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# Disaster Vulnerability of Farmers from Flood Damage in District Charsadda

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#### ABSTRACT

This research examines the association between community organization and disaster vulnerability in three flood-affected Village Councils (VCs) in Charsadda district, namely Nawan Killi, Faqir Abad, and Chak Utmanzaie. Using a proportional allocation approach, 353 households were randomly selected from a total of 4,270 in the sampling frame. Data was collected through interviews, with the study's conceptual framework featuring one independent variable (Community organization) and one dependent variable (Disaster vulnerability), both measured on a three-level Likert Scale. The analysis, employing chi-square tests, revealed significant associations. Disaster vulnerability demonstrated a highly significant relationship with community organization during flood seasons (p=0.000), facilitation of social organization by NGOs, democratic election of disaster management committees, representation of all vulnerable groups in committees, and inclusion of various castes and sects in community organizations. Furthermore, disaster vulnerability exhibited a highly significant correlation with decisions made by disaster management committees, incorporating suggestions from vulnerable groups, prioritizing vulnerability groups, informing community members of committee decisions, and having women represented in committees. The study's findings underscore the importance of establishing and updating community participation guidelines for disaster management, ensuring active involvement of all stakeholders in planning and executing disaster management initiatives, promoting awareness and capacity building in participatory disaster management approaches, and fostering partnerships with NGOs, donors, and government agencies to secure financial and technical support.

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## **1. INTRODUCTION**

Disaster refers to any natural or manmade situation which disrupts the normal social functioning of human

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beings in a group or society and exceeds the limits of the locals to tackle the adversities and are vulnerable to the situation is called a disaster (Denis, 1995). Natural, manmade and hybrid disasters are its main three types (Shaluf, 2007). Flood is a common and fatal disaster in which, due to excessive flow of water, those pieces of land submerge in water which are normally dry (Wachinger, et al., 2013). From 1998 to 2017 flash floods, river floods and coastal floods have affected more than two billion people. Lack proper awareness and alarm systems during floods season increases the vulnerability of the people to this natural disaster. Pakistan is among those countries which are severely affected by climate change and one of the most frequent disasters that they frequently face is the flood. The July 2010 and august 2022 floods were the most destructive

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affecting all the parts of the country. Only the 2022 floods had an estimate defect on thirty-three (33) million people nationwide causing around 1739 deaths and affected around 809 thousand hectares of land. These floods caused \$14.9 billion of damage and \$15.2 billion of economic loss (Devi, 2022). Community Based Disaster Risk Management (CBDRM) strategy has recently been introduced in the disaster affected areas of Pakistan to cope the disasters effectively.

## 2. LITERATURE REVIEW

Khyber Pakhtunkhwa province was amongst most affected provinces of Pakistan, with an estimated loss of \$299.3 Million. According to reports, upper and lower Kohistan, Swat, upper and Lower Dir, Dera Ismail Khan, Tank and Charsadda districts were worst affected by the 2022 floods, while Chitral, Mansehra and Swabi districts suffered lower intensity damage due to flood. Out of all sectors, agriculture sector suffered the most in the province with initial survey predicting a loss of around \$61.6 Million, expected to increase as the final estimates are yet to come after the accurate survey to be carried out later. Moreover, according to an estimate 60752 acres of cultivated area was affected by flood causing around 97063 metric tons of crops yield being destroyed, on the other hand around 13228 cattle were killed. Besides that, 2248 watercourses and storage tanks were destroyed which added to the difficulties of the farmers for the upcoming sowing season as their irrigation systems were destroyed in most parts of the province (Manzoor, 2022).

Till recent past there was a common belief that nothing could be done till the onset of disaster, therefore, disaster management was restricted to response and recovery activities only. However, the modern concept of disaster management suggests various mitigation and preparedness activities that can avoid disaster or reduce its negative effects. Community based disaster management activities are a chain of such interrelated activities with the main focus to avoid or reduce the losses due to various disasters. These activities include awareness and training programs on community levels to make the people aware of disasters that they may face, train them to be prepared before the disaster had occurred by using some signs and signals as alarms, responding to the situation in best possible way immediately with all available resources at community level without waiting for external help with the focus of rapid and effective recovery (Emilie, 2013).

concept of community-based disaster risk The management activities originated in 1980s, with the basic frame work of bottom-top approach. The main focus of community-based disaster risk management (CBDRM) was to train the locals of a community, improve their capacity and skills to tackle various disasters and boost their decision-making capacity to prioritize the most vulnerable and treating them during disasters and hazards (Norris et al., 2007). Community based disaster management activities are actually trainings given to local members of community that are vulnerable to various disasters. The main focus of these trainings are risk assessment, preparedness, response and rehabilitation. The (CBDRM) gained huge importance worldwide, due to this program the losses due to various disasters were reduced to a great extent and with some interventions from governments and non-government organizations the community were able to tackle the situations by themselves (Niekerk, 2017).

## Theoretical framework

Disasters and human reaction to disasters have remained an issue of discussion among sociologists since long. Various sociological interpretations and theories are presented to explain disaster management into its various dimensions and perspectives. These theories include Chaos Theory (System Theory), Marxist Theories, Social Constructionist Theories, Weberian Theories, Risk Perception and Communication Theory and Theory of Emergency Management (Dynes & Drabek, 1994).

Chaos or System Theory suggests sequential causes and effects relationships among hazards, risk, disaster, vulnerability and resources. However, these cause and effect relationships, according to theory, are non-linear. Marxist perception further adds to chaos theory by suggesting inequality in disaster vulnerabilities due to socio-economic and political deprivations of different human groups. Social constructionists describe disasters as a socially constructed phenomenon. The vulnerability of the people to the disaster is, therefore, based on their perception of hazards. Weberian perspective further adds that disaster vulnerability is close associate of prevailing culture. Thus, life losses, economic damages and environmental losses are linked to the social norms, values, attitudes and practices prevailing in a culture. Emergency response to disaster, according to this theory, is supported by positive norms and values. Risk perception and communication paradigm suggested that most people are unaware of the potential of disaster that can damage them. They may exaggerate their potential to face disaster and receive great losses. All the above theories are criticized for their inability to suggest remedial measures to avoid disasters or reduce its losses (Bankoff, Frerks & Hilhorst, 2013).

This research study is, therefore, based on theory of emergency management. The emergency management theory, besides identifying disaster risks, vulnerability and its effects, tries to point out the human capacities in terms of resources, strengths and means to cope with disasters. This theory emphasizes on identifying these human potentials and its strengthening to avoid disasters or reduce its effects. Community involvement in disaster risk management is one of the strong arguments of risk management theory to reduce disaster vulnerability (McEntire, et al., 2002).

In summary, until recent past the natural disasters were considered as unpredictable and unavoidable. Later on, the concept of rehabilitation emerged in which governing bodies and non-profitable organizations started to step in and help the affected people. With passage of time, the natural disasters started to occur more frequently and with high intensity causing huge damage than ever before. In those situations, it was very difficult for government agencies and other organizations to provide effective and timely required necessities to the vulnerable people. In late 1980s the concept of community-based disaster management (CBDM) emerged. The main focus of this concept was to enable the locals of different communities which were exposed to various disasters to take such measures to avoid disasters and respond to disasters immediately and protect those which were most vulnerable to the disaster. For this purpose, volunteers from various communities were trained

and capacitated to be prepared for the challenges and respond rapidly and effectively to the disasters, in order to minimize the losses followed by effective measures for timely relief and rehabilitation. Between 1980s and 2000s the CBDM gained huge importance worldwide as it was a very effective way to handle disasters with little help from outside (government and non-government organizations). CBDM is of key importance for Pakistan because of its high vulnerability to negative repercussions of climatic changeslike natural disasters, especially floods, which are now happening almost every year with increasing intensity. The CBDM requires minimum resources and little social organization to tackle disasters.

#### **Research questions**

- What is the extent of the association between community organization and disaster vulnerability in flood-affected Village Councils (VCs) within Charsadda district, Pakistan?
- How does the involvement of NGOs in facilitating social organization impact disaster vulnerability in these flood-affected areas
- What are the implications of democratic elections within disaster management committees for mitigating disaster vulnerability, and how does representation from various vulnerable groups and castes influence these outcomes in the context of community organization?

#### Hypothesis

- The following research hypothesis will be tested using statistical techniques given in the methodology section.
- There is a significant association between community organization and disaster vulnerability in flood-affected VCs within Charsadda district, Pakistan.
- The involvement of NGOs in facilitating social organization significantly reduces disaster vulnerability in flood-affected areas.
- The democratic election of disaster management committees, along with representation from various vulnerable groups and castes, significantly contributes to the mitigation of disaster vulnerability through community organization.

## **3. RESEARCH METHODOLOGY**

The study universe included three Village Councils (VCs) of district Charsadda i.e. Village Councils Nawan killi, Faqir Abad and Chak Utmanzaie. The Village Councils (VCs) selected are located in Tehsil Charsadda. These VCs are amongst the worst hit by August 2022 floods in the country. The total household population of the three selected VCs is 1650, 1080, 1540 respectively. Thus, the sampling frame for this research comprised of 4270 households. The sample size for this study was calculated using Chaudhry (2009) formula (Equation-1)

$$n = \frac{N\hat{p}\hat{q}Z^2}{\hat{p}\hat{q}Z^2 + Ne^2 - e^2}$$
 (Equation-1)

Where, N= total number of households in selected village councils = 4270, p= population proportion=0.50, q= opposite proportion q=(1-p) =0.50, z= confidence level = 1.96, e= margin of error = 0.05, n= 353.

According to the given formula, the required sample size for a population of 4270 is 353. Bowley (1926) has suggested a proportional allocation procedure for the allotment of respondents among different strata of the population frame as given in Equation 2. The same procedure is adopted for the proportional allocation of farmers in different VCs.

Nh= (n / N) \*Ni (Equation-2)

In the above equation, n represents the total sample size, N symbolizes the total household population of all three VCs, Ni stands for the household population of each VC and Nh is the required sample size for each VC. The lottery method of simple random sampling was applied for sample selection from the sampling frame. The allocation of sampled respondents to each VC is given in Table 1.

#### Table 1

Proportional	allocation	of sam	ple to	selected	village	councils
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S. No	Village Council	Household population (N)	Sample size (n)
1	Nawan Killi	1650	136
2	Faqir Abad	1080	89
3	Chak Utmanzai	1540	128
		4270	353

Data collection was carried out through interview schedule. The interview schedule consisted of an independent variable and one dependent variable (Table 2). The variables were measured on three levels Likert Scale. For authentic data collection the face-to-face interview method was adopted and the data was collected by the researcher himself. The interview schedule was pretested before data collection to assess the reliability and validity of data collection tool.

### Table 2

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S. No	Independent variables	Dependent variable
1	Community organization	Disaster vulnerability

Data was analysed using uni and bi-variate analysis techniques. Univariate analysis of data involved descriptive statistics like frequency count and percentage calculations for demographic, background, independent (community organization) and dependent variables (Disaster vulnerability). Percentages are calculated using equation Equation-3.

Data class's percentage = f/N \* 100 ...... (Equation-3)

Where, f = Data class's frequency N = total observations.

One of the research objectives of this study is to find the association between the independent variable (community organization) with the dependent variable (Disaster vulnerability). The chi-square test, a non-parametric test of association among variables, was applied at the bi-variate level to ascertain the association among these study variables. Chi-square values are calculated by using following formula (Equation 3; Tai, 1978).

$$\chi^{2} = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{ij} - e_{ij})^{2}}{e_{ij}}$$
 (Equation-3)

x2=Chi-Square

Oil= Observed frequencies in the ithrow and jthcolumn eij=Expected frequencies regarding ith row and jth column r=Number of rows c=Number of columns Df =(r-1) (c-1)

The chi-square test requires the following conditions to be fulfilled:

Initially, the research subjects are independently and randomly selected.

Each observation must qualify for one and only one category.

There must be sufficiently large sample size so that each cell should not have expected frequency below 5, for row "r" and column "c">2 or < 10 if row = column = 2.

In most research studies having multi-level response questions for data collection, the third condition of the chisquare test is violated. In such situation an extension of the chi-square test, termed as the Fisher Exact Test (Equation-4) is applied, as below.

## 4. RESULTS & FINDINGS

## **Community Organization**

In the context of disaster management activities there are two main approaches towards disaster management i.e., top-bottom approach in which the government organizations take the lead and respond to various disasters, and a bottom-up approach, in which the locals of an area that are prone to various disasters are provided with adequate training and resources so that they can respond to emergency situation in time and can give policy input to the administration. In bottom-up approach the first step to follow is community organization. In this step the community members representing various groups are organized in one unit at village level to plan and implement disaster management interventions. The perception of respondents towards community organization was determined on the basis of some question asked from them during the interview, the results of which are as under in table 4.

As per the results of table 4.16, almost half (50.7%) respondents informed that their community was not organized during flooding season, similarly, 54.4% of respondents stated that their community was facilitated by government agencies during floods, majority respondents (60.9%) were of the view that their community was facilitated by non-government organizations during floods. Under participatory approaches the communities are organized by the disaster management organizations at community level by extending technical and financial support. In the study area the communities have started adopting this bottom-up approach. However, still top-bottom approach is predominant, where government and NGOs take lead role, instead of community organization, for taking mitigative actions. In order to achieve much better-results and reduce disaster vulnerability to a significantly lower level it is necessary to adopt the community-based disaster management activities model also called participatory approach. This approach enables community to take lead in planning and implementing mitigation measures and respond to flood disaster in time. Samir (2013) stated that the community-based disaster management model is more effective and economical than conventional disaster response measures adopted by government and nongovernment organizations. However, its diffusion at community level is much slow.

Furthermore, 51.3% respondents were of the view that their disaster management committee members were nondemocratically elected, in addition, 58.6% responded that the disaster management committee had unequal representation of all vulnerable groups, most respondents (77.3%) had the view that their village level disaster management committee had no women representation, while 73.1% denied the representation of individuals of every cast and sect in the disaster management committee. A community-based disaster management activity is actually a team work to touch the problems of all social groups within community and get maximum positive results benefitting all the members of the community. For this purpose, all socioeconomic groups need to be organized at village level by ensuring their representation in village organization and involved in disaster planning and implementation activities. As member's different socio-economic groups have different problems, needs and capabilities, therefore, if all members of a community have equal participation in the disaster management activities, the results will be more promising and beneficial to all social groups. Ignoring any social group during social organization not only reduces the sense of community ownership in disaster management but such neglected group may obstruct such developmental actions. Label, et al. (2011) found that with time the vulnerability of individuals in Thailand towards floods have been changing due to formal and informal institutions helping them out in shaping exposure. The best solution of all those efforts was the enabling of locals to participate in the disaster risk management and launching of rescue operations.

The results further show that 58.6% respondents were of the view that the decision taken by disaster management committee to tackle floods do not involve the suggestion of vulnerable groups. Besides that, most respondents (58.9%) had the opinion that the decisions taken by disaster management committee to tackle floods were not based on prioritization of vulnerable groups. While more than half of respondents (52.7%) thought that the community members were not informed of the decisions taken by the disaster management committee. Ideally, the disaster planning and implementation involves active participation of disaster management committees established at village level for identification of issues, their prioritization taking decisions and publicizing such decisions. In this way a consensual plan is prepared to respond to disaster in time and rescue the vulnerable members of the community to reduce human, financial and environmental losses effectively. Decisions taken in isolation may not fit to the needs and priorities of the vulnerable groups and result into failure of achieving the desired disaster management goals. Joseph, et al. (2020) also stated that the best way to handle floods is by empowering the vulnerable people of the community to take mitigation measures and respond to disasters in time. A well-organized disaster management committee is characterized with representation and active participation of all stake holders in disaster planning and implementation process. Moreover, the outcomes of such disaster planerites are well publicized in the relevant communities.

Table 4

Perception of the respondents towards community organization

Attributes	Yes	No	Uncertain	Total
Your community is organized during flooding season.	174 (49.3)	179 (50.7)	0 (0%)	353(100)
Your community is facilitated by government agencies to organize during floods.	192 (54.4)	161 (45.6)	0 (0%)	353(100)
Your community is facilitated by non-government agencies to organize during floods.	215 (60.9)	138 (39.1)	0 (0%)	353(100)
Your disaster management committee members are democratically elected.	172 (48.7)	181 (51.3)	0 (0%)	353(100)
Your disaster management committees have the equal representation of all vulnerable groups	142 (40.2)	207 (58.6)	4 (1.1)	353(100)
Your disaster management committees have women representation.	80 (22.7)	273 (77.3)	0 (0%)	353(100)
The disaster management committees have representation of every cast and sect from the community	95 (26.9)	258 (73.1)	0 (0%)	353(100)
The decisions taken by disaster management committee to tackle floods involve the suggestions of vulnerable groups	146 (41.4)	207 (58.6)	0 (0%)	353(100)
The decisions taken by disaster management committees to tackle floods are based on prioritization of vulnerability groups	145 (41.1)	208 (58.9)	0 (0%)	353(100)
The community members are informed of the decisions of disaster management committee	162 (45.9)	186 (52.7)	5 (1.4)	353(100)

Source: survey 2023

Community organization in the targeted communities was initiated to some extent, however, such organization was not optimal. Representation and participation of all stake holders in disaster planning was not up to the mark, consequently, the problem identification, their prioritization and suggested solutions were designed with little community consultation and its insufficient publicizing.

#### **Disaster Vulnerability**

Disaster vulnerability is the extent to which an individual or community is exposed to the negative effect of a natural disaster. Distance from the source of disaster, socioeconomic standing and inability to timely evacuate from disaster area are the important indicators of disaster vulnerability. Perception of the respondents on disaster vulnerability are given in Table 5. According to the results 50.7% respondents were of the view that their place of residence was at safe distance from river to avoid floods, 59.8% respondents place of residence was not at a safe distance from river so that they could have enough time to evacuate during floods, 68.6% respondents had access to alarm system to get informed of upcoming floods in time. Majority respondents, due to their proximity to river were quite vulnerable to floods. UN awareness and inaccessibility to flood alarm system further added to their vulnerability. Comparatively, people living at safe distance from river and having better and timely information of flood alarm were less vulnerable to floods. Younis et al. (2008) emphasized on significance of high-resolution images and modern technologies for flood alarm system. The authors added that in case of flooding in low land the vulnerability of individuals

#### Table 5

Perception of the respondents towards disaster vulnerability

would depend upon their area of living's vicinity from river and source of alarm so that they can be informed of upcoming floods in time. If an individual's area of living is in safe distance from river, have an authentic source of alarming and can respond to those alarms, its vulnerability will be reduced.

Moreover, 66.6% respondents lacked sufficient equipment to withstand flood hazards, 56.7% respondents were not financially strong enough to tackle the negative effects of floods, 76.2% respondents were physically strong enough to evacuate during floods, 52.7% respondents had no linkages with various organizations to get aid during floods and 70.3% respondents had the capacity to rescue the vulnerable members of their family or village during floods. The results show that due to close vicinity with rivers, lack of equipment to tackle floods and financial instability those people of the study area were vulnerable to flood damages. Besides that, they mostly had little linkages established with any organization to get aid during floods which adds to their vulnerability. Doocy, et al., (2013) highlighted that the floods are the most common type of natural disaster that have been affecting mankind. Despite various mitigation measures the flood losses are continuously increasing. After 1980s the losses due to these floods were effectively reduced with the implementation of community-based disaster management model. The geographical locality, low awareness and low socioeconomic status were the important reasons of disaster vulnerability in the community members. However, the strong culture of mutual help and support to people in problem were important ingredients to build community-based disaster management strategies.

Attribute		No	Total
The place of your residence is at safe distance from river to avoid floods	179(50.7)	174(49.3)	353(100)
The place of your residence is in safe distance from river to have enough time to evacuate during floods	142(40.2)	211(59.8)	353(100)
You have access to any alarming system to get informed of upcoming floods in time	242(68.6)	111(31.4)	353(100)
You have sufficient equipment to withstand flood hazards		235(66.6)	353(100)
You are financially strong enough to tackle the negative effects of floods	153(43.3)	200(56.7)	353(100)
You are physically strong enough to evacuate during floods	269(76.2)	84(23.8)	353(100)
You have the linkages established with various organizations to get aid during floods		186(52.7)	353(100)
You have the capacity to rescue the vulnerable members of your family/ village during floods	248(70.3)	105(29.7)	353(100)

Source: survey 2023

# Association between Community Organization and Disaster Vulnerability

Till 1980's with the increase in interval and intensity of natural disasters, the approach lead by local governments to tackle the situation was not enough to rescue and support the vulnerable people. Thus, the concept of communitybased disaster management emerged with the main focus to train and support the local members of communities, so that they can timely respond to various disasters and help the vulnerable members to reduce life, economic and environmental losses. The first step towards the communitybased disaster management is to organize the community, get informed of their strengths and weaknesses, know about their available resources and identify the vulnerable groups. Association of community organization and disaster vulnerability was tested by cross tabulating questions on community organization with disaster vulnerability, as given in Table 6.

Results in table 4.21 show that disaster vulnerability exhibited a highly significant association with community organized during flood season (p=0.000), facilitation in social organization of community during flood by NGOs (p=0.000), democratic election of disaster management committee members (p=0.000), representation of all vulnerable groups in disaster management committee (p=0.000), and representation of every cast and sect of the community in community organization (p=0.000). Moreover, association of disaster vulnerability and women representation in disaster management committee was significant (p=0.012). Social organization refers to organizing community members for collective efforts to achieve common cause. The communities could be informally organized by internal efforts of community members without any outside support or formally through government or NGO interventions. Communities are generally organized through a democratic electoral process with representation from all vulnerable groups including women. Following these procedures enhances the legitimacy and strength of the community organizations for disaster management and reduces their disaster vulnerability, as evident from the above significant results. Lebel et al. (2011) and Kc (2013) elaborated the process of community organization for disaster management. An efficient community organization, according to authors, requires the democratic election of community representatives from all sect and groups. Missing vulnerable groups, like poor, women and religious minorities etc., in community organization enhances their disaster vulnerability.

#### Table 6

Association between Community organization and Disaster vulnerability

		Disaster Vulnerability			Chi- Square
Community organization	Perception -	Low vulnerability	High vulnerability	Total -	(P-Value)
Verse second to be second down the discover	Agree	118 (67.8%)	56 (32.2%)	174 (100%)	χ2= 87.894
Your community is organized during flooding season	Disagree	33 (18.4%)	146 (81.6%)	179 (100%)	(p=0.000)
	Agree	90 (46.9%)	102 (53.1%)	192 (100%)	χ2= 2.889
Your community is lacilitated by government agencies to organize during floods.	Disagree	61 (37.9%)	100 (62.1%)	161 (100%)	(p=0.089)
	Agree	115 (53.5%)	100 (46.5%)	215 (100%)	χ2= 25.782
Four community is facilitated by non-government agencies to organize during floods.	Disagree	36 (26.1%)	102 (73.9%)	138 (100%)	(p=0.000)
Vous disaster management committee members are demonstically elected	Agree	100 (58.1%)	72 (41.9%)	172 (100%)	χ2= 32.346
four disaster management committee members are democratically elected.	Disagree	51 (28.2%)	130 (71.8%)	181 (100%)	(p=0.000)
	Agree	89 (62.7%)	53 (37.3%)	142 (100%)	χ2= 46.739
Your disaster management committee have equal representation of all vulnerable groups	Disagree	58 (28%)	149 (72%)	207 (100%)	(p=0.000)
0	Uncertain	4 (100%)	0 (0%)	4 (100%)	
	Agree	44 (55%)	36 (45%)	80 (100%)	χ2= 6.314
Your disaster management committees have women representation.	Disagree	107 (39.2%)	166 (60.8%)	273 (100%)	(p=0.012)
The disaster management committees have representation of every cast and sect from	Agree	62 (65.3%)	33 (34.7%)	95 (100%)	χ2= 26.851
the community	Disagree	89 (34.5%)	169 (65.5%)	258 (100%)	(p=0.000)
The decisions taken by disaster management committee to tackle floods involve the	Agree	98 (67.1%)	48 (32.9%)	146 (100%)	χ2= 60.294
suggestions of vulnerable groups	Disagree	53 (25.6%)	154 (74.4%)	207 (100%)	(p=0.000)
The decisions taken by disaster management committees to tackle floods are based on	Agree	93 (64.1%)	52 (35.9%)	145 (100%)	χ2= 45.875
prioritization of vulnerability groups	Disagree	58 (27.9%)	150 (72.1%)	208 (100%)	(p=0.000)
The community members are informed of the decisions of disaster management	Agree	100 (61.7%)	62 (38.3%)	162 (100%)	χ2= 55.203
committee	Disagree	46 (24.7%)	140 (75.3%)	186 (100%)	(p=0.000)
Source: survey 2023					

The results further show that disaster vulnerability had a significant association with decisions taken by disaster management committee to tackle floods involve the suggestions of vulnerable groups (p=0.000), decisions taken

by disaster management committees to tackle floods are based on prioritization of vulnerability groups (p=0.000), and community members are informed of the decisions of disaster management committee (p=0.000). The community organization at village level is a lead organization to take disaster related decisions through mutual consensus and its among dissemination community members. Α democratically elected community organization with representation from all community members is in better position to involve all stake holders in problem identification, planning, and implementation related decisions. The decisions of such committee are owned by all community members and better implemented to d=reduce disaster vulnerability. Conversely, non-representation or non-involvement of powerless and minority groups in community organization and decision-making process may create the sense of deprivation among marginalized group and enhance their vulnerability to disasters (Label, et al., 2011).

Conversely, the association of disaster vulnerability was non-significant with facilitation from government agencies in community organization.

Community organization is starting point for communitybased disaster management. Those community members who faced fair treatment in community organization and decision-making process were more apt to avoid flood disaster or reduce its damages compared to those who felt that they were ignored in community organization process.

## 5. CONCLUSIONS & RECOMMENDATIONS

Community organization is the key feature of communitybased disaster risk management. However, the community organization lacked in the democratic process of electing community representatives for disaster management with representation from all ethnic and marginalized groups including female representation. Consequently, the decisions for flood management lacked the participation and views of marginalized groups. The priorities of marginalized groups were, therefore, over sighted to such an extent that, in some extreme cases these weak groups were not even informed of the decisions taken by the disaster management committees.

In light of above findings the study made the following recommendations.

- Devising such community participation rules and procedures that ensure employment of democratic procedures and principles for election of community organization with representation from all socio-economic, ethnic, religious and gender group
- Ensuring participation of all social groups in problems identification, prioritization, remedial measures and implementation in such a manner that no one is left behind.
- Capacity building of community members in the basics of community organization, disaster awareness, vulnerability analysis, disaster planning and implementation, identification of safe spots and evacuation routs, devising time bound evacuation plans, use of modern tools, equipment and mobile applications for disaster prediction, and seeking help while using these mobile applications.
- Community mobilization and their linkages development with other agencies for arranging finances for flood response from their own sources or other donors to be spent on planning and implementation of relevant interventions like arranging food and medicine reserves and its storage at safe spots, appropriate transport system like boats etc. to be used during flood evacuation etc.

#### **Competing Interests**

The authors did not declare any competing interest.

#### References

- Bankoff, G., Frerks, G., & Hilhorst, D. (Eds.) (2013). Mapping Vulnerability:" Disasters, Development and People". https://doi.org/10.4324/9781849771924
- Bowley, A. L. (1926). The influence on the precision of index-numbers of correlation between the prices of commodities. Journal of the Royal Statistical Society, 89(2), 300-319. https://doi.org/10.2307/2341313
- Chaudhry, S.M. 2009. Introduction to statistical theory, 8th edition, Publisher: Lahore, Pakistan: Ilmi Kitab Khana.
- Denis, H. (1995). "Scientists and disaster management", Disaster Prevention and Management, Vol. 4 No. 2, pp. 14-19. https://doi.org/10.1108/09653569510082650
- Devi, S. (2022). Pakistan floods: impact on food security and health systems. The Lancet, 400(10355), 799-800. https://doi.org/10.1016/s0140-6736(22)01732-9
- Doocy, S., Daniels, A., Murray, S., & Kirsch, T. D. (2013). The human impact of floods: a historical review of events 1980-2009 and systematic literature review. PLoS currents, 5. https://doi.org/10.1371/currents.dis.f4deb457904936 b07c09daa98ee8171a
- Dynes, R. R. & Drabek, T. E. (1994). The structure of disaster research: Its policy and disciplinary implications. International Journal of Mass Emergencies & Disasters, 12(1), 5-23. https://doi.org/10.1177/028072709401200101
- Emilie, S. A. (2013). An investigation of stakeholder participation and learning in two schools within the Seychelles.
- Joseph, J. K., Anand, D., Prajeesh, P., Zacharias, A., Varghese, A. G., Pradeepkumar, A. P., & Baiju, K. R. (2020). Community resilience mechanism in an unexpected extreme weather event: An analysis of the Kerala floods of 2018, India. International Journal of Disaster Risk Reduction, 49, 101741. https://doi.org/10.1016/j.ijdrr.2020.101741
- Lebel, L., Manuta, J. B., & Garden, P. (2011). Institutional traps and vulnerability to changes in climate and flood regimes in Thailand. Regional Environmental Change, 11, 45-58. https://doi.org/10.1007/s10113-010-0118-4
- Manzoor, A. 2022. Floods cost Khyber Pakhtunkhwa Rs68 billion. Daily Dawn 2 September 2022.
- McEntire, D. A., Fuller, C., Johnston, C. W. & Weber, R. (2002). A comparison of disaster paradigms: The search for a holistic policy guide. Public administration review, 62(3), 267-281. https://doi.org/10.1111/1540-6210.00178

- Niekerk, D. V., Nemakonde, L. D., Kruger, L., & Forbes-Genade, K. (2018). Community-based disaster risk management. In Handbook of disaster research (pp. 411-429). Springer, Cham. https://doi.org/10.1007/978-3-319-63254-4\_20
- Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2007). Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Disaster Readiness. American Journal of Community Psychology, 41(1-2), 127–150. https://doi.org/10.1007/s10464-007-9156-6
- Samir, KC. (2013). Community vulnerability to floods and landslides in Nepal. Ecology and Society, 18(1).
- Shaluf, I. M. 2007. Disaster types. Disaster Prevention and Management: An International Journal.
- Tai, Simon. W. 1978. Social Science Statistics, its Elements and Applications. California, Goodyear Publishing Company.
- Wachinger, G., Renn, O., Begg, C., & Kuhlicke, C. 2013. The risk perception paradox—implications for governance and communication of natural hazards. Risk analysis, 33(6), 1049-1065. https://doi.org/10.1111/j.1539-6924.2012.01942.x
- Younis, J., Anquetin, S., & Thielen, J. (2008). The benefit of high-resolution operational weather forecasts for flash flood warning. Hydrology and Earth System Sciences, 12(4), 1039-1051. https://doi.org/10.5194/hess-12-1039-2008

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