



MYTHS AND REALITIES IN THE PERCEPTION OF CLIMATE CHANGE AMONG THE FISHERS IN KERALA

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ABSTRACT

The exposure to bio physical and socio-economic impacts of climate change are largely affecting the coastal community, owing to the very nature of their high dependency on marine resources makes the community more vulnerable. However, the poor understanding of the range of possible impacts of climate change by the community is a limiting factor to take up adaptation and mitigation options and to make the community more resilient. Hence, this study is to assess the level of awareness of the community on different features of climate change in the two selected vulnerable coastal villages of Ernakulam district, namely Ochanthuruth and Njarackal, using comprehensive interview schedule, was administered across 300 households. Perception analysis and Garrett ranking were employed to evaluate the scenario. The results revealed that 97 percent of the sample opined that the temperature is the most significant visible feature of climate change. Substantial reduction in income with a score of 94.44 and reduction in fish catch with a score of 73.04 were found to be the major problems perceived by respondents in relation to climate change. However, their awareness on climate change seems to be very shallow as they could not properly delineate their climate change problems from others.

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Introduction

Climate change has the potential to affect all natural systems thereby becoming a threat to social, political, and economic development of the larger populace and their survival (Blessing *et al.*, 2011). Climate change has to be understood as an ongoing process, which is not always visible as it is covered under a spate of other concerns.

Indeed, it is not a new problem in the fisheries sector, and the fisherfolk have been experiencing its impacts even before the term "Climate change" gained popularity. Interestingly, many problems and issues in the fisheries sector could possibly be linked with climate change. However, the inter linkages does not define the plight clearly due to the complex overlying, which is hard to separate.

Nevertheless, it is the fact that bio-physical and socio economic changes impacts of climate change is badly affecting the fisher folk, evident from the changes in distribution and productivity of marine fish stocks consequent to ocean acidification, habitat damage, changes in oceanography, disruption to precipitation and freshwater availability (Daw, *et al.*, 2009). Amidst the inherent problems of coastal communities, the exposure to diverse range of direct and indirect climate impacts, owing to their proximity and dependency to marine resources, make them highly vulnerable. Moreover, the level of adaptive capacity of the community is often the determining factor that creates human vulnerability hotspots (Maharjan *et al.*, 2011).

The climate change has multidimensional impacts on environment, fishery, social, economic and development drivers. The perception level of the primary stakeholders leads to their proactive participation in disaster management plans (Shyam *et al.*, 2014). Considering the complex overlaying nature of climate change problem, it is difficult to explicitly delineate climate change problems by the community in this changing environment. However, climate change specialists have pointed out that awareness and proper understanding of the problem is a prerequisite to develop long term plans and policies for the people (Adetayo, 2012). 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. Furthermore, local fishers are considered as an integral part of the ecosystem, and their perception on the changing environment would play a vital role in formulating disaster management, adaptation and mitigation plans for the

present and future (Shyam *et al.*, 2014). Hence, level of awareness, experience and indigenous knowledge associated with adaptation and mitigation is crucial to make long term plans and policies for the community in combating climate change issues.

A study by Amalia *et al.* (2011) reported that the people who had experienced severe events like storms, flooding had greater awareness of climate change, which is in contrary with the results of a study from Nigeria, where people who were solely depending on experience than other sources, have very minimal awareness about climate change (Aphunu and Nwabeze, 2012). Since the exposure to climate change shocks in the study area is high, it is assumed that fisher community in this study is having better awareness about climate change which need to be explored through this study. Therefore, the objective of this study is to assess the level of awareness of the community on different features of climate change and thereby analysing adaptive capacity of the community and analyse the extent of mitigation measures required to make the community resilient.

Materials and methods

Ernakulam is the second most vulnerable coastal district of Kerala, which has got highest landings across the state and abodes more than 9.82% of total population (Ministry of Agriculture, CMFRI, 2012; CMFRI, 2010). This study is based on the primary data collected from traditional fisherfolk households of selected coastal villages of Ernakulam district. The study areas were selected based on the Patnaik and Narain Method (2005) of social vulnerability assessment. The major parameters considered include number of fishermen households, number of traditional fisher families, number of BPL

families, total fisher population, average family size, sex ratio, literacy ratio, adult child ratio, number of active fishermen etc. In order to compare adaptation and mitigation options across different villages, Njarackal (highly vulnerable village) and Ochanthuruth (moderately vulnerable village) were selected (Table.1). Ochanthuruth village was found to be moderately vulnerable on account of better alternative avocations available in comparison with Njarackal, owing to the

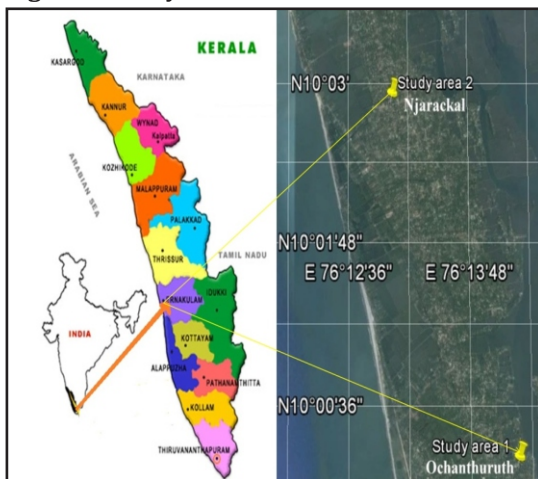
presence of many industries and development projects such as LNG (Liquefied Natural Gas) terminal in its immediate surroundings (Figure 1).

During the period between February and May 2014, a total of 300 households were selected randomly from both villages, with 150 respondent households, from each village. The study covered the respondent households located within 100 meters from the shoreline.

Table 1. Social vulnerability assessment matrix of Ernakulam district

| Sl.No | Village | Score | Rank | Sl.No | Village | Score | Rank |
|-------|-----------------|-------|------|-------|--------------|-------|------|
| 1. | Ayyampally | 5.10 | 18 | 12. | Malipuram | 6.19 | 14 |
| 2. | Azeekal | 7.53 | 7 | 13. | Manassery | 7.09 | 9 |
| 3. | Chellanam | 11.76 | 2 | 14. | Maruvakkad | 6.00 | 15 |
| 4. | Cherai | 6.45 | 11 | 15. | Munambam | 9.70 | 3 |
| 5. | Cheriyakadavu | 4.39 | 20 | 16. | Njarackal | 12.16 | 1 |
| 6. | Edavanakad | 7.00 | 10 | 17. | Nayarambalam | 6.38 | 13 |
| 7. | Elamkunnappuzha | 7.50 | 8 | 18. | Ochanthuruth | 8.32 | 5 |
| 8. | Fort Cochi | 3.83 | 21 | 19. | Pallipuram | 7.78 | 6 |
| 9. | Kandankadavu | 6.40 | 12 | 20. | Pazhangad | 5.22 | 17 |
| 10. | Kannamaly | 9.06 | 4 | 21. | Saudi | 4.94 | 19 |
| 11. | Kuzhuppilly | 5.91 | 16 | | | | |

Figure 1. Study area



Personal interviews were conducted with the help of a structured interview schedule that was used after trial run. The primary data was recorded on gender, age, education and occupation. Data regarding fishers' perception on the impacts of climate change on resources and resource users, sources of information on climate changes, perception about adaptation and mitigation options were also collected.

The study used the following methods of analyses to present the details in a logical manner as well as to depict meaningful conclusions on community perceptions about climate change

Tools of Analysis
Perception analysis

Perception analysis was used to assess respondents' perception on visible features and causes of climate change, source of information, impact of climate change on resources and resource users, adaptation and mitigation options etc

Garette Ranking Technique

Garette Ranking Technique (Garrette, and Woodworth, 1969) was employed to rank the perception of respondents on the impact of climate change on resource and resource users. The order of value given by the respondent for each attribute was transmitted into scores. For converting the scores assigned by the respondent towards the particular problem, percent position was worked out using the following formula:

$$\text{Percent Position} = \frac{100 (R_{ij} - 0.05)}{N_j}$$

$$\text{Percent Position} = 100 (R_{ij} - 0.05) / N_j$$

Where,

Rij = rank given for the ith respondent by the jth attribute

Nj = number of attributes

Results and discussions

Socio-economic characteristics of respondents

The socio economic characteristics of the respondents across the two villages of Ernakulam District viz., Ochanthuruth and Njarackal, were collected and computed (Table.2). The parameters taken into consideration include, gender, age and educational status of the respondents. Majority of the respondents were male, constituting 70 per cent of the total respondents in Ochanthuruth and 74.51 percent in Njarackal. As the study coincides with the lean season most of the fishers were available in their households for the survey.

Table 2: Socio-economic characteristics of respondents

| Variables | | Ochanthuruth | Njarackal | Pooled |
|-----------|------------------|--------------|-------------|-------------|
| | | Frequency | Frequency | Frequency |
| Sex | Male | 119 (79.00) | 105 (70.29) | 224 (74.51) |
| | Female | 32 (21.00) | 45 (29.71) | 76 (25.49) |
| Age | 15-35 | 24 (16.00) | 30 (20.00) | 44 (14.67) |
| | 36-50 | 60 (40.17) | 53 (35.51) | 114 (37.65) |
| | >51 | 65 (43.33) | 74 (49.33) | 139 (46.33) |
| Education | Illiterate | 1 (0.96) | 3 (2.17) | 4 (1.57) |
| | Primary | 59 (39.42) | 38 (25.36) | 97 (29.80) |
| | Upper Primary | 61 (40.38) | 41 (27.54) | 102 (31.37) |
| | High school | 17 (11.54) | 57 (37.68) | 74 (25.10) |
| | Higher secondary | 10 (6.73) | 7 (4.35) | 17 (5.10) |
| | Degree/Diploma | 1 (0.96) | 4 (2.90) | 6 (1.96) |

Figures in parenthesis indicate percentage to total

Age: The age wise distribution of the respondents indicated that majority of the respondents belonged to the elder group (>51) which constituted 43.33% of the total respondents in Ochanthuruth and 49.33% in Njarackal, followed by the middle age group (36-50) with 40.17% and 35.51% respectively. The younger age group of (15-35) respondents represented the least in the awareness survey with a total of 14.67% in Ernakulam district, indicating the dwindling interest of youngsters in fishing sector.

Education: Literacy rate of the respondents was found to be very high, (98%) however, it was found that more than 60% of the respondents were only functional literates. This could be a caution in availing their educational skills in preparing adaptation & mitigation plans. Education is a basic right for all human beings and an essential prerequisite for infusing self confidence, reducing poverty, improving living conditions and building a food secure world which are integral to the livelihoods of many small scale fishing communities (FAO, 2006; Shyam *et al.*, 2013; Shyam *et al.*, 2014). The respondents having primary and upper primary education who possess the basic skills of reading, writing and calculating, were categorized under functional literates.

Climate change and community perception : Climate change is a universal phenomenon and a new realism that affects all facets of human life. There are myriad of issues surrounding the observable and accelerating changes to the earth's climate. For this reason, awareness creation is a key measure to address the impact of climate change. This should be slowly inculcated among fishermen households of the country. Thus, it was important to ask the households whether they have heard about climate change in their vernacular language. Higher level of knowledge and experience leads to awareness.

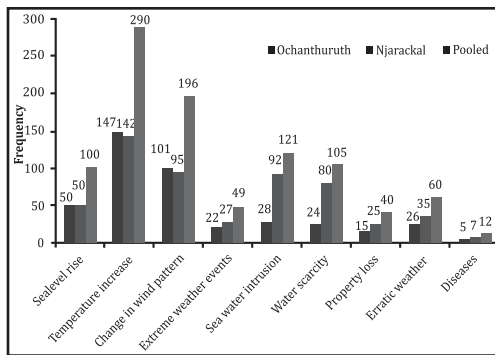
Across the villages, 98% of the respondents have heard about climate change at one time or the other, but a keen look gave a different picture, it was found that the awareness on climate change was less than 40%. There is discrepancy between "hearing" and being "aware" about climate change, the difference stems from the fact that hearing equals superficial knowledge on the issue, here being climate change. The major source of information about hearing climate change could be from various media, friends, relatives etc but awareness involves an in-depth understanding about climate change which indicates that the people know the causes, impacts, and the consequences, as well as the society's need and commitment towards its preparedness and adaptation measures. The perception/ response of fisher community in Ernakulam district about various aspects of climate change namely causes and visible features of climate change, its impact on resources and resource users, sources of information and suggested adaptation and mitigation programs are discussed below.

Community perception on visible features of climate change : The perception on the visible features consequent to climate change is the extent to which the respondents agree to the variables that affect them the most, such as sea level rise, temperature increase, change in wind pattern, extreme weather events, sea water intrusion, water scarcity, property loss, erratic weather, diseases etc.

The participants were much readier in agreeing that the local climate is changing rather than acknowledging the fact about global temperature rise. A large proportion of respondents indicated that the local climate has been altering since their childhood. Almost all the respondents agreed that climate change is affecting them.

However, they felt the impact differs and 97 percent of the respondents were of the opinion that the temperature rise (excessive heat) is the greatest, affecting variable in the context of visible features of climate change, followed by changes in wind pattern (65 percent), sea water intrusion (40 percent), availability of water (35 percent), erratic weather (20 percent)(Figure 2). The study is in sync with George (2010) where he observed that the fish farmers perceived climate change effects from sustained changes over time in environmental temperatures, rainfall intensity as well as pattern and also variability in winds.

Figure 2. Perception on the visible features consequent to climate change



According to the respondents global warming is the rise in the temperature of the earth's lowest atmosphere. The respondents expressed their discomfort in context with the temperature rise when compared with the previous years. The uneasiness was explained in terms of profuse sweating and heat during the day hours and the lack of sea breeze during the night hours. They anguished their dependency on electricity, as it was impossible for them to live without fans, this also added extra burden in terms of their increased electricity bills.

Forty percent of the fishermen households conceived the perception that consequent to sea water intrusion and

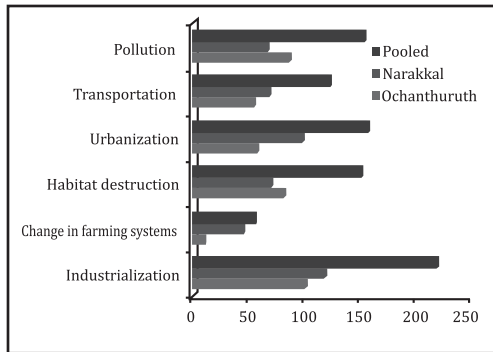
inundation, fresh water sources are going deeper, which has given rise to a situation where potable water is becoming scarce. Sea water intrusion is a severe problem in Njarackal village. It was observed during the data collection that few houses were abandoned and the family members had shifted to other locations due to water logging and saline water intrusion. Repercussion of tsunami is evident in the area since majority households had experienced damage to their houses and fishing equipment. Furthermore the respondents were experiencing sea water seepage through the seawall, during high tides. This had a negative effect on vegetation as the land in course of time was turning unsuitable for any form of cultivation. Moreover salt deposition was witnessed in the land adjacent to the sea

According to respondents, erratic weather is the fluctuation in the timings of monsoon and the reduction or increase in the amount of rainfall received. The participants voiced their views that there was an uncertainty in the raining pattern and it is becoming very difficult for them to predict the rain owing to the drastic changes in seasonality of monsoon. Property loss and displacement are ensued due to flooding resulted by excessive rainfall. The study revealed a surprising finding that the sea level rise was considered to be a minor concern for almost 33 percent of the respondents.

Level of awareness on significant causes of Climate change : Respondents were asked to prioritize major causes of climate change including, pollution, transportation, urbanization, habitat destruction, change in farming systems, industrialization etc. as per their knowledge. The evidence from the survey showed that people in general have a vague picture of the underlying causes and the expected and observed effects of climate

change. Moreover, the community's understanding about the causes of climate change was narrow and chaotic. Majority of the respondents claimed that climate change was the result of human activities, rather than a result of natural variations where 72 percent of the respondents strongly believed that climate change is due to the aftermath of industrialization and subsequent urbanization, habitat destruction, pollution and transportation etc (Figure 3).

Figure. 3: Perception on the causes of climate change



Ochanthuruth and Njarackal are the two villages which are situated in the southern and central part of Vypin island respectively. The commissioning of the Goshree bridges in 2004 has greatly improved the connectivity to Vypin island, from the mainland of Ernakulam. Since both these villages are located in the proximity of Cochin city where the industrial development process are occurring on a faster pace, they experienced positive and negative implications of industrialization. They could correlate the negative impacts of urbanization and industrialization with changing climatic conditions.

Compared to Ochanthuruth, respondents of Njarackal were more prone to natural disasters which are reflected in

their higher awareness about the causes of climate change. It is in line with the results of previous studies in which people who had experienced severe events (storms and flooding) had greater awareness of climate change (Amalia *et al.*, 2011).

Impact of climate change on resources :

Respondent's perception on the major impact of climate change on resources including catch reduction, increased efforts in fishing, migration of fishes, varied catch composition, shift in spawning seasons, temporal shift in the species availability, loss in craft and gear, occurrence of invasive species, alterations in fishing seasons, depletion of farm and inventories, non-availability of regular species etc. was varied. These were prioritized using Garette ranking technique and the result illustrates that the reduction in fish catch was found to be the most significant impact of climate change with a score of 73.04, followed by increased efforts in fishing (65.66) (Table.3). Half of the total respondents were of the opinion that fishing effort has increased over the years in congruence with reduction in fish catch. At this point fisherfolk rely upon available ways to increase fish catch and subsequent income by stretching out their fishing area and efforts. This is followed by varied catch composition (57.70) and migration of fishes (57.47). According to some respondents many species like pomfrets, sharks, rays sardine, and mackerel were only available in small quantity or absent. Another remarkable feature detailed by the fisherfolk is the occurrence of invasive species (46.30). The number of puffer fish which is caught while fishing is very high in the recent past than ever before and it yields huge loss to the traditional fishermen as it damages the fishing gears.

Impact of climate change on resource users : Respondent's perception on major

Table 3. Garette analysis- impact of climate change on resources

| Sl.No: | Parameters | Score | Rank |
|--------|--|-------|------|
| 1 | Catch reduction | 73.04 | I |
| 2 | Increased efforts in fishing | 65.66 | II |
| 3 | Migration of fishes | 47.73 | V |
| 4 | Varied Catch composition | 57.70 | III |
| 5 | Shift in spawning seasons | 42.24 | VIII |
| 6 | Temporal shift in the species availability | 57.47 | IV |
| 7 | loss in craft and gear | 46.62 | VI |
| 8 | Occurrence of invasive species | 46.30 | VII |
| 9 | Alterations in fishing seasons | 41.26 | IX |
| 10 | Depletion of farm and inventories | 35.60 | XI |
| 11 | Non availability of regular species | 35.96 | X |

impacts of climate change on resource users including displacement of family members, increase in food security issues, migration of people, substantial reduction in income, seasonality in employment, shift in employment pattern, increased cost of fishing, reduction in fishing days, shift in agriculture crops were also prioritised using Garette ranking (Table. 4). Fisher households were dependent on coastal and marine goods and services to a great extent, which serves as an important indicator as to how sensitive they could be in relation to climate events. There is a close association between climate change issues affecting the fishery resources and resource users. Results illustrate that substantial reduction in income was found to be the most prominent impact of climate change perceived by the respondents with a score of 94.44. Respondents were of the opinion that income level of fishers has decreased substantially over the years. In addition, the reduction in fish catch would directly impact the employment patterns of the fishing community.

Secondly climate change stimulated the issue of food security among

fisher community (83.33). The community shared their apprehension regarding the rising food security issues among the fisher families. According to many respondents the availability of many species like pomfrets, sharks, rays, sardine, and mackerel was reduced over years. Furthermore, sardine which is known as "*Kudumbam pularthi*", the most abundant species available for consumption for the community in the past, is also not readily available now, even for consumption to the fisher folk, thereby magnifying the issue of food security. This issue of food security is aggravated due to the current employment pattern of fishermen. Many were not willing to make a temporary shift from their traditional employment, even in the lean period. Moreover, the increase in saline water intrusion is limiting the scope of homestead agriculture which also aggravates the food security issue.

Reduction in fishing days was also considered as another major impact of climate change, according to the respondent fisherfolk (72.22). They further explained that fishing operations were gradually becoming non-profitable due to

Table .4 Garrette analysis - impact of climate change on resource users

| Sl.No: | Parameters | Score | Rank |
|--------|----------------------------------|-------|------|
| 1. | Displacement of family members | 16.67 | VIII |
| 2. | Increase in Food security issues | 83.33 | II |
| 3. | Migration of people | 27.78 | VII |
| 4. | Substantial reduction in Income | 94.44 | I |
| 5. | Seasonality in employment | 61.11 | IV |
| 6. | Shift in employment pattern | 50.00 | V |
| 7. | Increased Cost of fishing | 38.89 | VI |
| 8. | Reduction in fishing days | 72.22 | III |
| 9. | Shift in agriculture crops | 5.56 | IX |

diminishing returns and are not sufficient to meet even the operating costs. Consequently there was tremendous drop in the average number of fishing days. Fishing labourers, who share one third of the total revenue of the catch, suffered heavily with substantial wage losses due to decrease in catch. This was experienced more by the respondents of Njarackal than the respondents of Ochanthuruth. Some of the respondents have secondary employment opportunities apart from capture fisheries which include net mending and weaving, supply and repair of fishing equipment and gear, boat building, running provision stores, marketing, processing and transporting of fish, fish exports etc. Diverse income sources may also indicate higher willingness to change occupations in the face of hazards or other impacts. Research has shown that households with higher numbers of income sources are more likely to leave declining fisheries than those with fewer income sources (Cinner *et al.*, 2009).

The seasonality of employment was in the fourth position with a score of 61.11, as per the ranking followed by change in employment pattern (50.00) and migration of people (27.78). These issues

are in congruent with the fluctuation of fish stocks seasonally in abundance and availability producing high and low fishing seasons. Nearly 46 percent of the respondents reported that there is considerable change in employment pattern (shift from fisheries to other sector). There were many inter-sectoral labour migrations in these villages and many were travelling to Ernakulam city in search of alternate avocation options. They are mainly engaged in jobs like construction, carpentry and masonry. In addition, majority of the people belonging to younger generation were not interested to engage in their traditional livelihood options and hence the labour migration is expected to be high in the future. The full time fishermen, in the marine sector, find solace in the inland fishery sector or in other sectors which do not demand much skill (helpers / coolie workers), during the lean period for their sustenance. Many cases of displacement and migration were observed in the villages due to multiple reasons including water logging and the search for alternate avocation.

According to Allison *et al.* (2009) and Perry *et al.* (2011), coastal livelihoods of fisheries and fishery dependent

communities have depended on the capacity to cope with changes in fluctuations of fish stocks, extreme weather events and natural changes in climate and sea level throughout history through the alteration in fishing practices or switching to alternative livelihoods. Households that rely on a single economic sector for their livelihood (fishery) are more vulnerable to climate impacts than those that have a diversified economy, especially if they are highly dependent on sensitive resources.

Sources of getting information about climate change awareness : In general, rural population of Kerala rely on television, radio and newspaper to obtain information concerning local and global happenings, as they are the cheapest and the most popular means. The results show that major sources of information concerning climate change was available through electronic media including television and radio, for majority of the respondents, which constitutes 81.88 percent of the respondent fisher folk of Njarackal and 54.59 percent of Ochanthuruth (Table.5).

As majority of the respondents were functional literates, print media was

also equally usable by the respondents and 60 percent respondents from Njarackal and 40 percent from Ochanthuruth were making use of this to get climate change information. Word of mouth also was another means of getting information on climate change to a large number of respondents (59.33 percent in Njarackal and 39.56 in Ochanthuruth), usually conveyed through people from immediate surrounds namely family members, friends and neighbours. The very nature of coastal village, characterized by high population density, gives ample scope for spreading any information among them through word of mouth. Community organisations, educational institutions and NGOs also constituted another important source of information for 45.33 percent of respondents in Njarackal and 30.22 percent in Ochanthuruth. A small percent of fishermen depend on meteorological services for getting early warnings about predicted extreme events, in relation with their fishing grounds. A total of 15 percent of the respondents reported that announcements and alerts given by the local self-governments were very informative in preparing themselves to cope with the expected extreme weather conditions.

Table 5 . Sources of getting information about climate change awareness

| Sources of Information | Njarackal | Ochanthuruth | Pooled |
|---|-------------|--------------|-------------|
| Family members, friends,& Neighbours | 89 (59.33) | 86 (39.56) | 175 (58.33) |
| Community organizations, NGOs, educational institutions | 68 (45.33) | 62 (30.22) | 130 (43.33) |
| Electronic media | 123 (81.88) | 82 (54.59) | 205 (68.33) |
| Local self Government | 38 (25.36) | 25 (16.91) | 63 (21.00) |
| Meteorological services | 7 (4.35) | 4 (2.90) | 11 (3.67) |
| Visiting climate scientists/experts | 10 (6.52) | 7 (5.67) | 17 (5.67) |
| Print Media | 91 (60.67) | 80 (40.44) | 171 (57.00) |
| Announcement & Alerts | 30 (20.29) | 15 (13.53) | 45 (15.00) |

Figures in parenthesis indicate percentage to total

Adaptation and mitigation options available within the community :

The knowledge on climate change among the respondents of both these villages was very shallow and pertained to short term happenings. Within their limited knowledge they expressed their enthusiasm by suggesting many adaptation and mitigation options to make the community resilient to climate change consequences which includes sea wall construction, livelihood diversification through skill development programs, promotion of income generation activities through self help groups, bio-fencing of their area by mangrove planting, implantation of welfare measures for the fisherfolk, improved safety, communication and rehabilitation facilities during emergency, and provision of better infrastructure facilities. In general, the availability of alternative and supplementary livelihoods and the degree to which they are dependent on resources potentially impacted by climate, could influence the adaptive capacity of a household and its level of vulnerability. The fishers are believed to be not able to relate climate change in its rightful context nor are they able to visualize the integrated and chain events and understand its synergistic nature; thereby the willingness to participate and contribute in the climate change mitigation and adaptation strategies is negligible.

Conclusion

Coastal regions around the globe are witnessing the manifestation of the changing climate, which is impacting the major communities, *i.e.* the fishing villages, who live by the sea and solely depend on it for their livelihood. In the chosen study villages of Ochanthuruth and Njarackal of Ernakulam district, the impact of climate change was felt on both resource and

resource users; where, resource primarily includes fishes and resource users indicates fishermen. Three hundred respondent households were chosen for the study. The chosen respondent community represents the community as a whole, which translates to the village, and further to the district and finally to the state. By extrapolating the methodology used similar kind of analysis can be carried out for other coastal states of India.

The impact of climate change has led the study area in becoming vulnerable, based on the principle factors of sensitivity, adaptive capacity and exposure. The first step in accomplishing a society to become resilient to climate change is to bring awareness on the same. The study revealed that though more than 89.6 percent of the respondents have heard about climate change through various forms of mass media, *viz.* print and audio-visuals, and through word of mouth; their awareness seem to be very shallow. This may be due to the fact that fishers could not correlate the changes in their environment to climate change, but with further probing it was found that there were many visible parameters that they complied with, which were felt as possible reasons for climate change; the reasons being temperature, change in wind pattern, sea level rise, sea water intrusion etc. On further inquiring, it is found out that the issues in the day to day life as well as fisheries sector which the respondents connects with climate change, may not necessarily be true with regard to climate change process. This is because, many issues of the fisherfolk were overlaid with climate change issues and by which they could easily identify their concerns of the present and future in relation to climate change. However, in-depth knowledge is required to find out interlinkages of climate change issues in their life and thereby developing adaptation mitigation plan for

the community. Hence imparting awareness on climate change among different communities is the need of the hour to make them involved in developing adaption and mitigation plan for the community.

In conclusion, awareness on climate change is a prerequisite to initiate steps in combating negative impacts of climate change. Though changing climatic condition is a global concern, the possible mitigation options for improving adaptive capacity needs to be local. An integrated approach comprises of actions for addressing long term and short term concerns of the community, through grass root level actions which would have to be initiated in materialising local solutions to compact the cumulative impact of climate change.

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