Portraying a Vulnerable Fishing Village – A Case Study of Elamkunnappuzha Fishing Village, Kerala

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Abstract
Indian fisheries sector is vibrant enough to provide dependency for over 14.5 million people across the country for their livelihood, with an annual marine fish production of 3.83 million tonnes in 2017. Kerala stood third in the fish producing states of the country with a contribution of 3.85 lakh tones. Nevertheless of adorning the highest literacy rate in the country, the state of Kerala is having the marginalization hiccup in the case of fishermen community. The fishermen of Kerala are marginalized far way behind with comparatively lower level of literacy rate and educational attainment which limits them with minimal alternative livelihood options. Along with these, climatic changes also affect the sector a lot and make the fisherman’s life more vulnerable. This study examines the effect of climate change over the fishermen families of the Elamkunnappuzha fishing village in Ernakulam district, Kerala. The district possesses around 10% of the fishing villages and 8% of the fishermen families of the state. Elamkunnappuzha village is one of the major fishing villages from the South West hotspot regions of India. Even though the village is having a century old fishery culture and a strong emotional attachment to the fishing job, people are not ready to direct their young generation into this sector which indicates the higher level of vulnerability prevailing in the sector. As the first of its kind conducted at one of the most vulnerable marine hotspots of Kerala and which explains the problems, prospects of the inhabitants in the sector, the study has its own relevance as a basis to develop proper adaptation mitigation strategies for the fisher folks.

Keywords: Fisheries, Socioeconomics, Fisherfolks, Vulnerability, Fishing village, Community development, Kerala fisheries, Fishermen community

I. INTRODUCTION

Millions of people around the globe including many in developing countries like India are depending upon fisheries for their livelihood. Indian fisheries sector is vibrant enough to provide dependency for over 14.5 million people across the country for their livelihood, with an annual marine fish production of 3.83 million tonnes in 2017. There are 3,288 marine fishing villages in nine maritime states and two union territories of India, sheltering around four million marine fisherfolk populations comprising in 864,550 families. Among the 3,288 marine fishing villages of the country, seven per cent is in Kerala abiding 14 per cent of the total marine fishermen households and 15.3 per cent of the total marine fisherfolk population of the country (CMFRI Marine Fisheries Census, 2010). Still, the twin problems of unemployment and mal-nourishment in rural India can be simultaneously addressed for an efficient utilization of the available resources through involvement of local people (Datta and Kundu, 2007).

Even though the state of Kerala is rated among the top three maritime states of the country, still there are illiterate/semiliterate and indigent fishermen who lack the knowledge of latest fishery technologies and proper attitude towards fishery development (Chakrabarthy et al., 2005). Proper management policy involves appropriate choice of inputs that can have a major impact on employment in fishery which in turn influences the economy of the concerned locality (Heady, 2000). Nevertheless of adorning the highest literacy rate in the country, the state of Kerala is having the marginalization hiccup in the case of fishermen community. The fishermen of Kerala are marginalized far way behind with comparatively lower level of literacy rate and educational attainment which limits them with minimal alternative livelihood options. Shyam et al. (2014) reported low level of awareness on climate change among fisher folk of Kerala owing to the fact that climate change issues are entangled with other developmental issues; thereby community could not decipher climate change issues in particular. According to the reports of Ridgway (2007a); Cai et al. (2005); Cai (2006); the impacts of climate change is expected to be observed in the southern part of India.
According to the study conducted by Shyam et al. (2014), the districts of Thiruvananthapuram and Ernakulam are having the highest vulnerable villages in Kerala based on the vulnerability index table formulated using the Patnaik and Narayin method. The district of Ernakulam has a total number of 21 fishing villages casting around 10 per cent of the state total of 222 marine fishing villages, inhabited by around 1,52,159 fisher folk population with a nine percent of it (1,3092) being active marine fishermen (CMFRI Marine Fisheries Census, 2010; PANFISH book, 2011). The current study is an attempt to scrutinize the socioeconomic profile of the fishing community in the Elamkunnapuzha fishing village of Ernakulam district, Kerala. According to Shyam et al (2016), Elamkunnapuzha is one of the most vulnerable coastal village with a high value of vulnerability index and lesser adaptive capacity. The village is inhabited by around four per cent of the total fishermen families (390), fisher folk population (1739) as well as the active fishermen (377) of the district (CMFRI Marine Fisheries Census, 2010). Hence, the study draws attention as the first of its kind done at one of the marine hotspots of the country with a high exposure to climate related shocks and stress. The study provides a basis for the development of adaptation mitigation strategies for the fisher folks.

II. MATERIALS AND METHODS

Location: Ernakulam, the commercial capital of Kerala, has a total number of 21 fishing villages casting around 10 per cent of the state total of 222 marine fishing villages. Around eight per cent of the total fishermen families of the state are residing in Ernakulam district. The Elamkunnapuzha village is one of the major fishing villages from the south west hotspot regions of India situated in the Vypin taluk, between 10° 00' N and 76° 15 E, of the Ernakulam district, where fisheries plays a predominant role as a major source of livelihood for a vast majority of people.

Data collection: In order to crowd a lawful and dependable data, the course of action mainly aimed qualitative information. A pre-tested interview schedule was used for the collection of information directly from the fishermen families through personal discussions and interviews regarding the various aspects of the socioeconomic conditions. The data was collected in 2014 from a total sample of 300 respondents selected from the five coastal wards of the village through random sampling method. Information about their fishing activity, basic household data, economic as well as historic and cultural dependence on fishing, gender equity, employment and occupational structure, income distribution and assets, physical capital, financial capital, social capital, exposure, etc were collected and analyzed. Accordingly, secondary data from CMFRI, fisheries department, census statistics, various research studies, etc were also considered for the study.

The social status of the fisher folks of Elamkunnapuzha village is presented in table 1.

**Table 1: Social status of the fishermen of Elamkunnapuzha village**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fisher folk population</td>
<td>867 (49.8)</td>
<td>872 (50.1)</td>
</tr>
<tr>
<td>Gender wise population(adults)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total fishermen families</td>
<td>390</td>
<td></td>
</tr>
<tr>
<td>Total traditional fishermen families</td>
<td>378</td>
<td></td>
</tr>
<tr>
<td>Total BPL families</td>
<td>185 (47)</td>
<td></td>
</tr>
<tr>
<td>Literates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>272 (31)</td>
<td>260 (30)</td>
</tr>
<tr>
<td>Hr. Secondary</td>
<td>287 (33)</td>
<td>281 (32)</td>
</tr>
<tr>
<td>Above Hr. Sec.</td>
<td>69 (7.9)</td>
<td>50 (5.8)</td>
</tr>
<tr>
<td>Number of active fishermen</td>
<td>377 (21.8)</td>
<td></td>
</tr>
<tr>
<td>Crafts owned by fisher folks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanized</td>
<td>31 (38)</td>
<td></td>
</tr>
<tr>
<td>Outboard</td>
<td>58 (18)</td>
<td></td>
</tr>
<tr>
<td>Non-motorized</td>
<td>194 (19)</td>
<td></td>
</tr>
</tbody>
</table>


III. RESULTS AND DISCUSSION

Among the 300 respondents selected randomly from the area 82 per cent (247 nos) are males as the data collection was targeted mainly from the head of the households of the fishing community who can give better and accurate information. Moreover, the particulars about the fishing activity, economic dependence etc can only be clearly reported by the male member of the family. Moreover, the study found out gender equity prevailing in the community and about 98 per cent of the respondents opined that there are women in leadership roles in the community.
A. Fishing activity

According to the study, around 95 per cent of the respondents of the Elamkunnapuzha village reported fishing as their main occupation. More particulars regarding the intensity of fishing activity is detailed in Table 2, which shows the number of days in a week the fisherman engages in fishing.

**Table 2: Fishing Intensity**

<table>
<thead>
<tr>
<th>Fishing intensity</th>
<th>No. of fishers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>207 (69.0)</td>
</tr>
<tr>
<td>3 to 5 days</td>
<td>66 (22.0)</td>
</tr>
<tr>
<td>2 to 3 days</td>
<td>16 (5.3)</td>
</tr>
<tr>
<td>1 to 2 days</td>
<td>5 (1.7)</td>
</tr>
<tr>
<td>Weekly</td>
<td>6 (2.0)</td>
</tr>
</tbody>
</table>

Figures in parentheses indicates percentage to total

Majority of the respondents (69 per cent) are found to be going for fishing activity daily where as an infinitesimal small per cent of the fishers are occupied with fishing activity once in a week. The average length of the fishing trips analyzed shows that lion’s share of the fishermen (77 per cent) are dealing with fishing trips of duration 3 to 6 hours whereas around 15 per cent of the respondents are performing single day fishing activity. Only a one per cent of less than that of the respondents is dealing with fishing trips extending more than a day. More details regarding the average length of fishing trips are furnished in Table 2.

**Table 3: Average length of a fishing trip**

Figures in parentheses indicates percentage to total

The study indicates that there are commendable changes happening in the catches of the fishermen. Major details furnished in table 4 implies that only a three per cent of the respondents attained a catch higher than one ton this year where as almost seven per cent of them had achieved a better catch before. Around 91 per cent of the respondents opined that the availability of most important species targeted by them for commercial purposes had changed beyond belief. Also, it is reported that the average distance travelled by the fishermen for fishing from the coast has increased much according to 93 per cent of the respondents.

**Table 4: Details of the best catch**

Figures in parentheses indicates percentage to total

<table>
<thead>
<tr>
<th>Weight (in tons)</th>
<th>Best catch ever</th>
<th>Best catch this year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than one</td>
<td>104 (35.0)</td>
<td>93 (31)</td>
</tr>
<tr>
<td>1 to 5</td>
<td>20 (6.7)</td>
<td>7 (2.3)</td>
</tr>
<tr>
<td>5 to 10</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>10 to 15</td>
<td>3 (1.0)</td>
<td>2 (0.7)</td>
</tr>
</tbody>
</table>

B. Basic household details

Fishermen livelihood can be demarcated as something literally under the mercy of the seasons as there is much variation found in the household income during the pre-monsoon/monsoon/post-monsoon periods. Almost all of the respondents (97 per cent) were of the same opinion that there is deviation in their household income between the summer and winter periods.

C. Fishing business

The study revealed that majority of the respondents (74 per cent) is doing the fishing business on partnership basis. It was tough to collect the household income details as most of the respondents were not ready to reveal their monthly turn over and also it is difficult to assess as it fluctuates accordingly. Although, the study indicates that more than half of the respondents (63 per cent) are earning an approximate monthly income below Rs 5,000 where as 26 per cent of them are earning between Rs 5,000 and Rs 10,000, 11 per cent are earning between Rs 10,000 and Rs 15,000, monthly.
An evaluation of the income difference collated with the statistical dispersion of the inequality in distribution is done by making use of Lorenz Curve and Gini Coefficients. The Lorenz curve is depicted in figure 1, which clearly shows the extent to which the curve sags below the line of equal distribution.

Fig 1. Lorenz Curve on the income distribution of the fisher households.

Here the deviation of Lorenz curve from the line of equality indicates the considerable amount of income inequality in the society. This Lorenz curve result can be further corroborated with the Gini coefficient which is estimated to be 0.33. Since the value one for Gini coefficient represents perfect inequality of income and the value zero represents perfect equality of income, the figured out value 0.33 in the study implies a noticeable level of income inequality in the fishermen community.

More than half of the respondents (55 per cent) are found depending on their fellow workers for day to day resources to go fishing, whereas the entire respondents are interested in interacting with other fishers rather than marine reserve managers, scientists, safety authorities, etc, when going fishing. This indicates the flaw from the part of the authorities and marine reserve managers in winning the trust of the fisher folks.

D. Economic dependence on fishing

The particulars regarding the food consumption as well as the economic dependence on fishing and other resources has been analysed which indicates that around 41 per cent of the respondents are consuming fresh marine food as well as fresh vegetable products daily and about 61 per cent are eating fish from their own catch. Around 81 per cent of the respondents opined that the most important food source for their households is met through a portion of their fish catch. An infinitesimally small per cent of the respondents are found having a plantation or kitchen garden (15 per cent) as well as livestock (13 per cent) at home. A greater number of them (81 per cent) are buying the vegetable products in the local shop.

The investigation about the economic dependence of the fisherfolks on fishing revealed much important information as furnished in figure 2.

Fig 2: Economic dependence on fishing.

E. Historical and Cultural dependence on fishing

The statistics in regard with the historical as well as the cultural involvement collected from the fisher folks reveal some relevant facts about the fishing community in the study area. In the vicinity 71 per cent of the respondents believe that the fishery in the study area is having a tradition of 100 years and 81 per cent opined that their ancestors were fishers. About 64 per cent of the respondents proudly describe their family as having a fishing identity or culture. The respondents were found having an average experience of 34 years as fishers, ranging from five years to 64 years.
The education details of the ancestors of the respondents shows that around 50 per cent of the respondents are having parents with at least primary education. About 68 per cent of the parents had their own house and around 29 per cent had their own boat.

Information collected regarding the cultural importance of fishing as well as the local ecological knowledge of the fishermen is furnished in figure 3. The fishermen is found knowing much about the environment in which they fish and are of the opinion that the local knowledge about fishing is slightly included in local natural resource management plans. Meanwhile, they dint think it is important to pass on local knowledge about fishing to younger generations as well as are not at all concerned about the lack of young people entering the fishing industry in the area. This pinpoints the bad impression the community is having regarding the future of fishing business.

**F. Institutional flexibility**

An analysis over the institutional flexibility was helpful to throw light over the adaptive capacity of the fisher folks in the study area. It was found that there are three major markets in the area where fish and vegetables can be bought, according to majority of the respondents (62 per cent). A greater number of fishermen (89 per cent) are selling their fish through intermediary or middlemen in the major markets of the area. It was also found that the fish price has not been relatively stable in the past three years. The entire respondents supported the same and also believe that it is the power of the middleman that dictates the price of the fish in the local markets.

More details regarding the fishing compliance and conflict as well as access to institutional safety nets & information are equipped in figure 4 which indicates the seriousness of illegal fishing prevailing in the area. The absence of proper linkage of the community with government departments and/or academic institutions is affecting the availability of up-to-date information about fishing.

**G. Resource management institutions**

While analyzing the adaptive capacity of the fisher folks it is relevant to gather information about the resource management institutions, and accordingly 83 per cent of the respondents confirmed the presence of marine resource management institutions of traditional
management; managed by chiefs/custom, in their locality. About 81 per cent of the respondents reported that there is change in the rules and practices in response to environmental changes.

**H. Social dependence**

Analyses involved the details regarding the attachment of the fisherfolks to their own place, which showed that around 76 per cent of the respondents strongly believe that they belong to their community and place. The survey found a strong emotional attachment of the fisherfolks to their own place and along with that more than half of them (78 per cent) consider friendships and relationships as very important in their place. Around 69 per cent of the respondents opined that they fish for pleasure rather than a living, and 60 per cent of them believe that they can think of few other jobs than fishing. More than half of the respondents (55 per cent) are of the opinion that fishing is a lifestyle than a job for them. The viewpoint of the majority (70 per cent) is that being independent is the best thing about being a fisher and are very proud to introduce themselves as fishers. Still, the irony exists that 79 per cent of them are not interested to divert their children into the fishing profession. This is an important fact which pinpoints the vulnerable situation faced by the fisherfolks. The scarcity of resource and the uncertainty of the job are the major reasons which make the fishermen to turn away their coming generations into some other fields.

**I. Occupational flexibility**

In order to assess the capacity of the respondents to anticipate changes and to develop response strategies, particulars in regard with the occupational flexibility were collected and analysed. The stats represented in figure 5 shows that a better part of the respondents (84 per cent) surmised fishing as a very important economic activity in the community. Along with that, the information regarding the occupational mobility presented in the figure reveals that 54 per cent of the respondents got employed sometimes in more than one job per year. About 37 per cent of the respondents are not at all ready to move to a bigger town or community for work if necessary.

**J. Human capital**

In order to assess the social capital of the community details regarding the gender equity, health, education, skills, and knowledge were collected and analyzed.

*a). Health:* The particulars regarding health status collected indicates that 93 per cent of the respondents are not having anyone in their house who are infirm or needed assistance to undertake daily chores for the past 12 months. Also, around 94 per cent of them are not having anyone in their family chronically ill to do even normal activities.

*b). Education, Skills and Knowledge:* Around 72 per cent of the respondents are having only primary level school education whereas 24 per cent are having high school education. All of the respondents reported that they are having basic skills in at least any of the other fields like gardening/horticulture, welding, mechanics, electronics, etc. Also, the basic knowledge of the fishers in various areas were enumerated and presented in figure 6.
Fig 6: Basic knowledge in various areas.

K. Financial capital

Even though majority of the respondents (78 per cent) are not having any savings or money put aside for emergencies, almost all of them (98 per cent) are of the opinion that they are able to gather money in case of emergency. About 42 per cent of the respondents are found owing money to someone whereas around 98 per cent of them hadn’t loaned money to anyone in the last year. While 43 per cent of the respondents are seeking financial help from their friends and family, a same number of people are preferring banks. Almost half of the respondents (48 per cent) are having mortgage on their house for an average amount of Rs 3.4 lakhs ranging from Rs 30,000 to Rs 15 lakhs. It was found that around 41 per cent of the respondents are having life insurance and nearly ten per cent is having their house and boat insured.

L. Physical capital

The analysis of physical capital involved the assessment of the various asset particulars and living conditions including household assets, freshwater supply, energy source, waste management, etc. of the fishers.

According to the study, almost all of the respondents (98 per cent) are living in their own houses, which are of an average of 20 years old ranging from six months to 75 years and about 48 per cent of them are of the opinion that their house need much renovation and maintenance. Around 12 per cent of the respondents are possessing outboard motorboats, eight per cent are having their own dugout canoes, four per cent are owning fibre canoes, whereas 75 per cent of the respondents doesn’t own a boat.

Fig 7: Household assets

The statistics of the household assets also includes various other particulars like whether the respondent have vehicle, fishing gear, television, gas or electric stove, cell phones, piped water, refrigerator, radio/cassette player, video/DVD player, generator, electricity, washing machine, kerosene lamps, electric lamps, solar panel, and garden/power tools as depicted in figure7.

Only 21 per cent of the respondents have water tanks and a majority of the people (44 per cent) is depending on public system as the main source of drinking water. About 21 per cent of the respondents are having their own well/bore hole. The entire respondents are having their mains connected as the main source of energy. Around 53 per cent of the respondents are using firewood as the cooking fuel, while 46 per cent is using cooking gas. All of the respondents are having their own toilets and around 52 per cent are doing nothing to manage the waste water. Around 68 per cent of the
respondents are following open burning method to get rid of the rubbish.

**M. Exposure**

The particulars amassed to assess the exposure of the fishers include personal exposure to storms, floods, cyclones, droughts, and shoreline changes occurred in the area. The details shows that about 14 per cent of the respondents living in areas prone to flooding and around 55 per cent feel that their main occupation is somewhat dangerous in the context of climatic exposure. There haven’t been any large storms or cyclones or drought reported in the area according to the respondents.

A four per cent of the respondents experienced flood in their area in the last five years, while around 31 per cent of the respondents get their water source dirty during heavy rains or flooding. About 43 per cent of them are of the opinion that actions has been taken by the households to prevent flood damage. The briefing of the data portrayed in figure 7 can provide a better picture of the shoreline changes happened in the study area which was found to be having serious effects upon the livelihood of the fishermen household.

### IV. CONCLUSION

The study examined the socio economic profile of the fisherfolks in the Elamkunnapuzha fishing village of Ernakulam district, Kerala. By analysing the data collected from the 300 fishermen selected randomly from the village, a clear picture of the socio economics status of the fishers is obtained. Fishing is found out as the major economic activity of the village and the whole population are fishers. Even though the village is having a century old fishery culture, people are not ready to direct their young generation into this field which indicates the vulnerability prevailing in the sector. The fishermen is found knowing much about the environment in which they fish, still they dint think it is important to pass on local knowledge about fishing to younger generations as well as are not at all concerned about the lack of young people entering the fishing industry in the area. Even though the viewpoint of the majority (70 per cent) is that being independent is the best thing about being a fisher and are very proud to introduce themselves as fishers, still the irony exists that 79 per cent of them are not interested to divert their children in to the fishing profession. The study reveals the scarcity of resource and level of uncertainty prevailing in the community. Commendable changes are found happening in the availability of catches which is seriously affecting the livelihood of fishermen, as for around 81 per cent of the respondents the most important food source for their households is met through a portion of their fish catch. About 91 per cent of the respondents opined that
the availability of most important species targeted by them for commercial purposes had changed beyond belief and also, it is reported that the average distance travelled by the fishermen for fishing from the coast has increased much. An evaluation of the income difference collated with the statistical dispersion of the inequality in distribution done by making use of Lorenz Curve and Gini Coefficients revealed that there is income inequality in the area, with a Gini coefficient valued 0.33. half of the respondents are found to be earning less than Rs 5000 per month, which is an average amount only and can’t be taken seriously as the people were not much interested in revealing their income details. Moreover, the community never earns a fixed income monthly. Even though none of the respondents are having any savings, they are confident enough that they can procure money in case of emergencies.

The drastic decrease in the availability of fishes and the increased efforts in fishing activities has affected the livelihood of fishermen much. Similar results were also pointed out in the studies conducted by Shyam et al. (2014) in which a climate change perspective of the vulnerability assessment of the fishermen of Kerala is done. Many changes are visible in the fishing activity over the years in terms of the availability of species, fishing grounds, etc. The personal exposure and environmental changes as part of the current changes in the climatic conditions can be considered as one of the major reasons for the scarcity of resource, uncertainty of the job and other vulnerable conditions affecting the livelihood of the fishermen household in the study area. In regard with the occupational flexibility, all of the respondents are found having basic skills in at least any of the other fields like gardening/horticulture, welding, mechanics, electronics, etc.

Proper awareness campaigns have to be carried out to protect the localities. It is found that much of the respondents are interested in learning new ways to improve their business skills which indicates the ample scope of training campaigns and provision of proper knowledge about the improved fishing and fish culture practices on scientific basis in the locality to uplift the community and thereby the living status of the fishers. Further works has to be done in order to weave suitable policy measures for the fishermen households to cope with and adapt to the changing scenario.

REFERENCES


