

Social Vulnerability and resilience Building: A Study on the flood of 2018 at Vandiperiyar, Kerala

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Abstract

Natural disasters are always causing casualties and economic loss. The flood august 2018 in Kerala was also one such event which has caused huge loss of property and life. The heavy rainfall occurred and within short span of time caused the heavy devastation across the state. This event is considered as one of the most catastrophic events in the history of the State. When addressing the affected population it brings about the realisation of some facts which exist in the society or the social drivers like caste, economic status, age, gender, occupation type, distance from the water body etc. which decisively influence the type of victims.

The present study addresses the role of social characteristics in the flood of 2018 August. In every society there exists some vulnerable groups, they have to be identified and resilience building plans need to be introduced to develop a more sustainable disaster less society.

Keywords: Natural disasters. Floods, Social vulnerability, Resilience, Caste.

Introduction

The August flood is considered to be one of the most catastrophic events in the history of the State. The rainfall data shows that except Kasaragod district, all other districts have got rainfall at normal level and much more. Vandiperiyar grama panchayat is located in the south eastern part of Idukki district just immediate to the Mullaperiyar dam, which was heavily affected by the flood. The floods cause physical damages to agricultural crops, buildings and other infrastructure, social disruptions in vulnerable groups, livelihoods and local institutions and direct and indirect economic losses.¹ When addressing the characteristics of the flood victims, it unveils some different portrait.

A visit in the area makes it clear that affected people are living very immediate to the river most often less than 20 metres from the river. The present study attempts to trace out the social characteristics of flood victims based on a sample survey among selected samples. The affected set of people often possesses similarities as well as disparities in their social composition and other characteristics. The economic level of the people makes capable of recovering from the adversities of the disasters. The economically stable population recovers and the economically unstable faces difficulties in recovering their normal life.

But there are people who suffer very much when compared to others to achieve their recovery from the effects of the disasters. Such groups may be considered as social vulnerable groups. Social vulnerability to natural hazards is most commonly defined as “the differential capacity of groups and individuals to deal with hazards, based on their positions within physical and social worlds”⁵, or as “the inability to take effective measures to insure against losses”.²

Cutter, Boruff and Shirley⁴ identified different aspects of social vulnerability like Socioeconomic status, Gender, Race and ethnicity, Age, Commercial and industrial development, Employment loss, Rural/urban, Residential property, Infrastructure and lifelines, Renters, Occupation, Family structure, Education, Population growth, Medical services, Social dependence, Special needs of population etc.

Adaptive capacity and sensitivity are not the only factors affecting how vulnerable a person will be to a certain exposure. A person's (or system's) resilience will also make him/her more or less vulnerable to the exposure.¹⁹ Resilience is the capacity of a community to adapt to changes in a hazardous area by modifying itself to achieve an acceptable structural and functional level.⁷

In 2007, the fourth assessment report of the IPCC defined resilience as ‘the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation and the capacity to adapt naturally to stress and change’.¹⁴ This capacity to adapt with the disaster related situations is dependent on many factors. Here the social vulnerability can be considered as the opposite side of resilience. So it demands the building up of resilience towards managing the disasters especially among the socially vulnerable groups. So the disaster management plan should be in accordance with the resilience building among the vulnerable groups.

Materials and Methods

The selected area for the present study is Vandiperiyar grama panchayat of Idukki district, Kerala. The area is located in the south eastern part of the district with an elevation not less than 1000 metres. The area is located just after the age old Mullaperiyar dam and the Periyar River passes through the centre of the panchayat. The area was heavily affected by the great flood of 2018.

The study is based on direct field survey in the area and the data is collected from the selected samples. The purposive sampling method is adopted to choose the respondents. The collected data is analysed using statistical packages and the

maps are generated using GIS to support this. The broader objective of the study is to analyse the social dimension of a natural disaster.

Selected parameters of social vulnerability are identified in the study area and are being statistically tabulated and interpreted to unveil existing condition of social vulnerability among the respondents. They include the cast and community back ground, income profile, type of occupation, house maintenance status, agricultural insurance and distance from the water body.

Flood in Vandiperiyar: An over view

The book "Above the heron's pool: a short history of the Peermade/Vandiperiyar district of Travancore" explains in detail about the development of small townships of Vandiperiyar and Peerumade on the way from Mundakkayam to Kumily. Vandiperiyar is a significant place where Periyar river is crossing the National High Way. Locally it is said that in the earlier days, bullock carts (vandi) from Tamilnadu to Kerala came this way and stopped near Periyar river. So the place where vandi (carts) reach Periyar River is named as Vandiperiyar.

There are many different stories about the nomenclature. The place is endowed with picture spots, serene hill tops and valleys, vast tea gardens and a cool climate. The flood of August 2018 had hit almost very parts of Kerala state. A severe spell of rainfall was experienced at several places on the 8th and 9th of August 2018. The 1- day rainfall of 398 mm, 305 mm, 255 mm, 254 mm, 211 mm and 214 mm were recorded at Nilambur in Malappuram district, Mananthavadi in Wayanad district, Peermade, Munnar KSEB and Myladumparain in Idukki district and Palakkad in Palakkad district respectively on 9 August 2018 (CWC 2018). The floods have caused huge loss of life and property in the state.

Vandiperiyar, located on the banks of river Periyar, was also heavily affected by the flood. Unexpected dam operations and heavy rainfall during those days accelerated the rate of devastation in the area. People who are living on the banks of the river lost their houses and other belongings including their pets, animals and agriculture. The area has a long colonial history of plantation, agriculture and migrant labourers. The Travancore Rajas laid claim of all timber grown in the Cardamom hills as it became an important source of revenue.

Between 1817 and 1820, the whole of Kerala was surveyed on Natural Resources and Land patterns by Lieutenants Ward and Cannore companies (George T). The commercial cultivation of tea coffee and pepper cardamom started during the British period which is still in practice.

The British men have constructed road and bridges which connected both the sides of the river Periyar. A dam was constructed to control the floods in Periyar as well as to supply water to the dry cultivable land of present day

Tamilnadu. The area has a mixed Tamil and Kerala culture speaking both Tamil as well as Malayalam. When British men started plantation agriculture, the labourers were brought from Tamil Nadu who are still the residents of this area. Vandiperiyar is a small township in the panchayat. The settlements are distributed along the roads and river and in the plantation estates. Agriculture, especially plantation agriculture is the major land use type here dominantly tea, coffee, cardamom and pepper. There have been floods here in many years, 1924, 1961, 2018 and 2019.

Identifying the vulnerable population: In every society there are different categories of people with vulnerability. But to generalise, there are some sectors of society who are always vulnerable, rather they are living in the vulnerable conditions. Here it lashed out everything that they had in the flood. Mostly they are economically and socially backward classes of the society. This backwardness makes it difficult to recover from the effects of the floods. There are several programmes and policies which aim at betterment of these groups of people.

To address the social dimension of flood victims, the data is collected from 30 samples selected from the most affected wards of the panchayat. They were interviewed using questionnaires to collect their responses regarding their experiences of flood. To realise the role of society in deciding the affected population, the factors like the background, income status are considered. Here the study employs the parameters of vulnerability like caste, income profile, type of occupation, agricultural insurance and distance from the river to assess the level of their vulnerability towards a disaster.

Caste and Community

The caste category is a major deciding factor of social status in Indian society. The Indian Caste System is considered a closed system of stratification which means that a person's social status is obligated to which caste they were born into. There are limits on interaction and behaviour with people from another social status.²⁴

Risley defines it as "a collection of families or groups of families bearing a common name; claiming a common descent from a mythical ancestor, human or divine; professing to follow the same hereditary calling and regarded by those who are competent to give an opinion as forming a single homogeneous community".¹³ It can also be defined as an endogamous and hereditary subdivision of an ethnic unit occupying a position of superior or inferior rank of social esteem in comparison with other such subdivisions.²⁹ When cross checking the 30 samples in the study, they are belonging to the backward classes and the scheduled caste. The share of general category is only 17%. Scheduled caste is 20%, other backward castes 60% and other eligible castes are 3%. So here it can be understood that the people belonging to the backward classes are affected most by the disaster.

Further in depth research unveils that the location of houses and its types and the level of reconstruction and the maintenance from the flood bring further clarity in this regard. They are living very closer to the river, most often in the river beds where there is no water for long, but when it flooded, it devastated their homes. This location makes them more vulnerable to these disasters.

The example of a respondent Muthuthevar who is living very much in the mud flats of the river is heavily affected, whose house is totally destroyed. But still, there are some cases where they are living away from the river, but are affected. To summarise, there exist some stratifications that happen in the society which make some people more vulnerable to disasters. More or less, there are some variations in the category of people who are being victimised. The social vulnerability profile varies in accordance with many factors including caste, economic status and other factors.

Income profile: The economic status adds to people's vulnerability and resilience. A better economic status will help the flood victims for their easy recovery and resilience

whereas people with low economic status find it quite difficult to cover up their losses and to return to a normal life. Every phase of recovery adds burdens to their life. The loss of agriculture, machinery, damage to house and household items and vehicles needs economic stability to bring it back to the normal situation. Finding other sources of funds like banks, money lenders is the solution to this problem. But in a later stage with the daily wage, one often fails to meet his needs and these repayments together. This adds to his further economic liability.

The days of joblessness, life in the rescue camps, health related issues, the reconstruction and maintenance activities all together make the situation worse. To summarise, the economic status is another important factor which decisively acts on how different people are becoming vulnerable to different disasters. From the survey conducted in the area, it can be seen that the annual income is less than 25000 per year for 93% of the respondents. Only 4% belong to the income category between Rs.25000 – 50000. The remaining 3% have an income more than Rs.50000 per year.

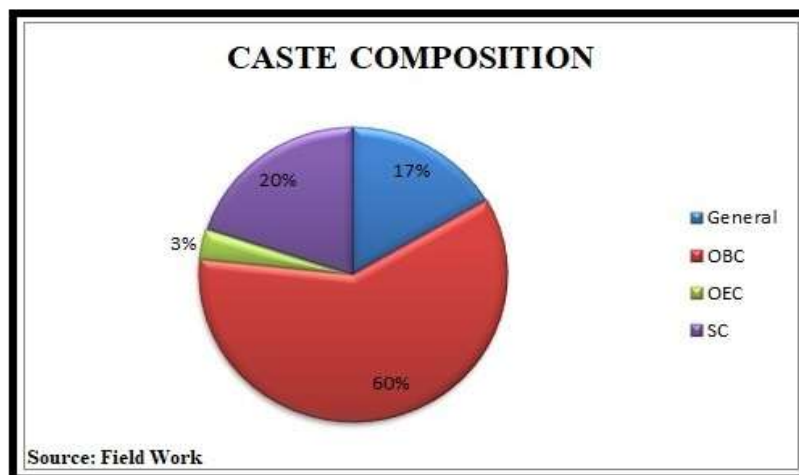


Fig. 1: Caste Composition

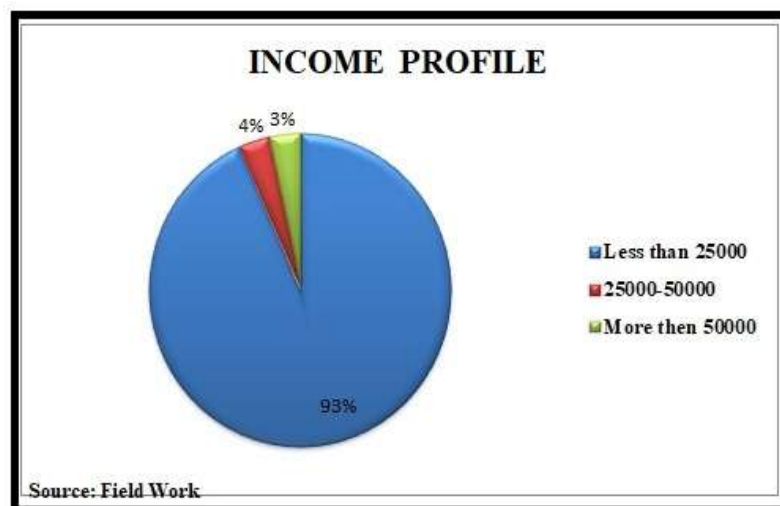


Fig. 2: Income profile

Type of occupation: The occupational type is another factor which decides the life and economy of the people. A person with a regular income will have a stable economic status than that of a daily wage labourer. In the present study, majority of the respondents are engaged in daily wage or low income type of activities. The days of joblessness in between make the situation worse. The availability of loans and other sources also depended on the income status. In the present study, 47% are working in the unorganised sector with very low income (It is mentioned as others which includes driver, electrician and fisherman). 30% are engaged as coolie, which is also an occupation without any consistent income. 13% are working as plantation estate staff. 7% of the respondents are merchants. Only 3% are in government sector. In short, most of the flood victims are engaged in occupation without a stable income which adds difficulty in rebuilding their life after the disaster.

To understand this, the house maintenance status after the flood can be checked. 40% of the respondents have completed the house renovation activities after the disaster. 53% have left without any maintenance because of their

economic hurdles. 7% of them have partially completed their works and still left. They are the people with unstable occupation and unstable income.

Agriculture and crop insurance: From the survey conducted in the area, it is seen that 50 % of them have practiced agriculture before the flood. The items cultivated are mainly tapioca, pepper, cardamom and banana. The panchayat has a well-developed agricultural infrastructure. Further enquiry shows that they are having subsistence type of agriculture in the smaller patches of land in their households. Even though it is a micro level of agriculture, in some cases it adds some share to their income. But it is not a regular and systematically practiced cultivation and so they are not ready to pay for the insurance and other securities. But when it flooded, they lost all they had. But the large scale cultivators had their agricultural insurance which helps them to recover from the economic losses after the flood. Some of the respondents say they have only a smaller area of land to cultivate; it is difficult to find money to invest on the agriculture.

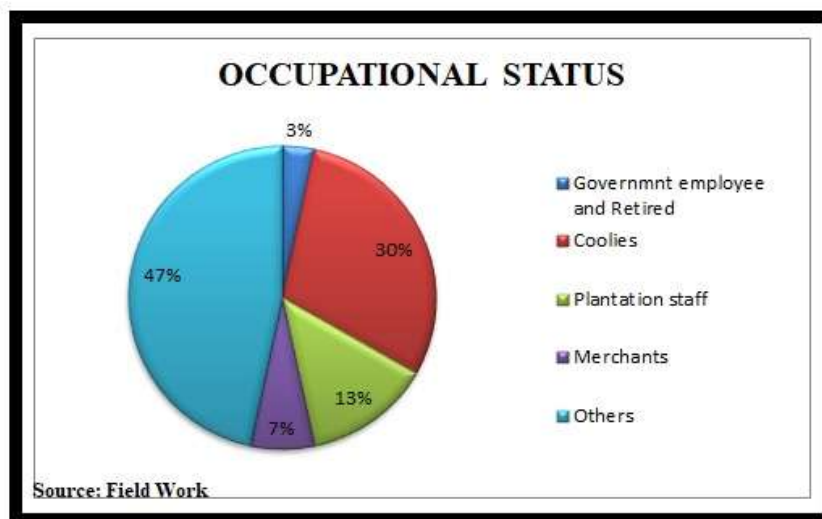


Fig. 3: Occupational status

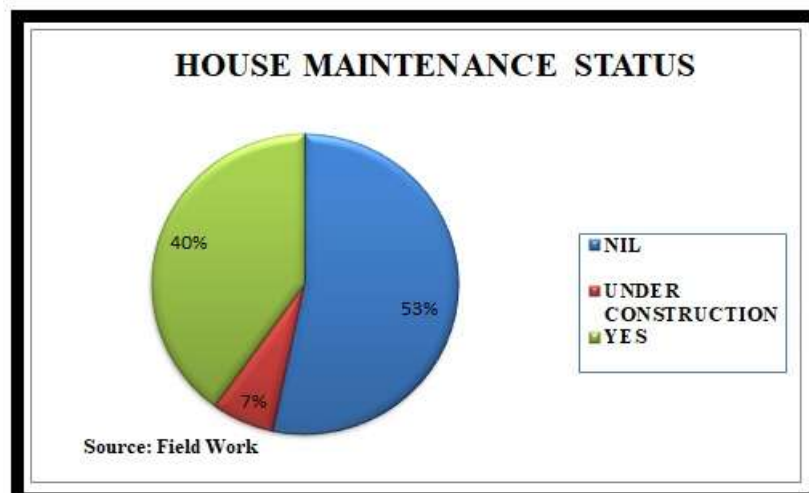


Fig. 4: House Maintenance Status

So it is still harder to pay for insurance and spend time to engage with this. The people even lost their cows, goats and chicken which provided some additional income by selling milk and eggs. This was also lost, no repayments were availed in the absence of any insurance. So here it is clear that the crop insurance depended on the extent and type of agriculture they are engaged in and the capacity of the people to pay it for. But from the respondents, 3 % have insurance protection for their crops and they lost their total cultivation and remaining 97% do not have any agricultural insurance. Hence the absence of crop insurance also added their vulnerability to a disaster.

Distance from the river: When considering the distance from the river, 77% of the respondents are living at a distance less than 20 meters from the river. They are living

with the river for all their daily life. It adds their risk of being affected by the flood water with higher intensity. 10% of them are at a distance between 20-50 meters from the water body, they are also in the risk zone but not as risky as the others.

The remaining 13% are living at distance more than 50 meters, which is comparatively a safer zone, but the heavy floods which occurred in 2018 have affected their houses which were more than 50 meters apart from the water body. It adds exposure to be more vulnerable to a flood situation. But they find it difficult to have a safer place away from the river mainly because of their financial problems and difficulty in availing financial assistance from other sources to purchase a safer and better land holding to build a safe house.

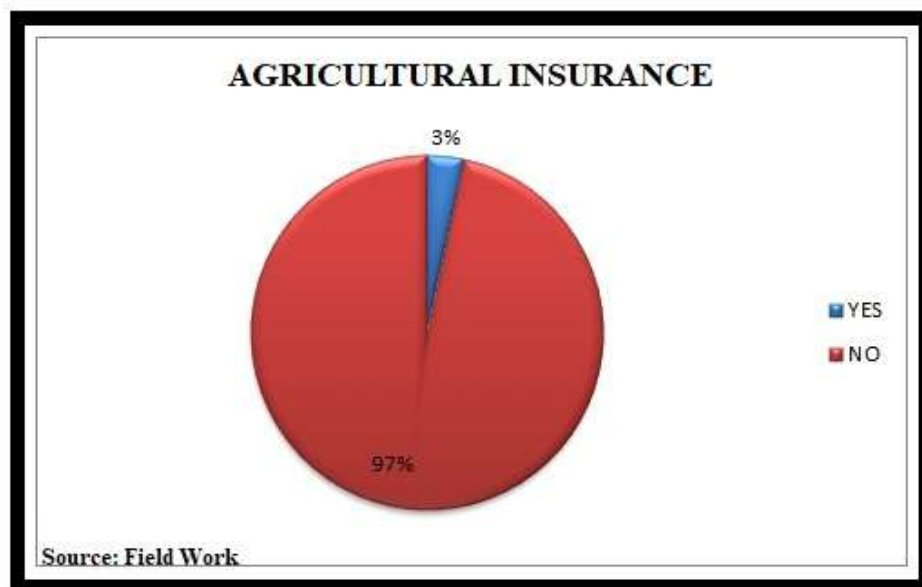


Fig. 5: Agricultural insurance

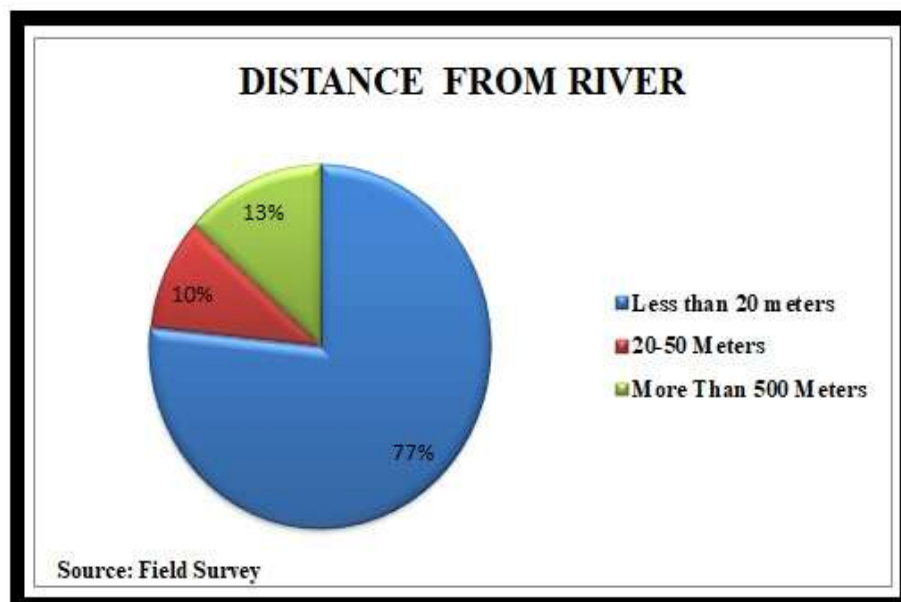


Fig. 6: Distnace from River

Results and Discussion

The study is attempting to disclose how some particular sectors of the society are being exposed as the victims of disasters. The study identifies the aspects of caste, income profile, type of occupation, agricultural insurance, status of house maintenance after flood and distance from the river to show the level of social vulnerability. These people are suffering to adapt to the changes brought by the disaster. Most of them belong to backward classes. There exists a social stratification of the people based on the caste in Indian Society. The basis and essence of social stratification are construed by an unequal distribution of rights and privileges, duties and responsibilities, social values and privation, social power and influences among the members of society.²⁷

Further cross checking the income profile of the people in the area, it is understood that most of them are having an income level below Rs.25000/year. This indicates their economic level and their level of capability to manage the adverse situations like disasters. In our society there exists clear stratification of people based on caste and occupational and economic status. "Each caste had a specific place in the hierarchy of social status." Although in "scriptural terms" social and economic status was supposed to be separated, the economic and social status of the various castes tended to coincide²⁵. So this income level adds their vulnerability towards a disaster.

Type of occupation is another parameter taken into consideration for unveiling the level of vulnerability. 47% belong to the category which include the people who are working in the unorganised sectors and do not have a consistent income to cope up with the changes brought by the flood. The disaster has also damaged the machinery and other equipments of these people which also add hurdles to their income. The status of the house maintenance is clear indicator of the resilience and rebuilding capacity. More than 50% have left their home without any maintenance because of their economic issues. A few are still under construction.

The major issue understood from the survey regarding the reconstruction and maintenance of flood affected houses is that they are unable to find money to spend on this work. Their existing income status and occupation do not allow them to spare their income for other purposes than the daily needs. Here, the assistance from government and other organisations has helped people to rebuild their houses. Some are still left behind. They also face difficulties in availing loans and other economic assistance from banks and money lending agencies because of the lack of a stable income.

Agricultural insurance is the aspect of social vulnerability. Here, more than 90% do not have any insurance scheme to protect their crops. There are two reasons understood from the survey for this absence of insurance. First reason is that the smaller areal extent of their cultivated land and crops. They are cultivating their crops around their houses in small

patches of land. The second reason is that they are not ready to spend their income for unexpected damages that may happen before the flood because they have never faced a disaster like this before. This lack of insurance for crops added burden to their recovery process after the flood. As stated by Cutter, Boruff and Shirley⁴, socioeconomic status and residential property are the factors of social vulnerability; the people here can be considered as socially vulnerable.

Distance from the river is another aspect discussed towards the vulnerability towards a flood. Here 77% of them are living within distance of 20meters from the water body. This proximity makes highly vulnerable to floods. From the field survey it is identified that there are people living with distance less than 5 meters from the river. Geographical characteristics such as distance or proximity to a hazard have also been shown to be a significant determinant of flood-risk perception.²² There are several reasons behind their long period of stay at the flood plains of the river. But the authorities have to identify the risk of their existence and to adapt measures to safeguard their life and property.

The study of respondents and their parameters of vulnerability show that they are socially vulnerable and are living at geographically vulnerable locations. So this situation needs to be addressed and to bring about measures to build capacity and resilience among the vulnerable groups of the society.

Building up the resilient people: The term resilience is derived from the Latin word 'resiliere,' meaning to jump or bounce back.¹⁶ Building up a resilient population is a fundamental task in disastrous situation. It enables the people to jump over the hurdles without being hit in the upcoming events. Capacity building and resilience development should be the primary focus in disaster management planning. Identification of the vulnerable population should be carried out and the actions plans are to be developed.

At the village level, the employment guarantee schemes can (MGNREGS) ensure the availability of income for all the classes at least for a limited number of days in a year. The women empowerment activities and self-help groups can also help in the rescue operation.

The provision of financial aids for the vulnerable groups to recover from the disaster through Government and other agencies will also help them to enhance their resilience. Here in the study area, there can be number of programmes which can be implemented to build resilience to reduce the hardships in the coming days. The construction of houses should follow flood resilience guidelines so that the risk factor can be reduced. Relevant strategies and adequate measures to ensure and enhance resilience of buildings are required, especially for those properties in areas of high flood risks.³

The experiences with structural flood control interventions gave way to new insights which are combination of structural and non-structural flood hazard mitigation measures depending on the specific local or regional needs.³¹ The development of connectivity and necessary health facilities can reduce the risk of casualties at the time of disasters. Most often the remote villages lack these facilities which cause the rise in the death toll. Evacuation camps and shelters should be designed and constructed for every village to ensure safety of the affected population. The local bodies that are frequently affected by disasters should maintain the disaster rescue funds to be disbursed at the time of emergencies. The trained rescue team is another activity that can be carried out so that the local people themselves can operate rescue activities without any delay.

Some generally applicable means of resilience building and risk reduction in the study are suggested:

- Rehabilitation programmes
 - The vulnerable people should be identified and to be shifted to some other safe locations with economic and legal security.
 - Financial assistance and job guarantee should be given.
 - Flood shelters and community buildings should be constructed.
 - Monetary and physical assistance.
- Structural and non-structural
 - Structural measures are:
 - Clearing the silt and other hindrances to ensure the flow.
 - Deepening and widening of river.
 - Improve the adjacent drainage networks.
 - Reduce flood plain occupancy.
 - Side fencing and other activities in places.
 - Non-structural measures are:
 - Zonal Prioritisation of river side activities.
 - People participated planning and management practices.
- Awareness programmes disaster risk reduction and management.
- Training on emergency health care practices.
- Watersheds are to be considered as a development planning unit.
- Proper means of warning and communication about the upcoming events.
- Building a trained mitigation task force at the village level.
- Preparedness for ensuring self-security and personal belongings.

Conclusion

Natural disasters are common now. Floods cause huge damage to human life and property every year. Even though many people are affected, there are some set of social factors for most affected without any means to recover. These groups are called as vulnerable sections of the society.

The driving factors behind this vulnerability are many including geographical, social economic and many other. But they have to be protected and to be uplifted. Making them capable enough to recover from the effects of the disaster and adapt with the changes happened are important in resilience building. The disaster management plans are to be developed in accordance with the concern for the development of resilience among these vulnerable groups.

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