from other states are encroaching on Karnataka's resources and there are no laws to prohibit such activities. The state's own laws and central legislations for fisheries should evolve policies and rules that prohibit illegal fishing practices by fishers in other state waters.
- The trawlers should not venture into sea while the purse seiners are out in fishing operation. There is already a mutual understanding of the same but this must be adopted in all parts of the state.

- Foreign fishing vessels should be prevented from entering Karnataka waters during the monsoon ban period. The practice of targeting sharks using long lines by Tamil Nadu and Kerala fishers should be prohibited.

9. Women's welfare

- Fisher women must be provided with basic marketing facilities.

10. Role of fisheries department

- The fisheries department must take an active role in promoting fishing, rather than adopting a role of being just a mediator for various government facilities.
- Extensive changes have to be brought about in the fisheries department.
- Export oriented activities should be enhanced.
- A knowledge resource base has to be prepared for sustainable utilisation.
- National level recognition/ approval should be given to the fishing limit prescribed by the local community.
- Minimise the use of modern equipments in locating fish such as fish finders.
- Government and scientific organisations should carry out detailed studies on the biology, breeding season and breeding ground of commercial fishes.
- Fisherfolk are largely unaware of the existing welfare schemes by the state and central government and other agencies. As a result only some members benefit while the large majority is unable to avail of such benefits due to them. Mechanisms for disseminating this information are necessary.
- Welfare schemes/programmes should be initiated at gram panchayat level and then adopted at high levels of administration such as the taluk, district, state and the national levels. The implementation of state/central schemes and issuing new license to the boats should be done after consulting the fishing community representatives.
- Currently, permission is given to new boats without physical verification by the fisheries department. The fisheries department should make sure that all necessary documents such as registration certificate, technical feasibility and insurance records are intact before issuing license to the new boats. Ration card must be verified by the fishery office. Mechanisms for transparency in these operations and procedures are necessary to ensure that the communities are aware of the activities of the department.
- The state fisheries department should have an understanding with the Coast Guard (under the Ministry of Defence) for search and rescue of the fisheries vessel during fish operations during cyclonic and choppy weathers.
- When fishing is not possible, the government should encourage and ensure alternative source of livelihood (eg. cage culture).

11. Role of the College of Fisheries

- The results of the research conducted by fisheries college students that are relevant to the fisherfolk should reach the fishing community. Such findings should be shared as a compulsory part of the dissertation submission procedure.
- Annual extension programs should be well publicised in advance to reach the fishers small smaller towns and villages.
- The state run Fisheries College should have a representative from the fishing community in its Board of Management.

Follow up action must be undertaken to move this dialogue further. A copy of the proceedings and decisions taken should be disseminated to each participant. The recommendations from this workshop should also be sent to the state government.

Conclusions

To state that the marine resources of Karnataka are vanishing and that fish catch is drastically declining is not an alarmist viewpoint. Decline in fish catch and increasing mechanisation and competition has placed the entire sector in a precarious position. The stakeholders from scientific community, from the state fisheries department, from various categories of the fishing communities, export agencies; conservationists have different opinions on the reason for such declines and profess different solutions for each problem. However, in a system where a one-sided top-down approach alone is employed 'solutions' advocated by one stakeholder group finds little favour with other groups. The lack of multi-stakeholder involvement in decision making produces only an impasse.
This workshop was a step forward away from such a situation and aimed at facilitating community participation and rights over fisheries management in the state. The response from workshop participants was enthusiastic with representatives from all fishworker organisations particularly looking forward to a dramatic change from the existing approach of state dominated management. The discussions from the two day interactions provided valuable practical suggestions and options which must be incorporated into management practice. There is tremendous scope for a series of multi-stakeholder pilot projects to be undertaken in the state. These social experiments where fishing community organisations play a key role in fisheries management components have the ability to demonstrate effective management solutions.

All participants were largely positive about the idea of participatory resource management and from within the participant list, there are already a number of willing and enthusiastic entities and individuals who can be partners in this exercise. A series of regular meetings were planned at the workshop to take forward this energetic dialogue from Dakshin Kannada to other parts of the Karnataka coast. As a next step this comprehensive report with suggestions shall be submitted to Akhila Karnataka Kriya Samhiti which represents various fishing groups would meet and discuss the recommendations that emerged from this workshop.

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List of participants

No.	Name	Designation	Organisation
1.	Sushmitha Rao	Asst. Director of Fisheries	Dept of Fisheries, Karnataka, Mangalore
2.	Vasudeva Salian	Malpe fisherman	Malpe Fisherman Association
3.	Chandra H.S.	Programme manager	MPEDA, Mangalore
4.	Swathi Lakshmi	Senior Scientist	CMFRI, Mangalore
5.	S.C. Hemantha Raju	Deputy Director of Fisheries, Karwar	Dept of Fisheries, Karnataka, Karwar
6.	Dr. Smitha P.G.	Freelance Translator	Bantwal
7.	Dhananjaya		KFDC, Mangalore
8.	Dinesh Karkera		
9.	M.Sudhakar		
10.	Narayana K.A.	SRO	NETFISH-MPEDA, Mangalore
11.	Sharath Guddekopla		Traditional Fisherman's Association, Suratkal
12.	Dr. B.R. Manguratha		Dept of Marine Geology, Mangalore University
13.	Jose Francisco De Souza	Traditional fisherman	NFF Goa
14.	Purushotam		FishMark, Mangalore
15.	Suresh Chandra		FishMark, Mangalore
16.	B. Prabhakar	Thokkotu	Mangalore
17.	Lokeshnath B		G.F.G. College,
18.	Dr. Krishna	HOD, Dept of Commerce	SDPT College
19.	Basavaraj P.M.	Technical Advisor	Coastal Development Authority
20.	M.L. Doddamani		Udupi District Co-op Fish Marketing Federation
21.	Hereyanna T Kidiyoor	President	Malpe Fishermen's Association
22.	Dr. Dinesh Babu	Senior Scientist	CMFRI, Mangalore
23.	Dr. Gagadhara Gowda	Professor, Dept of Aquatic Environment and Management	College of Fisheries
24.	Umakanth G. Hoskata		N.K. Fish Federation
25.	P. Sanikatta		N.K. Fish Federation
26.	Kalidar Naik	Fisherman	NFF Goa
27.	Ganapathi Kotair		Mogaveera Patna Ullala
28.	Perugrun D Souza		
29.	Dr. V. N. Nayak	Dept. of Marine Biology	Karwar
30.	Uday R. Nayak		
31.	Upendra Hosbet	Hon.president Karnataka karavali traditional Fishermens federation Suratkal	
32.	Yashodaro. K		
33.	Ramesh S. Kukar	Director	SKEDK
34.	Sathish R. Saha		SKEDK, FishMark
35.	Shinaji S.	Drector	SKEDK Fishermen's

			Federation
36.	K. Prabhakar Rao	Secretary	Coastal Development Authority
37.	Kavitha Prashanth	Asst. Director of Fisheries, Udupi	Dept of Fisheries, Karnataka
38.	Sudeer Shriyeni	Fisherman, Suratkal	
39.	Rohilokshi		
40.	Harishchandra Mendon		Trawl boat Association
41.	Harish Bykampady	Director	S K Udupi district Fishermen's Federation
42.	Sudhakar Kurde	Vice President	MYPD Society, Malpe
43.	Prabhakar Suvarna	Fisherman, Malpe	
44.	Mahesk Kumar U	Asst. Director of Fisheries	Dept of Fisheries, Karnataka
45.	Nagesh Bolar		M. T. B. Coop Society
46.	Shekar Kancham		M. T. B. Coop Society
47.	Rasheed A Bolar		Bolar Farms
48.	Chitan Bengle		
49.	Praveen		
50.	Vasudev Karkern		Fishermen's Society, Malpe
51.	Naveen Karkera	President	Karnataka Purse seince Mernugara Sangh
52.	Gangaothar	Secretary	Mahajan Sangha
53.	Mohan	Committee member	
54.	Purushotama kanchan		
55.	H. N. Anjamayaapa	Dept of FRM	College of Fisheries
56.	Kiran kanchan	Fisherman	
57.	John. B. Sequiera	Dept of Sociology	St. Philomena College, Puthur
58.	Ramachandra	Secretary	Byndoorvala Nadadoni Sangh
59.	S. Gunakar	Asst. Professor	Pompee College
60.	Chandrakanth S Balegar	Director	N K district Fishermen's Federation
61.	Ramachandra	Director	MYDMPSS
62.	Dayanand Ullal	Trawl Boat owner	
63.	Shermona	Trawler	
64.	Suryakanth	Secretary	Fishermen cooperative society
65.	Chandrahasa		Fishermen cooperative society
66.	Viswanatha B S	Senior Reserch Fellow (NAIP Project)	College of Fisheries
67.	A Devi VaraPrasad Reddy	PhD scholar	College of Fisheries
68.	Mahesh V	PhD scholar	College of Fisheries
69.	Sathish H Badami	Asst. Professor, Dept of Fishery Engg	College of Fisheries
70.	Pradeep Doddamani	PhD scholar	College of Fisheries
71.	Akhila D S	PhD scholar	College of Fisheries
72.	Dechamma MM	PhD scholar	College of Fisheries
73.	Rajesh Moger	PhD scholar	College of Fisheries
74.	Milind B Katare	MFSc Scholar	College of Fisheries

75.	Kamalesh panda	PhD scholar	College of Fisheries
76.	Abhiman	PhD scholar	College of Fisheries
77.	Mohan SA	PhD scholar	College of Fisheries
78.	Vijay AR	PhD scholar	College of Fisheries
79.	Chethan N	PhD scholar	College of Fisheries
80.	Jagadeesh TD	PhD scholar	College of Fisheries
81.	Manjunatha Reddy	PhD scholar	College of Fisheries
82.	Jitendra Kumar	MFSc Scholar	College of Fisheries
83.	Praveen GP	MFSc Scholar	College of Fisheries
84.	Muttappa Khavi	MFSc Scholar	College of Fisheries
85.	Banu S	MFSc Scholar	College of Fisheries
86.	Nayana P	MFSc Scholar	College of Fisheries
87.	Bhagyashree Ingle	MFSc Scholar	College of Fisheries
88.	Ramachandra Naik	Assc. Professor, Dept of Aquatic Environment and Management	College of Fisheries
89.	Lakshmipati	Asst. Professor, Dept of Aquatic Environment and Management	College of Fisheries
90.	Livi Wilson	MFSc Scholar	College of Fisheries
91.	Manjulesh Pai	MFSc Scholar	College of Fisheries
92.	Mohit Kumar Ram	MFSc Scholar	College of Fisheries
93.	Himanshu	MFSc Scholar	College of Fisheries
94.	Aathreya H.J	MFSc Scholar	College of Fisheries
95.	Naveen Kumar B.T	PhD scholar	College of Fisheries
96.	Ramachandra Bhatta	HOD, Dept of Fishery economics	College of Fisheries
97.	Aarthi Sridhar		Dakshin Foundation
98.	Naveen Namboothri		Dakshin Foundation
99.	Marianne Manuel		Dakshin Foundation
100.	Sajan John		Dakshin Foundation

List of fish and fishing gears in operation

Si. no	Kannada name	Common English name
Fishes		
1.	*Madmal*	Pink perch
2.	*Manji*	Pomfret
3.	*Tede*	Cat fish
4.	*Anjal*	Seer fish
5.	*Kane*	Lady fish
6.	*Payya*	Gerres
7.	*Sigadi*	Prawns
8.	*Karkadi*	A type prawn
9.	*Tembel*	A type of prawn
10.	*Bangude*	Mackerel
11.	*Bhuthayi*	Sardines
12.	*Muru meenu*	Rock cod
13.	*Nangu*	Soles
14.	*Ade menu*	False trevally
15.	*Bondas*	Squids
16.	*Pambol*	Ribbonfish
Gears		
17.	Manji bale	Pomfret net
18.	Kantha bale	Set gillnet
19.	Patta bale	Encircling gillnet

Discussion Group 1

Discussion Group 2

Discussion Group 3

Discussion Group 4

Workshop participants interacting with the fisher folks and auctioneer during field exercise at Meenakaliya Village near Baikampady

Workshop participants interviewing fisherman during field exercise at Meenakaliya Village near Baikampady

Workshop participants interviewing fishermen during field exercise at Meenakaliya Village near Baikampady

Group discussion involving community members after the field exercise at Meenakaliya Village near Baikampady


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