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# ASSESSING THE SOCIOECONOMIC PROFILE OF A VULNERABLE COASTAL FISHING VILLAGE IN INDIA

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**Abstract**

Fisheries sector attained immense importance around the globe with augmenting income and employment generation. Indian fisheries sector provide dependency for over 14.5 million people across the country with Gujarat, Tamil Nadu, and Kerala, being the top three marine fish producing states of the country. Even possessing the highest literacy rate in the country, the irony exists that the fishers of Kerala are marginalized far way behind with comparatively higher level of literacy rate and educational attainment which limits them with minimal alternative livelihood options.This study is an attempt to examine the socio-economic profile of the fishing community in the Poonthura fishing village of the Thiruvananthapuram district of Kerala, where fishing is the most important economic activity. Among the 222 fishing villages of Kerala, Thiruvananthapuram has the maximum number of marine fishing villages (19 per cent) where in fishermen reside. Poonthura village is one of the major fishing villages from the South West hotspot regions of India, situated in the suburbs of Thiruvananthapuram district, the capital of Kerala. The study analyzed various socioeconomic aspects such as thefishing activity, basic household data, economic as well as historic and cultural dependence on fishing, gender equity, employment and occupational structure, community infrastructure, income distribution and assets, physical capital, financial capital, social capital, and exposure of the fishermen families by taking 500 samples from the study area. 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. The study as the first of its kind conducted at one of the most vulnerable marine hotspot of Kerala and which explains the problems, prospects of the inhabitants in the sector has its own relevance as a basis to develop proper adaptation mitigation strategies for the fisher folks.

**Keywords: c**limate change, vulnerability, fishermen, fishing village, adaptive capacity, sensitivity, resilience, socioeconomics.

## 1. Introduction

The fisheries sector attained immense importance in most of the developing and developed countries of the world in the point of income and employment generation. 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 3.4 million tonnes in 2015. Even though, the twin problems of unemployment and mal-nourishment in rural India can be simultaneously addressed for an efficient utilisation of the available resources through involvement of local people (Datta and Kundu, 2007).Around 29.2 per cent of the total fish production of the India is yielded from the southwest region of the west coast of the country comprising Kerala, Karnataka and Goa, of which 49 per cent contribution was from Kerala. Of the nine maritime states and two union territories of the country, Kerala stands third in landings, following Gujarat and Tamil Nadu, with a landings of 4.82 lakh tons (14.2 per cent). 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 Annual Report, 2015-16; CMFRI Marine Fisheries Census, 2010).

Even though the state of Kerala is rated among the top three maritime states of the country, stillthere 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).Even possessing the highest literacy rate in the country, the irony exists that the fishers 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. Furthermore 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 by using the Patnaik and Narayin method.The district of Thiruvananthapuram, the capital of Kerala, has the maximum number of marine fishing villages (42 nos) in the state casting around 19 per cent of the state total of 222 marine fishing villages, inhabited by the maximum number of fishermen (28 per cent) and fisherfolk population (24 per cent) of the state (CMFRI Marine Fisheries Census, 2010). The current study is an attempt to examine the socio-economic profile of the fishing community in the Poonthura fishing village of the Thiruvananthapuram district of Kerala, where fishing is the most important economic activity. The study draws attention as it is conducted at one of the marine hotspots in the country which experiences high exposure to climate related shocks and stress along with a higher vulnerability index as the communities are located near the coastline. The location is discovered as the one with the highest vulnerability index and a lesser adaptive capacity according to the study conducted by Shyam *et al*(2016). Hence, a study regarding the socioeconomic profile such a fishing village is worth enough as a basis to develop proper adaptation mitigation strategies for the fisherfolks.

## 2. Materials and methods

Location:Thiruvananthapuram, the capital of Kerala, has the maximum number of fishing villages (42nos)in Kerala constituting around 19 per cent of the state total (CMFRI Marine Fisheries Census, 2010). The study is conducted at the coastal village of Poonthura situated in the suburbs of Thiruvananthapuram, inhabited by around four per cent of the total fishermen families and six per cent of the total fisherfolk population of Thiruvananthapuram (CMFRI Marine Fisheries Census, 2010). Poonthura village is one of the major fishing villages from the south west hotspot regions of India lying between 10° 00' N and 76° 15 E respectively. Similar to many other coastal cities of India, Thiruvananthapuram also experiences a tropical climate.

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 socio-economic conditions. A total sample of 500 respondents was selected from the coastal wards (74 and 76) 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 analysed. 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 Poonthura village is presented in table 1. The religious orientation indicates that the fisher populace of Poonthura comes under Christian community..

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

| | | | |
|---|---|---|---|
| Total fisher folk population | | | 8871 |
| Gender wise population(adults) | | Male | 2707 (31) |
| | | Female | 2569 (29) |
| Total fishermen families | | | 1290 |
| Total traditional fishermen families | | | 1290 |
| Total BPL families | | | 968 (75) |
| Literates | Primary | Male | 1028 (38) |
| | | Female | 978 (38) |
| | Hr. Secondary | Male | 1369 (51) |
| | | Female | 1321 (51) |
| | Above Hr.Sec. | Male | 1097 (41) |
| | | Female | 1103 (43) |
| Number of active fishermen | | | 1584 (59) |
| Crafts owned by fisher folks | Outboard | | 361 (89) |
| | Non-motorized | | 44 (11) |
| Fishing craft in the fishery | Motorized | | 173 (72) |
| | Non-motorized | | 68 (28) |

*Figures in parentheses indicate percentage to total.* Source: Marine Fisheries Census, 2010.

## 3. Results and discussion

Among the 500 respondents selected randomly, 95 per cent (476 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 questions about the fishing activity, economic dependence etc can only be answered by the male member of the family.

### 3.1. Fishing activity

According to the response, about 100 per cent of the respondents of the village are considering fishing as their main occupation, while only one of them deal it as a part time occupation. The results are in tune with that of all the major surveys conducted at Poonthura which indicates that fishing and allied activities are the most important economic activities in the locality.[17]

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

| **Fishing intensity** | **No. of fishers** |
|---|---|
| Daily | 108 (22) |
| 3 to 5 days | 335 (67) |
| 2 to 3 days | 42 (8) |
| 1 to 2 days | 2 (0.4) |
| Weekly | 7 (1.4) |
| Less than once in a week | 5 (1) |

*Figures in parentheses indicates percentage to total*

The study revealed that majority of the respondents (67 per cent) are engaged in fishing activity for about 3 to 5 days in a week where as about 22 per cent of the respondents are busy in fishing activity for the whole week. An infinitesimally small per cent of the fishers

are occupied with fishing activity for less than three days of a week. This shows that even though 100 per cent of the respondents consider fishing as their main occupation, around 10 per cent of them are doing fishing activity for less than three days in a week.

While probing the details about the duration of a fishing trip it is found out that about 64 per cent of the respondents performs single day fishing trips whereas 32 per cent are dealing with trips of duration 3 to 6 hours. This is mainly due to the absence of trawl boats in the study area. More information regarding the average length of fishing trip is detailed in table 3.

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

| **Average length of a fishing trip** | **No of fishers** |
|---|---|
| Less than one hour | 1 (0.2) |
| 1 -3 hours | 13 (3) |
| 3 -6 hours | 160 (32) |
| 1 day | 318 (64) |
| 2 days | 6 (1) |
| 1 week | 2 (0.4) |
| More than 1 week | 0 (0) |

*Figures in parentheses indicates percentage to total*

The procured data presented in table 4 shows that majority of the respondents had got less than one ton as the best catch ever (58 per cent) as well as for this year (68 per cent). About 40 per cent of the respondents had got a best catch of one to five tons ever while 28 per cent of them got the same this year too. Only a three per cent of the respondents attained a highest catch of 5–10 tones, where as a one per cent attained 10-15 tons this year.

**Table 4:** Fish catch details

| Weight (in tons) | Best catch ever | Best catch this year |
|---|---|---|
| Less than one | 222 (58) | 233 (68) |
| 1 to 5 | 154 (40) | 94 (28) |
| 5 to 10 | 10 (3) | 11 (3) |
| 10 to 15 | 0 (0) | 3 (1) |

*Figures in parentheses indicates percentage to total*

The major share of the respondents (74 per cent) opined that the average distance of their fishing ground from the coast has increased, and also 90 per cent of the respondents opined that the availability of the major species targeted by them for commercial purposes has been changed over time. This indicates the widespread changes happening in the fishing activity.

### 3.2. Basic household data

Details regarding the household income were collected for the proper analysis of the basic household income which has revealed some notable results for the study. About 83 per cent of the respondents are of the opinion that there is much variation in their household income during the pre monsoon, monsoon and post monsoon periods. As there is no trawl boats operating in the study area, trawl ban is not having much effect upon the livelihood of the fishers.

#### 3.2.1. Fishing business

Majority of the respondents (86 per cent) are doing the fishing activity on partnership basis or works with big dugout canoes. Only a small per cent (14 per cent) of the respondents own their fishing business. The approximate monthly turnover statistics collected through the survey unveiled the income inequalities or the inequality in distribution prevailing in the fisher society. However it was tough to collect the household income details and about 29 per cent of the respondents were not even ready to reveal their monthly turn over and recall bias. It's true that for a fisherman there is no any fixed monthly turnover as it fluctuates according to the changes in the marine resources.

Although, the data collected indicates that about 90 per cent of the respondents are earning an amount below Rs 10,000 per month, while an infinitesimally small per cent of the respondents (one per cent) are earning in between Rs 40,000 and Rs 50,000, monthly. About six per cent of the respondents are acquiring an amount between Rs 10,000 and Rs 20,000 whereas three per cent are drawing an amount within Rs 20,000 to Rs 30,000, 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.

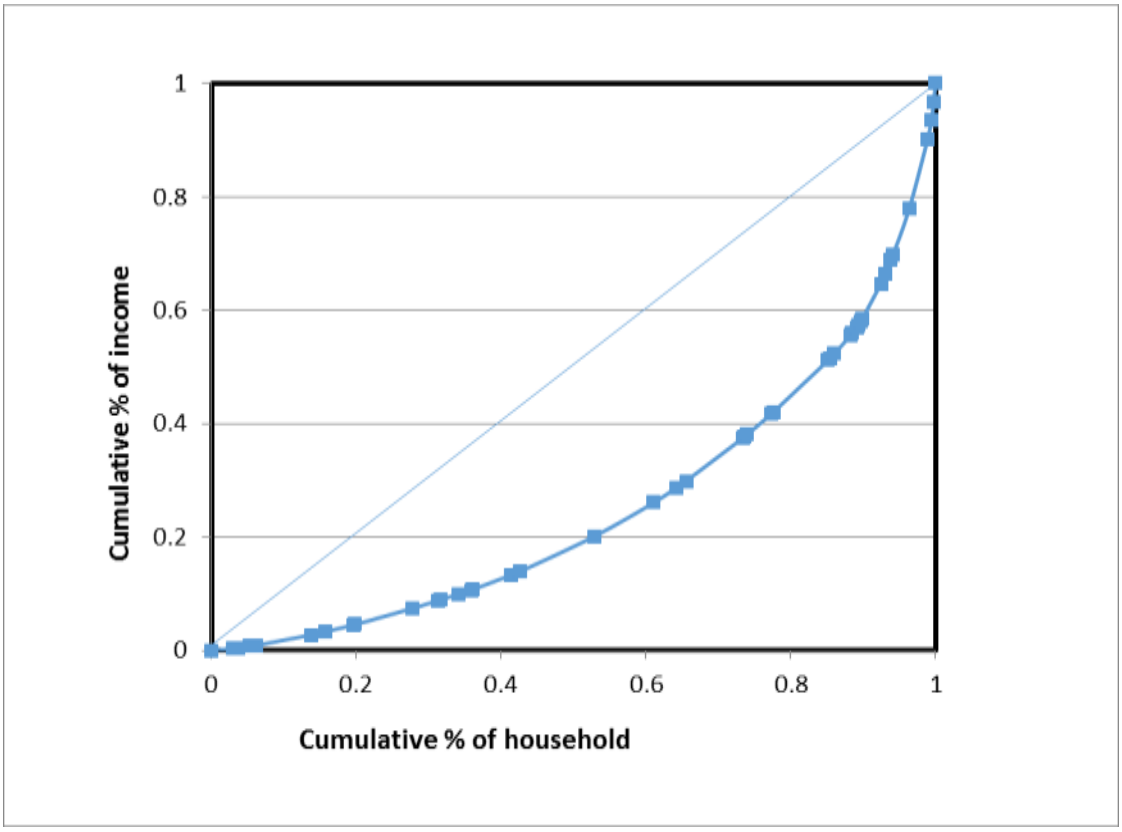



**Fig 1.**Lorenz Curve on the income distribution of the fisher households

Here the Lorenz curve is almost half way behind the line of equality, which indicates a 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 0.495. 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 0.495 in the study implies a noticeable level of income inequality in the fishermen community.

### 3.3. Economic dependence on fishing

#### 3.3.1. Food consumption

The particulars in regard to the food consumption of the fisherfolks were collected and analysed, which affirmed that around 70 per cent of the respondents consume fresh marine food daily, and about 91 per cent of the respondents are eating fish from their own catch. It was found out that only 18 per cent of the respondents are consuming fresh vegetable products daily, where as a majority of about 48 per cent are having it around five days a week. Around 37 per cent of the respondents opined that the most important food source for their households is met through a portion of their fish catch where as 26 per cent are buying food items from the local shop. About 10 per cent of the respondents are having their own garden or plantations and a five per cent of them are having livestock. The data points out the relevance of fishing activity as the most important economic activity in the study area.

### 3.4. Historical and Cultural dependence on fishing

Statistics in regard with the historical as well as the cultural involvement collected from the fisherfolks reveals some relevant facts about the fishing community in the study area. In the vicinity 98 per cent of the respondents believe that the fishery in the study area is having a tradition of 100 years and 89 per cent of them opined that their ancestors were fishers. About 92 per cent of the respondents proudly describe their family as having a fishing identity or culture.

The education details of the ancestors of the respondents were also collected which shows that around 43 per cent of the respondents are having parents with at least primary education. About 55 per cent of the parents had their own house and around 10 per cent had their own boat.

### 3.5. Institutional flexibility

The adaptive capacity of the fisherfolks in the study area is analysed by making use of the various details regarding the flexibility of the respondents. According to the response of the majority (61.2 per cent) there is only a single main market in the community from where the local people can buy fish, where as 53 per cent of them told that there are two markets or auction sites in the locality where they can sell the fish directly. About 78 per cent of the respondents were of the opinion that there is vast change in fish prices over the past three

years and more than half of the respondents (66 per cent) believe that the quantity of fish available on a day dictates the price of fish in the local market. About 40 per cent of the respondents reported that there are two markets in their community where they can buy or sell fresh meat and vegetables.

### 3.5.1. Resource management institutions

While analysing the adaptive capacity of the fisherfolks it is relevant to gather information about the resource management institutions, and accordingly 73 per cent of the respondents stated that there is no any type of marine resource management in the locality whereas 27 per cent of the respondents opined that there is some government controlled management happening in the locality. About 68 per cent of the respondents reported that there is no change in the rules and practices in response to environmental changes. These findings points out the extent of vulnerability of the fisherfolks in regard to their adaptive capacity.

### 3.5.2. Community infrastructure

The study assessed community infrastructure by analysing the presence of various amenities in the locality. The statistics provided by the respondents are depicted in figure 2 which shows the presence of basic necessities and other community infrastructures in the locality.

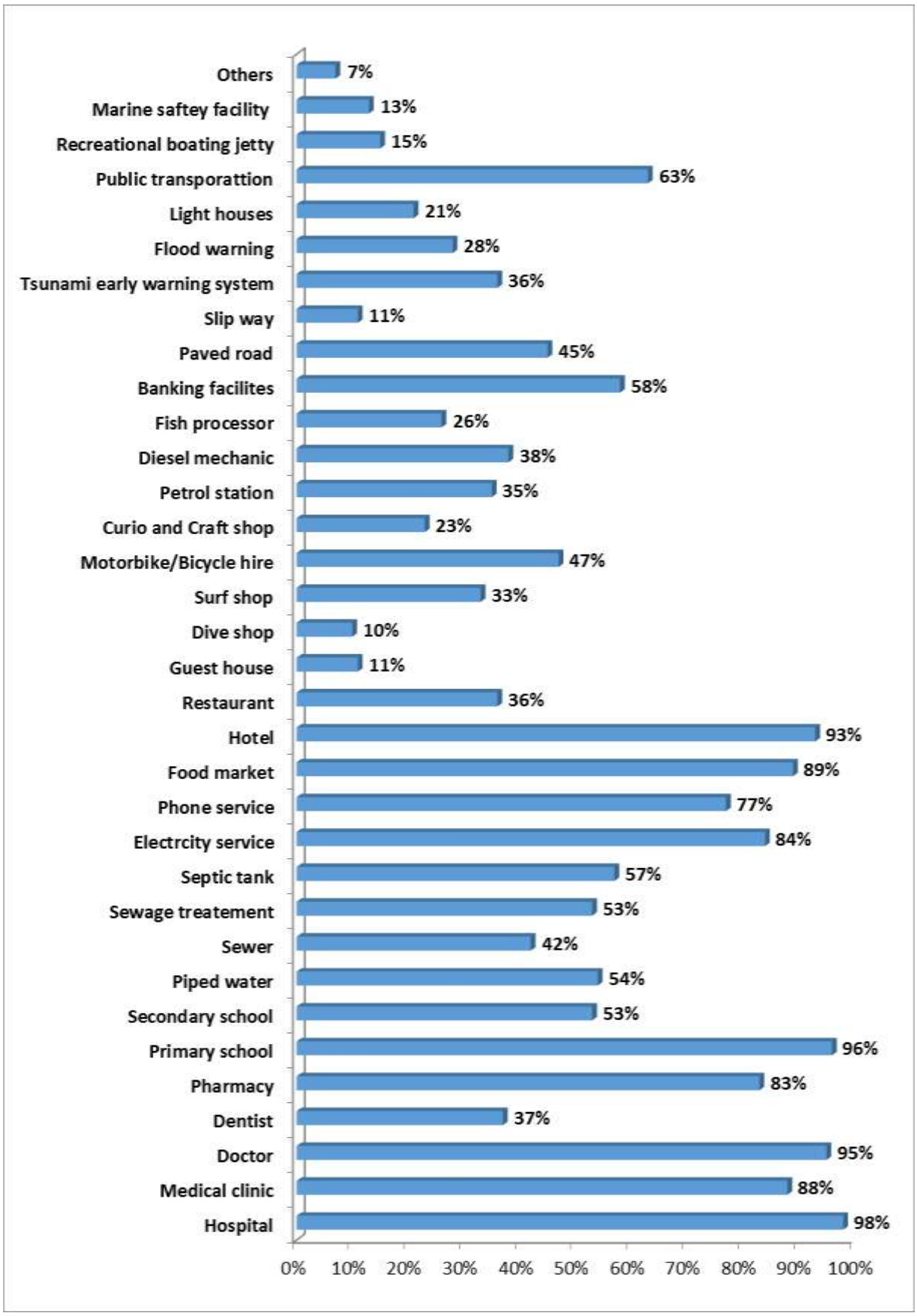
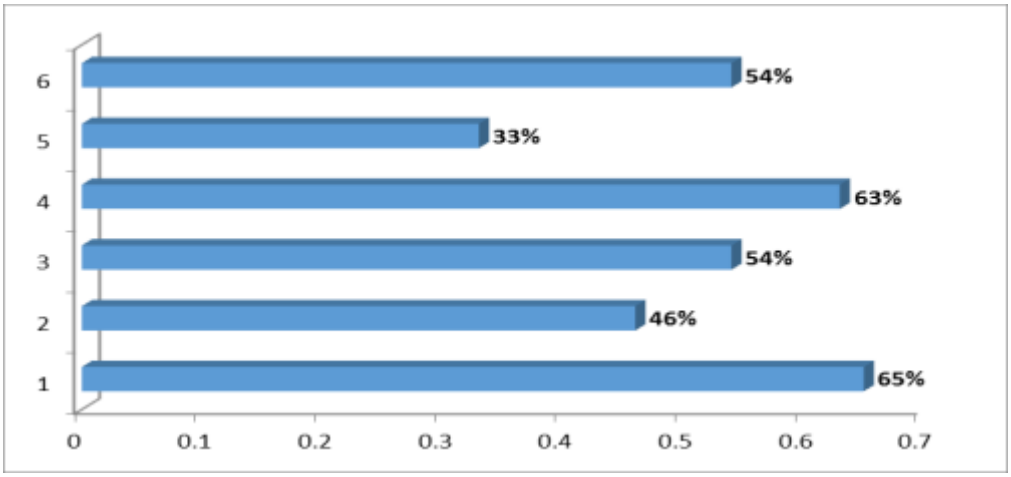



**Fig 2:** Community infrastructure

### 3.6. Social dependence

Analyses involved the details regarding the attachment of the fisherfolks to their own place, which showed that around 86 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 (52 per cent) consider friendships and relationships as very important in their place.

Various details in relation to analyse the attachment of the respondents to the fishing activity were collected and depicted in figure 3. The particulars included mentality of the respondents to the fishing activity. The study revealed that 65 per cent of the respondents consider fishing as an option to earn a living, not for pleasure and 46.4 per cent of the respondents can't even think of another job rather than fishing. More than half of the respondents (54 per cent) believe that being independent is the good thing about being fisher while 38 per cent thinks that it is the best thing. A very high emotional attachment to the fishing activity is found among the respondents as 63 per cent of them reported that they are very proud to introduce themselves as a fisher.




1 – Considers fishing activity as an option to earn a living rather than pleasure.

2 – Can't think of another job rather than fishing.

3 – Being Independent is the good thing for a fisher.

4 – Very proud to introduce as a fisher.

5 – Fishing is a job rather than a lifestyle.

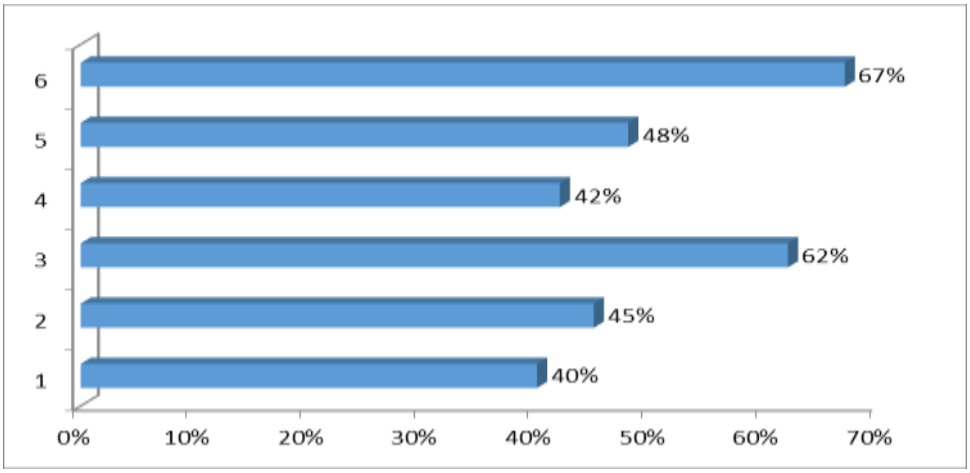
6 – Not interested to divert children in to the fishing profession.

**Fig 3:** Attachment to fishing.

According to the survey, 33 per cent of the respondents are of the opinion that fishing is an important job, while 29 per cent consider it as a lifestyle. Even though there is a high attachment between the fishing activity and the respondents, the lion's share (54 per cent) of them are not ready to divert their children in to the fishing profession. This is an important fact which pin points 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.

### 3.7. Economic dependence

The investigation about the economic dependence of the fisherfolks on fishing revealed much important information. Most of the respondents (40 per cent) are of the opinion that they are not likely to sell their house even if their fishing business fails, whereas around 31 per cent of the respondents were somewhat likely to sell if the situation is that much worse. About 45 per cent of the respondents reported that it is not at all possible to feed their family if they did not go for fishing. The statistics points out the financial instability of the fisherfolks. More details about the economic dependence on fishing are depicted in figure 4.




1 – Not likely to sell house if the fishing business fails.

2 – Not at all possible to feed family in the absence of fishing.

3 – Presence of too many fishers in the fishing industry of the community.

4 – Slightly too many fishers are working in the areas.

5 – Concerned about the level of illegal fishing occurring.

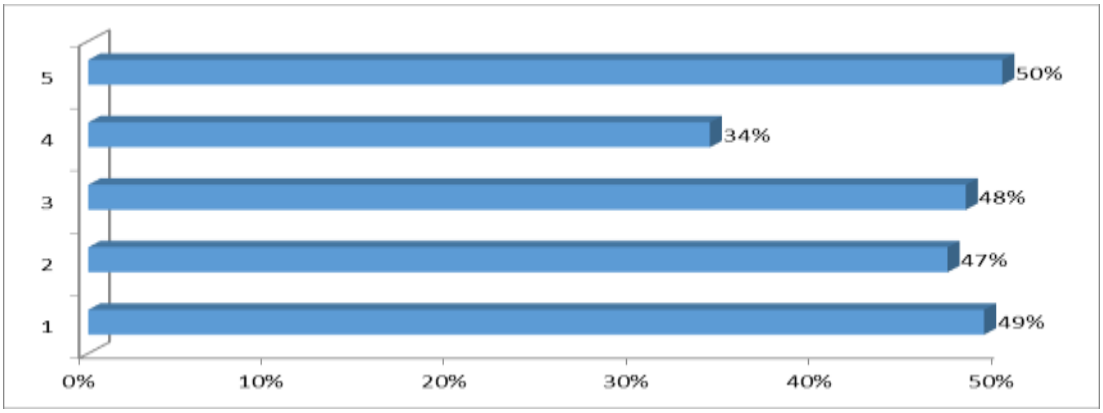
6 – Fish catches are lower by the presence of industrial fishing.

**Fig 4:** Economic dependence on fishing

As part of the analysis of economic dependence, the study tried to scrutinize the level of competition in the field. From figure 4, it can clearly be noticed that the biggest share of the respondents (62 per cent) declared that there are too many fishers in the fishing industry of the community and around 40 per cent of them reported that there are slightly too many fishers working in the areas they fish. Meanwhile, 35 per cent of the respondents opined that there are too many fishers working in the area they fish. In regard to the level of illegal fishing occurring in the area, 48 per cent of the respondents reported their concern about the illegal activities. About 67 per cent of the respondents pointed out the presence of industrial fishing as a reason for lowering the fish catch.

### 3.8. Historical and Cultural dependence

The study tried to throw light upon the historical as well as the cultural dependence of the fishers, by which it is revealed that a better part of the respondents (49 per cent) are including the local knowledge about fishing in local natural resource management plans. Along with that the fishers are concerned about the absence of young people in the field. The statistics presented in figure 5 shows that about 47 per cent of the respondents report their concern about the lack of young people entering the fishing industry in the area.




1 – Includes local knowledge about fishing in local natural resource management plans.

2 – Concerned about the lack of young people entering the fishing industry in the area.

3 – Have quite a lot knowledge about the environment in which they fish.

4 – It's important to pass on local knowledge about fishing to younger generations.

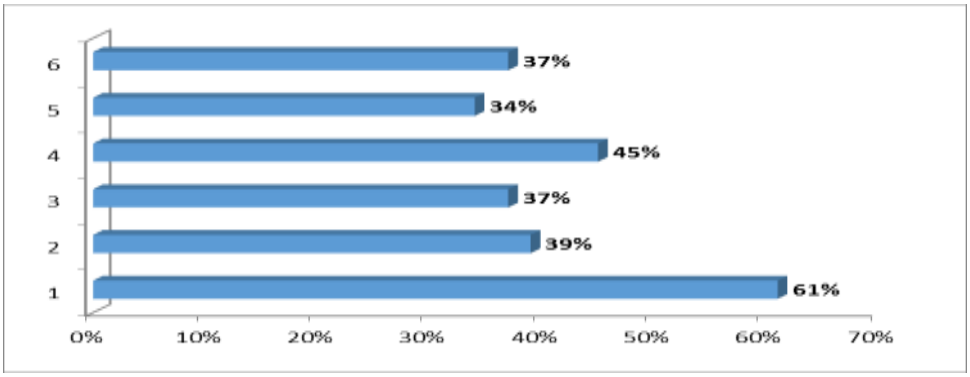
5 – Local knowledge about fishing is maintained in the community.

**Fig 5:** Historical and Cultural dependence

The details collected to assess the local ecological knowledge of the respondents imparts that around 48 per cent of the respondents thinks that they know quite a lot about the environment in which they fish. While 34 per cent of the respondents agree that it is important it pass on local knowledge about fishing to younger generations, around 47 per cent of the remaining ones also seconded the view. Also, half of the respondents are of the opinion that the local knowledge about fishing is being maintained in the community where as 40 per cent of the respondents opined that it is partly lost.

### 3.9. 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 6 shows that a better part of the respondents (61 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 39 per cent of the respondents got employed sometimes in more than one job per year where as 32 per cent never got employed in any other jobs. According to the response, 37 per cent of them are somewhat willing to move to a bigger town or community for work if necessary, while 35 per cent are not at all willing to move.




1 – Fishing is a very important economic activity.

2 – Sometimes employed in more than one job per year.

3 – Willing to move to a bigger town or community for work, if necessary.

4 – Sometimes gets professional advice before making a business decision.

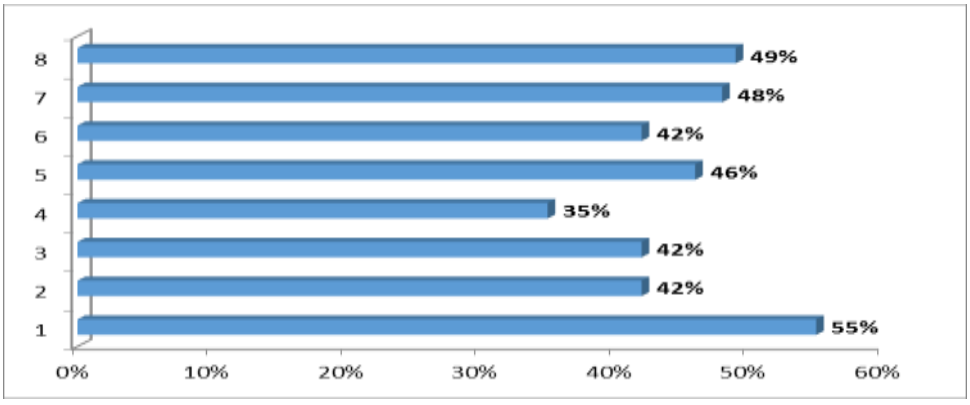
5 – Possible to guess how much money the business will make each month.

**Fig 6:** Occupational flexibility

The stats with respect to the business approach of the fishers while analysed notifies that 45 per cent sometimes get professional advice before making a business decision. About 34 per cent of them reported that it is possible to guess how much money their business will make each month, while 29 per cent denies it. According to them it is impossible to guess the amount of money that the business makes each month. Around 37 per cent of the respondents opined that they are interested in learning new ways to improve their business skills. This is a positive signal about their capacity to anticipate change and to develop response strategies.

**Institutional flexibility**

Analyses were carried out over the particulars regarding fishing compliance and conflict. The information collected from the fishers shows that more than half of them (55 per cent) believes there does not occur any illegal fishing in the community. While around 42 per cent of the respondents reported that only a few people obeys the rules set by the community, 32 per cent reported that no one obeys the rules. More info published in figure 7 explains that 42 per cent of the respondents are of the opinion that only a few people know the individuals who break the fishing rule. Also, 35 per cent opined that the fishing rules that applied in the area are not well enforced. About 46 per cent of the respondents reported that the conflicts between fishers are common in the study area while 35 per cent are of the opinion that it is not very common.



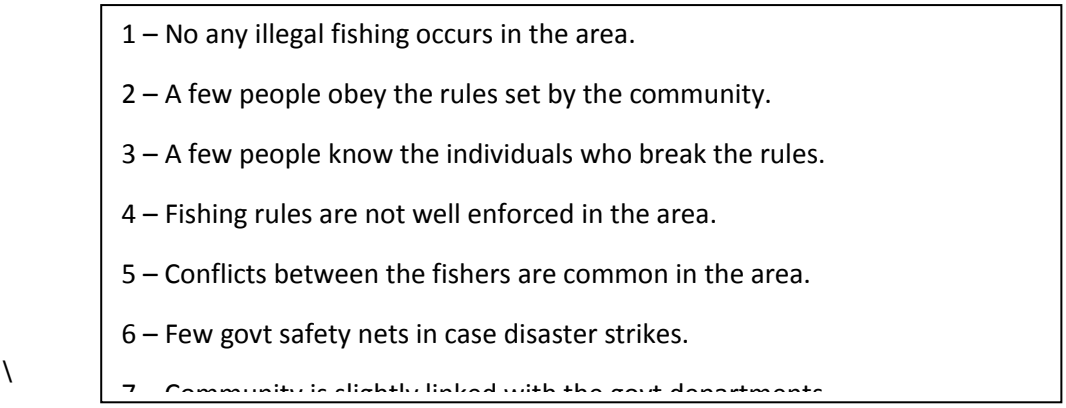



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**Fig 7:** Institutional flexibility

According to the response about the access to institutional safety nets and information, only a few safety nets are provided by the government in case disaster strikes fishing activities in the community. About 42 per cent of the respondents are of the same opinion while 48 per cent opined that the community is only slightly linked with the government departments. The link between the community and the government departments or academic institutions is very important to receive up-to-date information about fishing. About half of the respondents (49 per cent) reported that there is little help from the part of the government to overcome the challenges faced by the community in relation to marine resources.

**Social capital**

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

### 3.9.1. Gender :

In order to assess the human capital, particulars about the gender equity were collected according to which three quarters of the respondents declared that there are women in many leadership roles in their community. Even though there exists some sort of gender discrimination in the fishing business, the fisher women are found more empowered when compared to other sectors of the economy. The study found out that fisher women are empowered politically also, which indicates the better status of them. Similar results were pointed in the study conducted by Shyam *et al.* (2013) regarding the empowerment of fisher women of Kerala.

### 3.9.2. Health:

The particulars regarding health status collected indicates that 81 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 81 per cent of them are not having anyone in their family chronically ill to do even normal activities.

### 3.9.3. Education, Skills and Knowledge:

The info regarding the education level collected shows that around 87 per cent of the respondents are having primary 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 8.

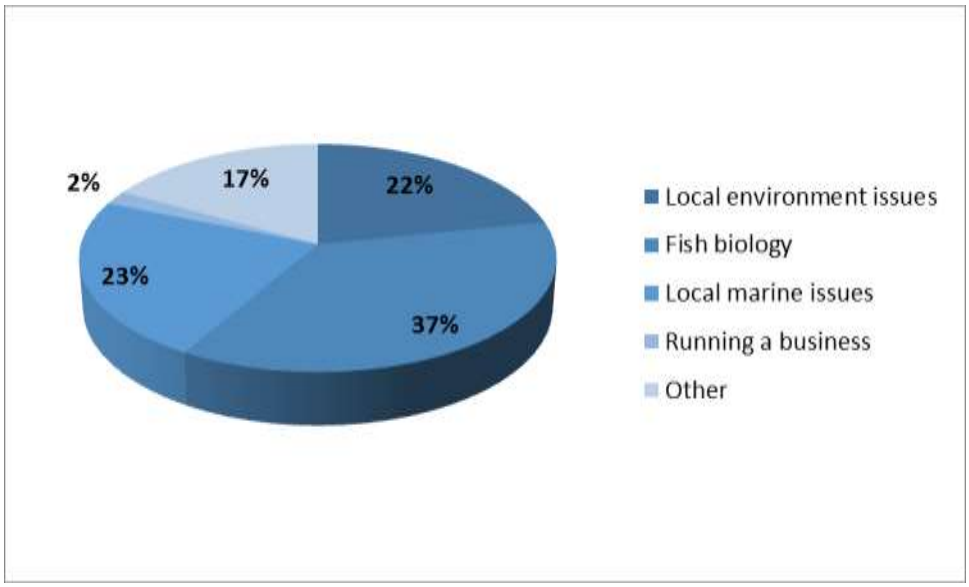


**Fig 8:** Basic knowledge in various areas

Around 37 per cent of the respondents are having basic knowledge in fish biology while 23 per cent and 22 per cent are having knowledge in local marine issues and local environment issues respectively. An infinitesimally small amount of the respondents (2 per cent) are having basic knowledge in running a business.

### 3.10. Financial capital

As the information about the financial capital of the fishers are difficult to obtain, the particulars sourced are amassed are analysed. Major details about savings, debt, credit, insurance, etc are compiled in the study. Through this, it is revealed that for about 65 per cent of the respondents it is difficult to gather cash in case of an emergency. 89 per cent of the respondents reported that they are not having any savings or money put aside for emergencies. This is in tune with the findings of the study conducted by Shyam *et al*. (2013). About 80 per cent of the respondents are having mortgage on their house and around 83 per cent of them owe money to someone.

The credit details of the fishers are represented in figure 9, from which it is clear that major share (63 per cent) of the respondents are normally borrowing money from friends and family, whereas a 24 per cent of the respondents are depending upon small money lenders. Only a seven per cent of the respondents are depending upon banks and a six per cent are seeking other sources.

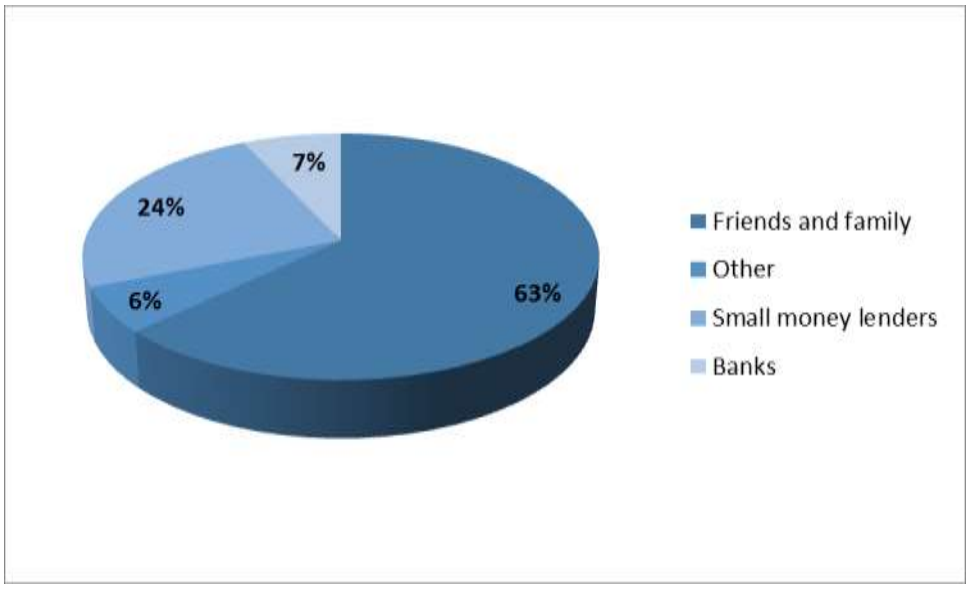


**Fig 9:** Credit details

The particulars show that around 73 per cent of the respondents haven't loaned money to anyone in the last year. The info regarding the insurance policies hold by the respondents were also collected and depicted in figure 10, which shows that more than half of the

respondents are not having any type of insurances. Around 14 per cent of the respondents are having life insurance while 25 per cent are having other type of insurances.

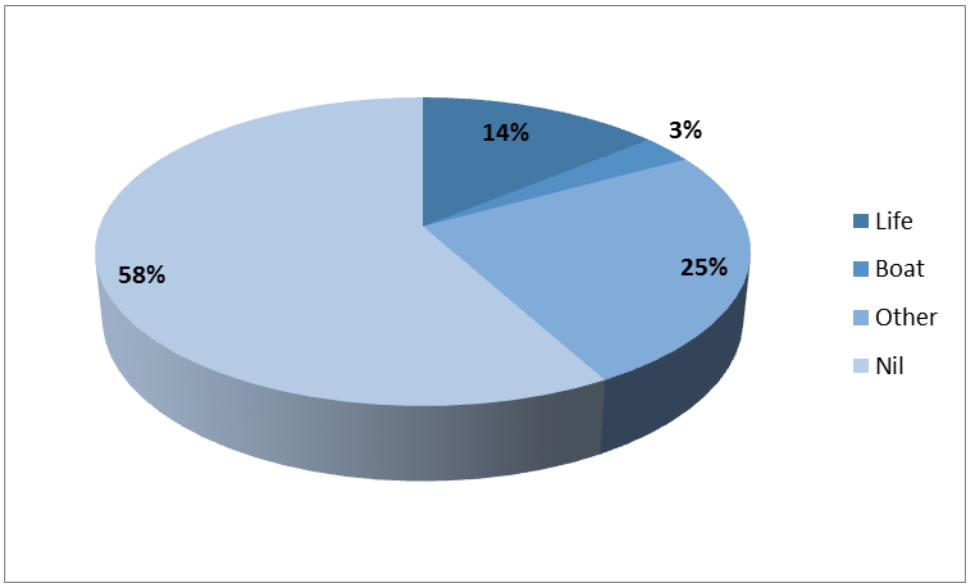


**Fig 10:** Insurance details

### 3.11. 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.

#### 3.11.1. Household assets:

The study assessed the info about the household assets of the fishers which indicated that around 75 per cent respondents own the house they live in and 80 per cent of them opined that their house need much renovation and maintenance. The details gathered shows that about 62 per cent of the respondents have their houses made of concrete bricks, while the remaining are having thatched houses with plywood or wooden walls. The study shows that around 91 per cent of the respondents are not having an own boat, while seven per cent owns a fibre canoe.

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 figure 11.

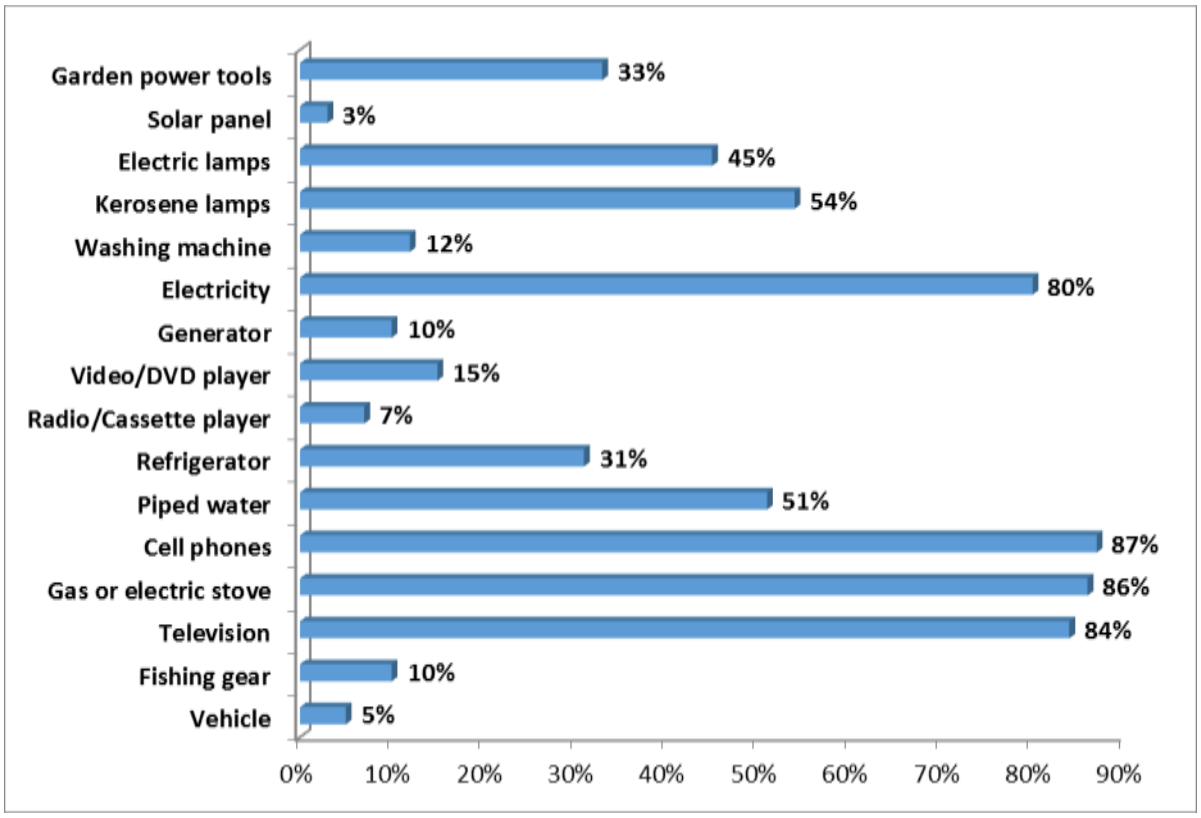


**Fig 11:** Household assets

The study reveals that only a five per cent of the respondents are having own vehicle, while 10 per cent have their own fishing gear. Majority of the respondents possess much of the amenities like television (84 per cent), gas or electric stove (86 per cent), cell phones (87 per cent), electricity(80 per cent), piped water (51 per cent), and kerosene lamps (54 per cent).About 31 per cent of them maintains refrigerator, seven per cent have radio/cassette player, 15 per cent have video/DVD player, 10 per cent have generator, 12 per cent possess washing machine, and 45 per cent have electric lamps, three per cent holds solar panel, and a 33 per cent possess garden/power tools.

The study also analysed the current condition of the building and roof of the houses. According to the respondents, 53 per cent of the houses are having a fair roof and 54 per cent are having a fair building too. It is reported that only a 15 per cent and 14 per cent are having bad roof and building respectively. Around 28 per cent and 29 per cent are having good roof and building respectively.

### 3.11.2. Fresh water supply:

In the case of freshwater supply, around 69 per cent of the respondents are not having a water tank and are depending on various sources for drinking water. The major sources reported by the respondents are depicted in figure 12. According to the response, lion's share (68 per cent) of the fishers is depending upon the public water supply system for drinking water.

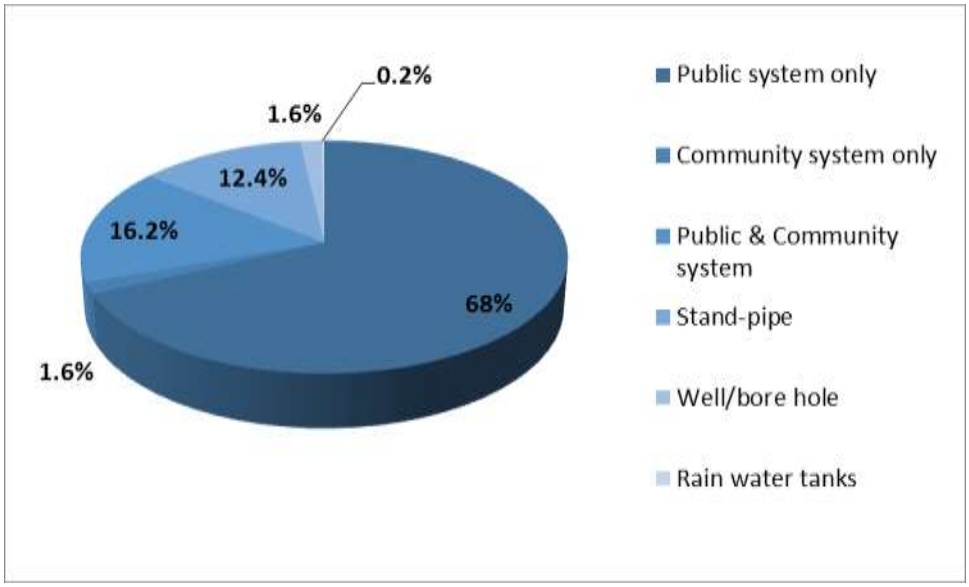


**Fig 12:** Main source of drinking water

Around 16 per cent of the respondents are depending on both the public and community system, while 12 per cent of them are relying on stand pipes. A very small fraction (1.6 per cent) is depending upon wells or bore holes as well as the community system, where as 0.2 per cent are using rain water tanks. The absence of water tanks can be pointed out as a defect of the community

### 3.11.3. Energy:

Among the respondents, around 87 per cent are having their connected with public system as the source of energy whereas 13 per cent are using their own generators. It is found out that around 51 per cent are using cooking gas as a source of water heating while 34 per cent are using firewood. About 11 per cent of the respondents don't have a source for water heating while a small fraction (1.8 per cent) depends on solar as well as electric energy for water heating.

About 80 per cent of the respondents are using cooking gas as the main source of fuel for cooking, while 17 per cent are using firewood for cooking purposes. A very small amount of (one per cent) the respondents are using electric appliances for cooking.

### 3.11.4. Waste:

In the case of waste management info, it is found out that 12 per cent of the respondents are not having their own toilet. Among the remaining 88 per cent, 72 per cent are using pour flush type toilets, while 11 per cent possess flush type toilets. Around eight per cent are having long drop type toilets while five per cent are having composting type toilets.

Details regarding the waste water management show that 53 per cent of the respondents are disposing the waste water to open places or nearby water bodies while 34 per cent are having septic tanks. Around 42 per cent of the respondents are dumping their rubbish while 19 per cent are burning them in the open places.

## 3.12. 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 analyses can be explained under the following heads.

### 3.12.1. Storms:

The statistics about the impact of storm in the study area according to the response of the fishers is summarised in figure 13. From the figure, it can clearly be noted that around 41 per cent of the respondents reported that there has been a cyclone/large storm in the area during the last five years and around 93 per cent of them opined that they has been directly impacted by it.

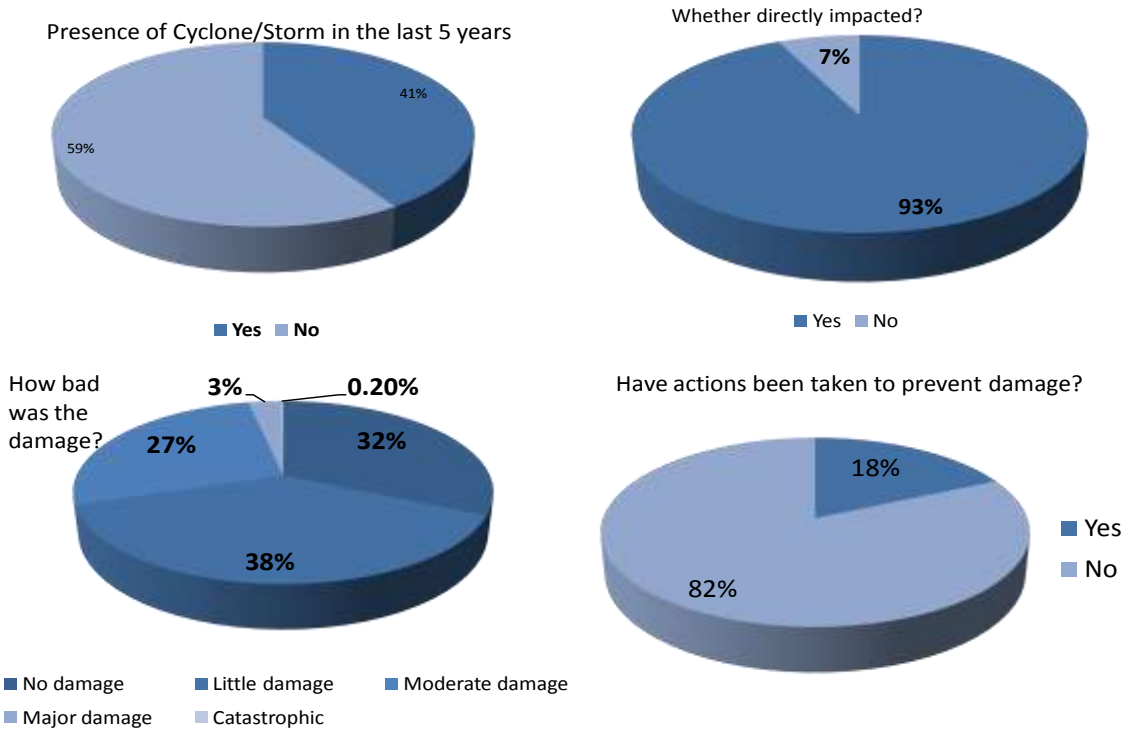


**Fig 13:** Effects of Storm

Details regarding the effect of storm were also collected, which tells that about 27 per cent were moderately affected by the storm while 38 per cent were had only a little damage. Major damage was face by about three per cent of the respondents and 0.2 per cent experienced catastrophic damage.

### 3.12.2. Flood:

The details collected about the impact of flood in the study area, presented in figure 14, shows that 48 per cent of the respondents reported the occurrence of flood in the study area during the last five years. About 42 per cent of the respondents opined that the area is prone to flooding and 62 per cent told that their water source gets dirty due to flooding or heavy rainfall.

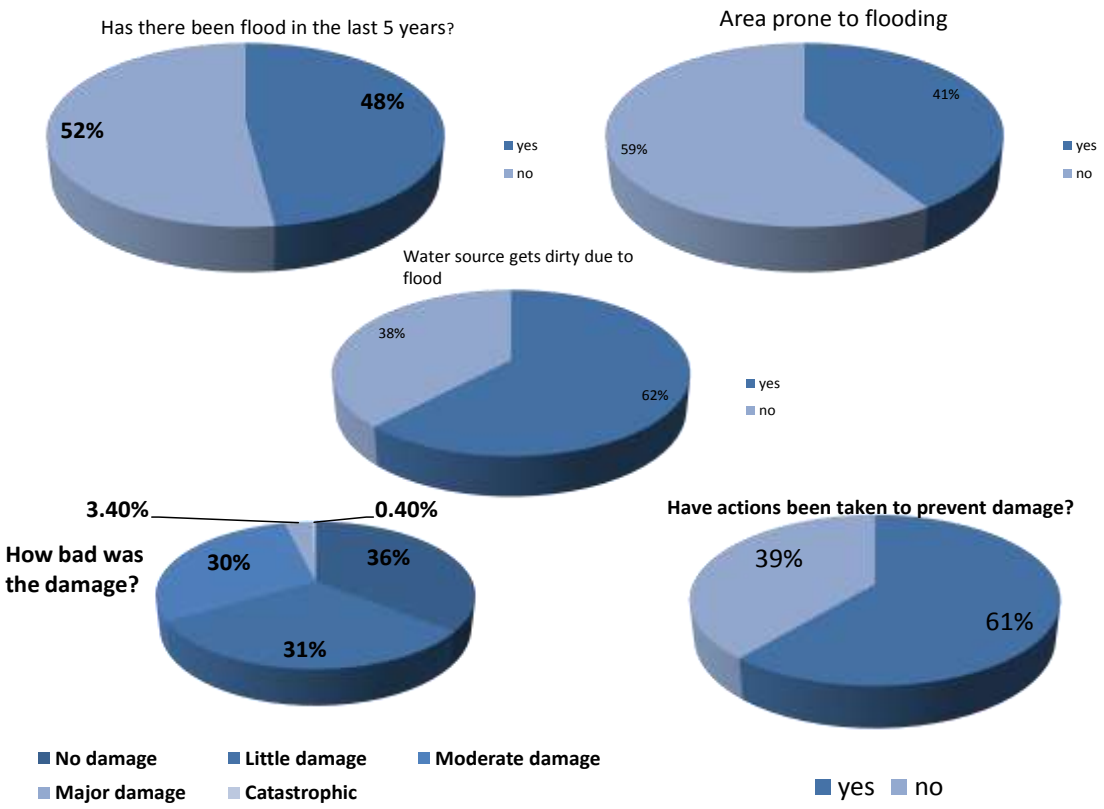


**Fig 14:** Effects of flood.

The statistics gathered about the damages caused by the flood reports that while major damage happened to the three per cent of the respondents, moderate damage occurred for about 30 per cent of the respondents. No damage was reported by 36 per cent of the respondents and a little damage was reported by 31 per cent. About 61 per cent of the respondents are of the opinion that actions have been taken by the household to prevent damage.

### 3.12.3. Drought:

The major info about the occurrence of drought in the study area is presented in figure 15. The data shows that about 64 per cent of the respondents told that there has been a drought in the last 5 years in the study area. About 80 per cent of them were directly impacted by the drought. The statistics regarding the damage caused by the drought shows that no damage happened to 47 per cent of the respondents while 35 per cent experienced a little damage, and 12 per cent faced a moderate damage. About four per cent of the respondents experienced major damage and 1.4 per cent experienced catastrophic damage due to the drought.

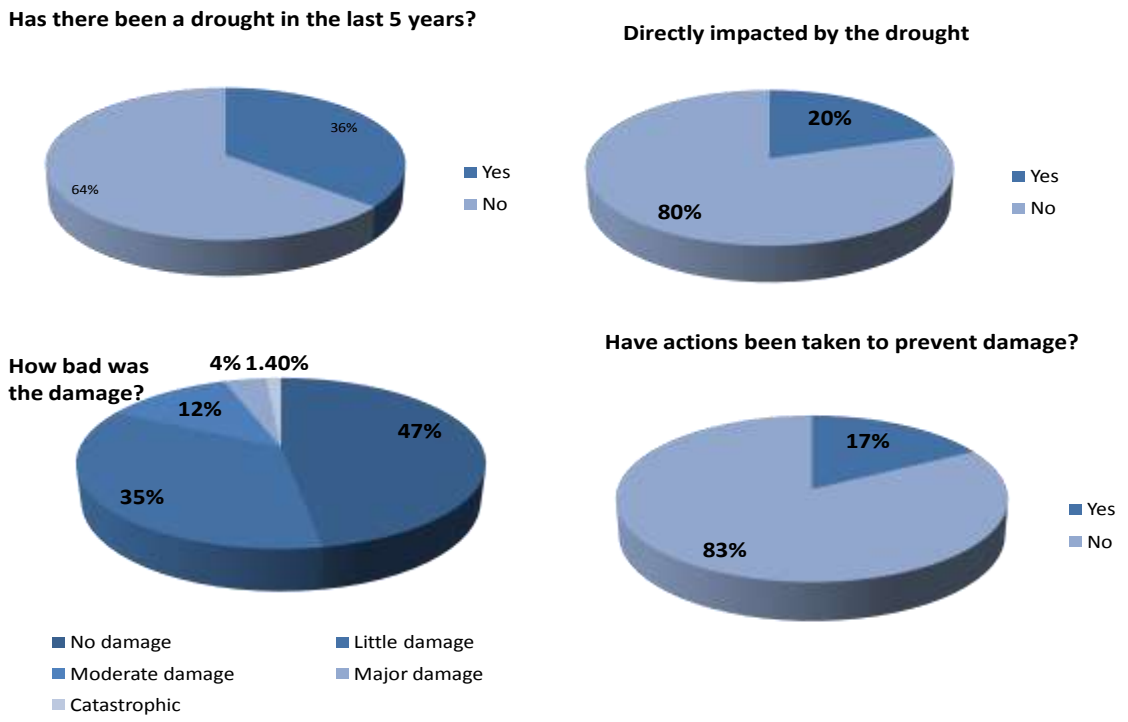


**Fig 15:** Effects of drought

Around 83 per cent of the respondents complained that no any actions been taken by the household to prevent drought damage.

### 3.12.4. Shoreline changes:

The briefing of the data portrayed infigure 16 can provide a better picture of the shoreline changes happened in the study area. The study reveals that there have been shoreline changes in the area over the years according to the response of the fishers. A major share of the respondents (86 per cent) supported this report and about a three quarter of the respondents opined that they have noticed places in their area eroded by the sea.

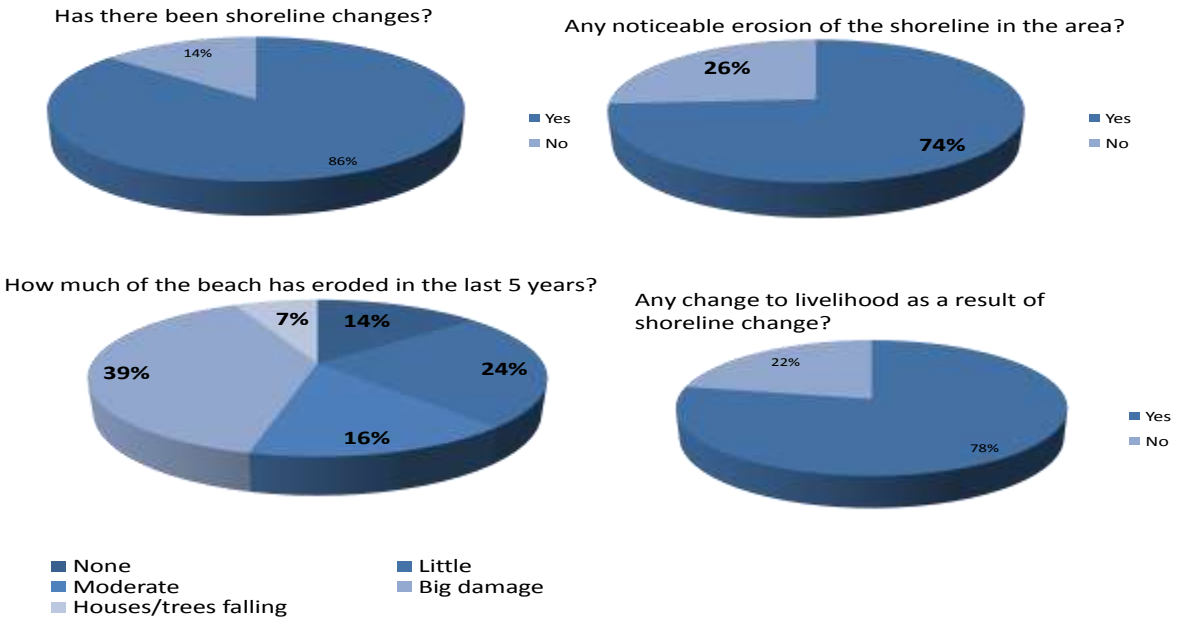


**Fig 16:** Details of shoreline change

According to the specifics obtained from the fishers, big damage has happened in the area due to the erosion of beach in the last five years. Around 40 per cent of the respondents are of this opinion while 24 per cent reported that the damage was little. Only a seven per cent has experienced huge damage like the destruction of houses/ tress due to erosion.

## Conclusion

The study examined the socio economic profile of the fisherfolks in the Poonthura fishing village of Thiruvananthapuram district, Kerala. By analysing the data collected from the 500 fishermen selected randomly from the village, a clear picture of the socio economics status of the fishers is presented in the study. Fishing is found out as the major economic activity of the village and the whole population are fishers. Eventhough 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. More than half of the respondents (54 per cent) believe that being independent is the good thing about being fisher while 38 per cent thinks that it is the best thing. A very high emotional attachment to the fishing activity is found among the respondents as 63 per cent of them reported that they are very proud to introduce themselves as a fisher. Still, the scarcity of resource and the uncertainty of the job are making the fishermen to turn away their coming generations into some other fields. The results point out the reduction in the fish resource as the major reason for the uncertainty in a

fisher's life. 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, the study shows that a major share of the fishers don't know any other jobs. Around 87 per cent of the respondents are having at least primary level school education. Most of them are ignorant about the governmental provisions and supports. Even though they are working in very risky situations, more than half of the respondents (58 per cent) are not having any types of insurance, according to the study. The study revealed that almost 90 per cent of the respondents are earning within Rs 10,000 per month, but still a better share (89 per cent) of them reported that they are not having any savings or money put aside for emergencies. About 80 per cent of the respondents are having mortgage on their house and around 83 per cent of them owe money to someone.

The income inequality measured with the help of Lorenz curve resulted a Gini coefficient of 0.495 which indicated a noticeable level of income inequality in the community. In regard with the food security, 91 per cent of the respondents are having fresh fish daily as a meal, and may be due to that a lion's share (81 per cent) of the respondents are not having anyone in their home chronically ill. All of them are possessing most of the basic amenities in their household assets, still hygiene is a luxury in the locality. More than half (53 per cent) of the respondents are following improper management of the waste water and rubbish. Proper awareness campaigns have to be carried out to protect the locality. According to the study, around 37 per cent of the respondents are interested in learning new ways to improve their business skills. This indicates that there is ample scope to increase the income and thereby the living status of the fishers by providing proper knowledge about the improved fishing and fish culture practices on scientific basis. 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.

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