



Perceptual Social Impact of Flood – A Study on Kerala Floods

BASHEER K.S¹ and Dr.RUPAGUNASEELAN²

¹Full Time Research Scholar, BSMED, Bharathiar University, Coimbatore, Tamil Nadu

²Professor and Director i/c, BSMED, Bharathiar University, Coimbatore, Tamil Nadu

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Abstract

This study assesses the perceptual notion of social and community impact that has caused due to the impact of floods in Kerala. The vulnerability and resilience of the local communities are key concepts in this study. Most households are vulnerable to flood hazards. It is therefore important to measure their levels of perceptual vulnerability and assess their responses for current and future planning. A perceptual index was used to measure the extent of flood vulnerability. Key informant interviews, field surveys and household questionnaires were used to collect the data. The results show that vulnerability to flood in this community is determined by the nature of soil, dwelling type, employment, education and amount of rainfall in a season. The study recommends that public awareness campaigns, early warning systems and improved disaster management strategies must take into consideration differentiated levels of vulnerability and community coping mechanisms and preferences.

Keywords: Perception; Flood Susceptibility; Exposure; Flood Perceptual Index; Resilience and Adaptation.

I. Introduction

Over the course of the last few centuries, one of the most pressing issues facing the general public has become the connection between environmental concerns and the effect such concerns have on society. This new emphasis has developed through time, which has led to a rise in interest in risk as a topic. Beginning in the 18th century, the government started devoting more resources toward achieving the new goal of "civil security," which was also referred to as "civil protection" and "civil defence." This idea refers to the assortment of precautions, both during times of peace and conflict, that a state takes in order to ensure the safety of its citizens. "Today, the

population of a state is viewed as a valuable asset that needs to be protected since it is recognised as a source of power through its demographic vitality as well as its economic and cultural production. On the basis of this premise, states have been given a new purpose, which is to safeguard their citizens from a variety of dangers, such as diseases, criminals, and others, as well as those risks connected to natural disasters and those associated to technological breakthroughs (Lascoumes, 2012).

Disasters are serious disruptions to the functioning of a community that exceed its capacity to cope using its own resources. Disasters can be caused by natural, man-made and technological hazards, as well as various factors that influence the exposure and vulnerability of a community.

Natural disasters can cause great damage on the environment, property, wildlife and human health. These events may include earthquakes, floods, hurricanes, tornadoes, tsunamis, landslides, wildfires, volcanic eruptions, and extreme temperatures. Natural disasters generally constitute an emergency since they require immediate intervention due to their high impact on human health and safety; they affect the normal functioning of working infrastructure, interrupting normal day activities and representing a risk for residents and workers in affected areas. Disasters happen when a community is "not appropriately resourced or organized to withstand the impact, and whose population is vulnerable because of poverty, exclusion or socially disadvantaged in some way" (Masozera, et al 2007).

Disasters therefore can and should be prevented. We can prevent hazards from leading to disasters by helping communities to be prepared, reduce their risks and become more resilient.

Natural hazards are naturally occurring physical phenomena. They can be:



- **Geophysical:** a hazard originating from solid earth (such as earthquakes, landslides and volcanic activity)
- **Hydrological:** caused by the occurrence, movement and distribution of water on earth (such as floods and avalanches)
- **Climatological:** relating to the climate (such as droughts and wildfires)
- **Meteorological:** relating to weather conditions (such as cyclones and storms)
- **Biological:** caused by exposure to living organisms and their toxic substances or diseases they may carry (such as disease epidemics and insect/animal plagues)

Man-made and technological hazards are events that are caused by humans and occur in or close to human settlements. They include complex emergencies, conflicts, industrial accidents, transport accidents, environmental degradation and pollution.

Risk can be calculated as the probability of an event multiplied by the impact of that event times some other factors.

CONCEPT OF FLOOD HAZARD

Flood risk is defined by the World Meteorological Organization (WMO) as the projected losses produced by a certain flood at a specific time and is based on three elements (see Figure 1):

- The severity of the deluge and the rate of water increase;
- The vulnerability of human activities to the flood;
- The susceptibility of the exposed components.



Figure 1 Flood risk and mitigation

Flood vulnerability is a community's susceptibility to flood damage. It's the community or

group's failure to predict, cope with, tolerate, or recover from these repercussions. This makes a hazard a disaster. Vulnerability hinders appropriate reactions and magnifies the impact, which might have long-lasting effects. Vulnerability to flooding is the confluence of three broad groups of interrelated, dynamic factors:

Physical or material conditions (poor infrastructure);
Constitutional or biological conditions (weak social solidarity networks);

- Behavioral or psychological conditions (e.g., foreign aid reliance)" (2007)
- Social risk
- Social sciences enter this context.

German sociologist Ulrich Beck is credited with being the first person to use the term "risk" in the context of the social sciences. Beck intended for the term to describe the media, political, and scientific aspects of the process of social risk production. Here, we want to emphasise that risk has become central in a society that, as a result of modernization and its associated economic and technological processes, is increasingly looking to the future (by considering risk phenomena related to capital accumulation, new communication borders, etc.), attempting to predict causality links and "govern" the resulting uncertainty. This is because modernization and its associated economic and technological processes have resulted in a society that is increasingly looking to the future (Beck, 1986). According to Beck, wealth is not the most important factor in risk management. The most fundamental instruments for "risk management" are information and knowledge (due to knowledge, a vague, undecided "threat" becomes at least partly understood, allowing for its "management").

Anthony Giddens, a well-known sociologist who has focused most of his work on risk (Giddens, 1999), is another prominent example. According to him, the dangers of today are distinct from those of the 19th century. The modern world is fraught with perils as a result of human activities (manufactured risks). They are a product of civilization and only a small portion of them are natural (external risks). Risks have a structural nature, which means that they are linked to the mechanisms that keep modern society working, and they cannot be managed on an individual basis. This has a ripple effect on the structure of society.

Along with overcrowding, pollution, flood-prone homes, landslides, and other factors, unemployment, social rejection, insufficient health and education facilities, various types of crime, poor housing, and inappropriate territorial administration may be considered social risk factors. Other



potential social risk factors include unemployment, social rejection, various types of crime, poor housing, and inappropriate territorial administration. When an individual, family, human group, or society accumulates a great number of risk factors (and the severity of those risk factors), it causes more or less severe social exclusion, which leads to destitute living conditions (Mastropietro, 2001).

II. CAUSES OF KERALA FLOODS

There are several reasons that were found, studied, and discussed with the management students about the Kerala flood. Some of the reasons are related to climate changes in Kerala. It includes solar radiation, emission of greenhouse gases, discharge of toxic wastes from industries, and so on. However, detailed investigations are required to understand the exact reasons and the short- and long-term effects of climate change in the state of Kerala. One of the important reasons for the heavy rains in Kerala is the Western Ghats, as it is positioned to enhance rainfall along the west coast as it intercepts the moisture-laden air being drawn in from the warm ocean waters as part of the southwest monsoon circulation. The low pressure in the Arabian Sea attracts the southwesterly winds from the high-pressure Bay of Bengal, gets concentrated over the region due to high moisture in the air and causes rain once it hits the Western Ghats.

Some of the other reasons are as follows:

- High-intensity rainfall in short period
- Heavy rainfall due to climate change
- Human intervention
- Exploitation of nature
- Underlying ground cannot cope with the sheer amount of water
- Deforestation and blockage of natural streams
- Unauthorized encroachments in forest area
- Weak protection of forest resources
- Illegal and rampant stone quarrying
- Changing drainage patterns and sand mining on riverbeds
- Cutting down forests and grasslands
- Digging of pits
- Landslides and landslips
- Wetlands and lakes that acted as natural safeguards against floods have disappeared because of rampant urbanization and construction of infrastructure
- Shoddy urban planning
- Unplanned reservoir regulation
- Cut in mountain slopes and encroached upon
- Choked rivers with sand deposits
- Reduction in the capacity of the rivers and lakes to hold more water due to pollutants in rivers
- Loss of natural support on land
- Insensible use of land, soil, and rocks
- Build of homes and business establishments not as per norms
- Unscientific developmental activities in ecologically sensitive areas

RISK AWARENESS AND PERCEPTION BY THE PUBLIC

The very fact that dangers can be encountered in human society requires us to bring up the question of how to get information and how to make people more aware of these dangers. Another issue that should be taken into consideration is the idea of how risks are perceived.

The social sciences are starting to explore social actors' abilities to know the hazards in their environments and the subjectivity of "objective" threats. Social scientists are beginning to realise the importance of this issue. This conversation began with the question of whether social actors can recognise risks in their contexts. In recent years, this has led to a focus on social actors' comprehension and perception of risks. This has made it feasible to improve the public's catastrophe prevention knowledge and explain how people react to catastrophic situations. This could improve public access to information. Since the 1980s, social scientists have used the social paradigm of catastrophes to question the technological approach. This framework was created to accommodate technology. Political ecology's theories differentiate this new paradigm from the technocratic worldview. [Cite] [Cite] Political ecology concepts influenced this new paradigm (Anzelli&Piguet, 2012). Risk is no longer considered as independent from man and society (as something unique to nature), but as essential to human activities and beliefs. The passage's content changed my outlook. This changes how risk is viewed.

It's also possible to explain it as a person's subjective perception of the possibility of an occurrence based on its likelihood and intensity. Another definition of "danger perception." Depending on the scenario, various factors may cause this perspective to vary. The media, scientific dissemination channels, the Internet, and what other social actors think are examples of elements that can change individuals' risk perceptions. It's a changeable concept, not a fixed one.

This is why threat perception and awareness can vary based on geological, economic, political, and social factors. Numerous research have examined the link between risk perceptions and other factors (Kellens, Zaalberg, Neutens, Vanneuville, De Maeyer, 2011). Based on this research, we can conclude that the subjective experience of individuals (the number of times they have been subjected to flood events) and the frequency with which the phenomenon occurs in a particular region each contribute to how people perceive the threat of flooding. Unprotected risk



regions, which are sensitive to floods but don't suffer them annually, tend to receive less attention. Locals tend to underestimate risk in such situations (Botzen, Aerts, van den Bergh, 2009). In locations where flooding danger is seasonal, the population's impression of the risk level often correlates with the experts' risk level, even though it may be exaggerated or understated. In these places, the population's risk perception matches the experts' (Siegrist & Gutscher 2006). Experience and periodicity being linked shouldn't surprise anyone.

RISK AWARENESS AND PERCEPTION OF THE DIFFERENT KINDS OF FLOODS

One of the fundamental requirements in terms of the risk of flooding is to analyse the connection between the view of the experts on the danger and the perception of these dangers held by the local population, including on the basis of their "history memory." The following stage is to combine the technical and scientific knowledge of the former with the common understanding of the latter in order to more effectively build and manage flood prevention measures, as well as any floods that may occur in the future.

The amount of public knowledge (both in its entirety and in relation to the many categories that are taken into account) and people's perceptions of danger may shift depending on these three variables. For instance, in the event of seasonal or cyclical floods, the majority of which are caused by flooding caused by rivers, the target population may already have a pretty high awareness and perception of the danger. In addition to this, the flooding that results from these types of storms typically develops gradually, in contrast to the sudden flooding that is caused by other types of storms, which makes it simpler to control the risk scenario.

On the other hand, when major flooding occurs, there is a considerably greater likelihood that the populace that is affected is either unaware of the dangers or is only partially aware of them. And when this is not the case, given that these are occurrences that are considered to be of an uncommon character, the precautions taken by the people who are involved are not consistent with the actual amount of danger that is there. This state of affairs is particularly serious in the case of flash floods, which involve the rapid discharge of water in areas where communities are most likely unaware or have little awareness of preventative measures. Flash floods can be particularly dangerous because they occur in areas where communities have little or no awareness of preventative measures. These are

some of the risky scenarios that are the most challenging to manage.

III. RESEARCH OBJECTIVE

The overall aim of the research was

1. to understand the perceptual assessment on Social Impact of Flood of people in flood prone and how they perceive their vulnerability to floods and climate variability. and
2. to investigate the power dynamics at household and societal level and to explore the complexities associated with local adaptation programmes in the flood prone areas.

RESEARCH DESIGN

The research is descriptive in nature. The study intends to identify the factors leading to the comprehensive perceptual assessment in different perspectives of the Socio Economic scenario due to floods. Both primary and secondary data are used in the study. Primary data is required to analyse the assessment in different perspectives of the Socio Economic scenario due to floods. Opinions from the households of the selected Taluks from the selected districts of Kerala. The secondary data is used to collect the data of the households as well as the policy advocacy prevailing in the current scenario. The secondary data is collected from the reports of the District Administration of the Kerala Government.

SAMPLING DESIGN AND TECHNIQUE

The target population, for the study that is, household people from the state of Kerala from the Districts of Wayand, Idukki, Alappuzha, Kottayam, Kozhikode, Malappuram and Pathanamthita. Purposive sampling is entirely based on the judgment of the researcher, in that a sample is composed of elements that contain the most characteristics, representative or typical attributes of the population. Due to time and financial resource limitations, 428 households were randomly sampled and interviewed at community level. The sample size was determined using the Rao Soft http://www.raosoft.com/sample_size.html with 95% confidence level.

INSTRUMENT AND CONSTRUCTS

The primary data is collected through well-structured questionnaires. Seven districts are chosen for this purpose on the priority of the most flood prone areas in Kerala in last one decade. The questionnaire also elicits information on the demographic profile of the households. To develop



the questionnaires, the existing literature was reviewed. The questionnaires are also vetted by a panel of subject experts, statisticians, Government Officials and senior level officers of the District Administration and Disaster Management Team. The questions in the questionnaires are sequentially arranged and the questions are asked in a simple and understandable manner. The respondents are first educated about the purpose of the study and

assurance of confidentiality of the data is given to them.

RELIABILITY TEST

Subsequent to the pilot study, the researcher verified the reliability of the data by using the Cronbach's alpha test (Cronbach, 1951).

Table 1 displays the results of the reliability tests performed on the questionnaire.

Table 1: Cronbach's Alpha for research instrument

| Constructs | Cronbach's Alpha (first 70 respondents) |
|---|---|
| Social Impacts on Individual and Family | 0.647 |
| Poverty | 0.838 |
| Civil Society Role | 0.793 |

From the above tables, it can be inferred that the Cronbach's alpha values in respect of all the constructs has exceeded the threshold limit of 0.6 indicating that the variables used to measure the constructs are reliable. Hence, all the variables included in the constructs possess the desirable internal consistency needed for further analysis. The

questionnaire was distributed to all the selected households from each district. The researcher has made frequent visits to the district and taluk to collect the questionnaires. The final number of questionnaires collected from the respondents are shown in Table 3.3.

Table 2: No. of questionnaires accepted for the study

| No. of questionnaires distributed | No. of questionnaires received | No. of questionnaires rejected | No. of Questionnaires taken for the Study |
|-----------------------------------|--------------------------------|--------------------------------|---|
| 525 | 492 | 64 | 428 |

With the expectation of certain amount of rejection in the responses, the researcher distributed a total of 525 questionnaires which was in excess of the required sample size. After scrutinizing the responses received, the researcher dropped about 64 responses on the whole and the final sample was 428.

IV. ANALYSIS AND DISCUSSION SOCIAL IMPACT OF THE FLOOD

Flooding does not only result in destroyed infrastructure and damaged property, but also has an adverse social impact on citizens affected by the natural disaster. Impacts on physical and mental health can be both short-term and long-term and can result in changes to the livelihoods of affected citizens. While more personal, the social repercussions of flooding have impacts on individuals and families that can be felt in other areas of work and life, therefore, addressing the social impacts of flooding is important for support and recovery efforts after a flood occurs. Floods often have a devastating force. In addition to the

material damage, there is also a social impact. Less visible but longer-lasting. Research shows that those affected are often more heavily burdened by the social impact than by material damages.

It is the mental impact that affects the victims in their daily lives. The floods alter their way of life, their work and how they interact. This may be a temporary impact, but it may smoulder for a long period after the event. Analysis of the aftermath of the floods in Kerala shows a repeated pattern of social impact. A society can be sufficiently resilient for large quantities of water to cause barely any problems. That resilience is lacking and must be fortified to make us better able to face floods.

The social impact develops according to the following pattern: people suffer damage to their homes and possessions during a flood. Some may fall, injure themselves, catch a cold or get sick. In exceptional cases, they may even die. During or before the flood, people are temporarily (sometimes forcibly) displaced. If the homes are damaged beyond repair, their displacement may be



permanent, which means the inhabitants do not return to their neighbourhood. Some neighbourhoods deteriorate. The social cohesion and population distribution is altered. The people blame the authorities for the squalor.

If residents stay in or return to their original homes, they frequently have trouble finding food and water and they lack electricity, clean water and so forth. Their house no longer feels like a safe home. There is a multitude of organisations to deal with for insurance and administration—quite a challenge, especially if there is no electricity. The stress, worry, and fear in this new situation have a severe mental impact. And some, who have insufficient savings, may suffer financial issues as well, temporarily or even permanently. The pressure

on the community may be considerable. Some people draw closer to one another and become a close-knit team. Others may argue and experience severe dissatisfaction. This, too, often causes them to feel angry at the authorities.

The social impact is not felt equally by all. Some are more vulnerable and have more trouble adjusting to the consequences. People with limited financial resources, such as the elderly and those who are movement-impaired, migrants with a limited command of the language and social network, and people who live in outdated houses. These vulnerable groups need extra attention to ensure they too are able to properly recover from a flood.

Table 3 Descriptive Statistics on Social Impact on Flood with reference to Individual and Family

| Statement | Number | Percentage |
|--|--------|------------|
| Reduced availability of food and an adequate diet | 240 | 56.1 |
| Reduced mental health, increased stress, anxiety, alienation, apathy, depression | 115 | 26.9 |
| Personal security status | 22 | 5.1 |
| Decline in the perceived quality of life | 33 | 7.7 |
| Decline in living standards or level of affluence | 18 | 4.2 |
| Worsening of the economic situation, drop in the value of property income | 86 | 20.1 |
| Decrease in autonomy, independence, security and livelihood | 21 | 4.9 |
| Disruption of everyday life, lifestyle (changing habits) | 280 | 65.4 |
| Reduction in the value of environmental commodities | 12 | 2.8 |
| Perception of the community, community cohesion, integration | 29 | 6.8 |
| Community's identification and relationship with the place (belonging) | 334 | 78.0 |
| Change in attitude towards the local community, level of satisfaction with the neighbourhood | 86 | 20.1 |
| Disruption of social networks | 8 | 1.9 |
| Modified perceptions of personal health and security, risk, fear of crime | 403 | 94.2 |
| Modified leisure opportunities | 22 | 5.1 |
| Housing quality | 3 | 0.7 |
| Impact on the homeless | 18 | 4.2 |
| Workload, amount of work required to survive/live decently | 86 | 20.1 |
| Other impacts on this level (specify) | 21 | 4.9 |

Source: Primary Data

SOCIAL IMPACT ON INDIVIDUAL AND FAMILY – SIGN TEST

Floods have a large variety of societal impacts that span across space and time. While some of these impacts are obvious and have been well researched, others are more subtle and less is known about their complex processes and long-term effects. The most immediate and apparent impact of floods is direct damage caused by physical contact between floodwaters and economic assets, cultural heritage, or human beings, with



the result for humans being injuries and deaths. Direct flood damage can amount to billions of US dollars for single events. More indirect economic implications are the losses that occur outside of the flood event in space and time, such as losses due to business disruption. Floods also have long-term indirect impacts on flood-affected people and communities. Experiencing property damage and losing important personal belongings can have a negative psychological effect on flood victims. Much less is known about this type of flood impact. Moreover, flood impacts are not equally distributed across different groups of society. Often, poor, elderly, and marginalized societal groups are particularly vulnerable to the effects of flooding inasmuch as these groups generally have little social, human, and financial coping capacities. In many countries, women regularly bear a disproportionately high burden because of their societal status.

Table 4
Social Impact on Individual and Family- Sign Test

| Sl.No | Particulars | No of + Sign | No of - Sign | N | Z | Result |
|-------|--|--------------|--------------|-----|--------|-----------------|
| 1 | Reduced availability of food and an adequate diet | 273 | 105 | 378 | 8.64 | Significant |
| 2 | Reduced mental health, increased stress, anxiety, alienation, apathy, depression | 198 | 194 | 392 | 0.207 | Not Significant |
| 3 | Personal security status | 278 | 102 | 380 | 9.086 | Significant |
| 4 | Decline in the perceived quality of life | 222 | 166 | 388 | 2.89 | Significant |
| 5 | Decline in living standards or level of affluence | 275 | 105 | 380 | 8.77 | Significant |
| 6 | Worsening of the economic situation, drop in the value of property income | 282 | 99 | 381 | 9.42 | Significant |
| 7 | Decrease in autonomy, independence, security and livelihood | 314 | 64 | 378 | 12.911 | Significant |
| 8 | Disruption of everyday life, lifestyle | 10 | 357 | 367 | -18.07 | Significant |
| 9 | Reduction in the value of environmental commodities | 190 | 194 | 202 | 0.217 | Not Significant |
| 10 | Perception of the community, community cohesion, integration | 278 | 102 | 380 | 9.086 | Significant |
| 11 | Community's identification and relationship with the place (belonging) | 222 | 166 | 388 | 2.89 | Significant |
| 12 | Change in attitude towards the local community, level of satisfaction with the neighbourhood | 275 | 105 | 380 | 8.77 | Significant |
| 13 | Disruption of social networks | 282 | 99 | 381 | 9.42 | Significant |
| 14 | Modified perceptions of personal health and security, risk, fear of crime | 314 | 64 | 378 | 12.911 | Significant |
| 15 | Modified leisure opportunities | 275 | 105 | 380 | 8.77 | Significant |
| 16 | Housing quality | 282 | 99 | 381 | 9.42 | Significant |
| 17 | Impact on the homeless | 314 | 64 | 378 | 12.911 | Significant |
| 18 | Workload, amount of work required to survive/live decently | 273 | 105 | 378 | 8.64 | Significant |
| 19 | Other impacts on this level (specify) | 10 | 357 | 367 | -18.07 | Significant |

Source: Primary data

Through the sign test it is found that there is no significance difference among the respondents

because the variable 'Z value is 0.207 which fall within the acceptable region of the null hypothesis.



It is clearly found in the above table that the Z value is not within acceptable region of null hypothesis ($Z = -1.96$ to $+1.96$). Since the calculated value is within the acceptable region for seventeen variables, the null hypothesis is rejected. Hence, there is a significant difference between the responses towards the variables considered as “yes” for the certain statements. The result of the sign test reveals that respondent of the household are almost positively adapting the Social Impact on Individual and Family in their daily life.

PERCEPTIONAL ASSESSMENT ON SOCIAL IMPACT – FRIEDMAN TEST

The respondents has given their responses by means of rank. In order to assess the respondents’ priority for these variables and the researcher has administered the Friedman test.

Friedman Test is a non-parametric test used to find out the mean rank of each variable. Based on the mean rank it is identified that the priority is given to factors of Social impact on Individual and Family as well as Community and Institutions by the respondents. The null hypothesis is that there is no significant difference among the ranks provided by the respondents.

Table 5 depicts the opinion of the respondents.

Table5: Perceptual Assessment on Social Impact – Friedman Test

| Sno | Individual and Family | Mean Rank | Chi-Square | Asymp. Sig |
|-----|--|-----------|------------|------------|
| 1 | Reduced availability of food and an adequate diet | 4.15 | 36.843 | 0 |
| 2 | Reduced mental health, increased stress, anxiety, alienation, apathy, depression | 2.85 | | |
| 3 | Personal security status | 3.58 | | |
| 4 | Decline in the perceived quality of life | 3.61 | | |
| 5 | Decline in living standards or level of affluence | 3.25 | | |
| 6 | Worsening of the economic situation, drop in the value of property income | 3.45 | | |
| 7 | Decrease in autonomy, independence, security and livelihood | 3.66 | | |
| 8 | Disruption of everyday life, lifestyle | 2.84 | | |
| 9 | Reduction in the value of environmental commodities | 2.15 | | |
| 10 | Perception of the community, community cohesion, integration | 4.12 | | |
| 11 | Community’s identification and relationship with the place (belonging) | 3.88 | | |
| 12 | Change in attitude towards the local community, level of satisfaction with the neighbourhood | 4.79 | | |
| 13 | Disruption of social networks | 3.22 | | |
| 14 | Modified perceptions of personal health and security, risk, fear of crime | 2.41 | | |
| 15 | Modified leisure opportunities | 2.15 | | |
| 16 | Housing quality | 2.66 | | |
| 17 | Impact on the homeless | 3.54 | | |
| 18 | Workload, amount of work required to survive/live decently | 4.08 | | |
| 19 | Other impacts on this level (specify) | 4.64 | | |

Data: Primary Source

Table 5 indicates that P value of 0.00 which is less than the ideal p value of 0.05 and the null hypotheses is rejected at five percent significance level. Hence it is concluded that there is a significant difference between the mean ranks towards



SOCIAL IMPACT - SQUARE TEST

Chi-square is a non-parametric test used to test that there is a significant association between the two variables. The null hypothesis is that there is no association between the individual and family social Impact and community and institutional social impact.

In the result where the significant value is less than 0.05, the null hypothesis is rejected. In order to measure the strength of the association Cramer’s V is used, Cramer’s V helps to measure

the fitness of two nominal variables. Both of the variables have more than 2 categories. The association ranges level from 0 to 1. If 0 says that there is no relationship, if 0 to 0.25 says that very less to moderate relationship then 0.25 to 0.50 indicates that strong relationship between these variables, 0.50 to 0.99 indicates that redundant relationship and 1 refers that perfect relationship. Table 6 exhibits the association between the variables of social impact

Table 6 Chi-Square Test

| Chi-Square Tests | | | |
|------------------------------|---------------------|----|-----------------------------------|
| Particulars | Value | df | Asymptotic Significance (2-sided) |
| Pearson Chi-Square | 32.499 ^a | 40 | .794 |
| Likelihood Ratio | 33.836 | 40 | .743 |
| Linear-by-Linear Association | .016 | 1 | .900 |
| N of Valid Cases | 428 | | |

Source: Primary data

Table 7 Symmetric Measures

| Symmetric Measures | | | |
|--------------------|------------|-------|--------------------------|
| Particulars | | Value | Approximate Significance |
| Nominal by Nominal | Phi | .276 | .794 |
| | Cramer's V | .138 | .794 |
| N of Valid Cases | | 428 | |

Source: Primary Data

Table 6 and 7 represent the chi-square test values. The Cramer’s V value is 0.138 which means there is moderate relationship between the individual and family social impact and community and institutional social impact by the respondents.

V. CONCLUSION

The landslides due to floods resulted into widespread damage to crops and livestock, and severely affected houses, roads, bridges, schools, hospitals, power lines and other infrastructure. The disaster crippled lives and livelihoods of people. The task before the Government of Kerala was to ensure that the recovery process was handled efficiently, so that people could get back to their normal lives with ease and dignity. It is suggested that a traditional approach to recovery and reconstruction would be insufficient to recover from the floods in a resilient and sustainable manner. The State had to address the fundamental drivers of floods as well as prepare better for future disasters. This could have been performed through the

development of an inclusive and comprehensive roadmap for a green and resilient Kerala.

Disasters have much in common besides the devastation of lives and property they leave behind. They all teach hard lessons, whether the destruction comes from floods, fires, earthquakes, cyclones or other events. These valuable lessons are imperative to be implemented in the present in order to reduce risk and build resilience of the communities for future extreme events. It is said that a chain is as strong as its weakest link. With every disaster, the weakest point of the management gets exposed. The Flood of 2018 in Kerala also pointed out to the vulnerability and weaknesses of the state to hazards and disasters. The lack of preparedness and fatality of the flood made it highly challenging for the state to cope up. The flood brought attention to a number of structural constraints that left Kerala unprepared for major disasters or climate change shocks. This involved inadequate policies and institutional frameworks to control critical natural resources such as water and land, the lack of risk-



proof spatial and sectoral planning policies and frameworks that drove to extensive urban turmoil, uncontrolled construction in hazard prone areas, absence of disaster risk preparedness in key socioeconomic sectors, lack of basic infrastructure in urban areas along with aging and poorly maintained infrastructure, poor capacity of institutions to anticipate and respond to extreme events, and limited fiscal resources as well as absence of pre financing modalities for risk pooling and sharing.

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