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# Role of Socio-Economic Resilience in Coping with Flood Vulnerabilities in District Charsadda

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**Abstract** *This quantitative study was conducted in the union council Agra of district Charsadda. Primary information was collected from the sample size of 150 male respondents. A conceptual framework consisting of the independent and dependent variables was cross-tabulated through the application of Chi-Square test statistics to ascertain the association between the two variables. The study revealed a significant association (P≤0.05) of local community response with the statements such as poor families are more vulnerable to flooding; awareness about flood vulnerabilities; economic status reduces flood vulnerability; people buy cheap land for houses; people living on the river bank and side walls reduce flood vulnerabilities. The study recommends that government and local authorities should take responsibility for protecting the lives and properties of the people in flood-vulnerable areas through safety measures and make effective policies to measure the vulnerability and damage caused by floods among low-income families.*

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## Introduction

In 2050, various groups living in flood-prone areas are expected to total 1.3 billion, or 15% of the world's population. This figure represents an increase of 0.3 billion over the current year (Ligtvoet et al., 2014). Flooding is a natural type of disaster, which has been getting more frequent in recent decades. Natural calamities, particularly floods, continue to occur despite significant infrastructural capital invested in preventing their consequences. When the risks associated with riverbank and beach flooding (a significant source of escalating hazards) are combined with high rates of population growth and urbanization, it is obvious how an increased number of places are at flood risk. According to Bakker (2009) of the World Resources Institute, flood disasters harm 21 million people worldwide each year. By 2030, that number will have increased to 54 million, as continued urbanization, population increase, inadequate maintenance of flood-control infrastructures, and climate variability all contribute to an increase and vulnerability of the population.

A flood is a serious disaster, which directly and indirectly damages human activities, properties, and lives. The main reason for the disasters is climatic change, which makes the environment critical for human beings (Adeoye et al., 2009). Overpopulation is also the main cause of calamities such as deforestation, pollution, and other chemical gases. A huge population lives near the riverside, which is directly vulnerable to flooding (UN-ISDR, 2009; Darteh, 2010). Floods are the most devastating natural disasters, which affect financial losses and also human health. Old approaches to controlling flood vulnerabilities include the structure of buildings, sidewalls, and river channels like broadening. These structural approaches have reduced flood vulnerabilities and also helped to control economic losses from floods (Mileti, 1999; and Musiake, 2003).

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Akin (1987) stated that local communities might have a variety of strategies for coping with flood vulnerabilities, as demonstrated by previous experiences. Additionally, the approach demonstrates the importance of establishing a shared understanding among local governments, communities, and other stakeholders such as social media, schools, imams, and entrepreneurs, in order to promote effective preparedness for floods. Non-governmental organizations (NGOs) and technical experts must spread awareness. It is essential that the residents of an area comprehend one another's viewpoints and collaborate to create a common strategy (Alam, M 2014). This method of awareness will reduce flood vulnerabilities. Now people have become aware of the flood. People have found different strategies for controlling flood vulnerabilities.

In the past few decades, the number of floods has been increasing, with uncertain losses and threats to human lives. Flooding is the most devastating disaster, which damages the social, environmental, and economic structure of human life (Munich Re, 2002). When a flood occurs, it stops the developmental work. History says that from previous flood disasters, the ratio of deaths and economic losses is one-third as compared to other natural disasters. A flood occurs when humans make the environment vulnerable due to human-caused activities like making houses on the bank side of the river, poor design of infrastructure, and urbanization. As a result, human deposits have problems of their own (Hualou, 2011).

Gupta (2003) stated that old structural measures for flood losses and flood vulnerabilities are not enough for flood reduction. However, non-structural approaches like zoning regulations, use of land, and environmental restoration programs are found more beneficial in many countries like Japan and the United States of America for flood vulnerabilities (Gruntfest, 2000). In different countries, floods highly damage the developmental progress of nations and also affect agriculture. A million acres of fields and crops are destroyed, which causes financial losses as well as the development of a country. The common thing is that most poor people are more vulnerable to floods due to less economic support. Their houses are not protected from floods. The house structure plays a vital role in any disaster (Few, 2003).

Flood effects on health have also been a major topic of discussion for several years. The reduction of health risks is more important for healthy communities. Health risk reduction is also linked to cultural and economic issues. If the mind and health work accurately, then people can easily reduce flood vulnerabilities (Kaleem and Khattak, 2016). Vulnerability is a scale from 0 to 1, indicating the degree of damage to certain things in danger of flooding (no damage to full damage). Floods are a constant threat to residents living near rivers or even in low-lying coastal areas. They are much more prone to floods since they reside in a location that experiences varying degrees of flooding. The closer a canal is to a population centre in a flood zone, the greater the risk of flooding. Disaster is the consequence of an event that causes significant loss to human lives and property. Disasters depend upon the nature of the hazard is. How much risk perception is involved in it, and what is the vulnerability involved? Disaster is not a signal phenomenon (Kim et al., 2006). It depends upon the character of a person or a group. It is a phenomenon where a multiplicity of factors are involved. In terms of capacity to anticipate, cope with, resist, and recover, it varies from person to group or community. There is the key factor that we can see the concept of vulnerability of any individual or any community (Curtis and Mills, 2010).

Awareness of disaster risks is critical for a community mobilizing against flood hazards. However, the awareness program strategy assumes that people are unaware, and hence governmental organizations, non-governmental organizations, and technical competence must educate them (Kaleem et al., 2016). The experience has demonstrated that local towns and residents may be familiar with a variety of flood-fighting strategies. It is crucial that all parties residing in a region understand one another's perspectives and collaborate to develop a common plan. This strategy of communicating and sharing information across indigenous partners is referred to as disaster risk communication.

Pakistan is a developing country with the best natural resources. Its weather is pleasant, but for a few years now, it has changed with the passage of time. It gets very cold in the winter and very hot in the summer. This environmental change is the result of overpopulation and deforestation. In the past few years, 17 floods


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have occurred in Pakistan, but the 2010 flood was the most devastating flood recorded in its history. Millions of people became homeless and died because they lived near the river basin. The big reason is poverty. Poor people buy low-cost land for their shelters (Kaleem et al., 2016). These shelters are not able to resist the floodwater. Another factor was changes in the configurations of rainfall. A huge amount of water was recorded, which overflowed on crops, properties and infrastructure.

Charsadda is one of the most vulnerable and flood-prone areas in KP because of two rivers that flow through it; one is the Swat River, and the other is the Kabul River. (PDMA) reported that approximately 7200-280mm of rainfall was recorded in areas of Charsadda, and the river Kabul was reached (221,000 Cusecs) in 2010. Every year, the monsoon rainfall occurs in the months of June and July, which makes the Charsadda district the most vulnerable to floods.

## Objectives of the Study

1. To know about the socio-economic vulnerabilities of flood to the respondents.
2. To identify vulnerabilities of the local communities to flood in the targeted area.
3. To suggest policy recommendations in the light of the current study.

## Methods and Procedures

The current study adopted a quantitative approach. The Union Council of Agra was selected as the universe of the study due to the low economic status of the people and the vulnerability of the people to floods. From a total population, 150 sample respondents were selected to collect primary information through a questionnaire. A conceptual framework consists of the independent variable, i.e. economic vulnerability, and dependent variable, i.e. local community response towards flood vulnerabilities cross-tabulated through the application of Chi-Square test statistics to ascertain the association between the dependent and independent variables.

## Results and Discussion

### Relationship between Economic Vulnerability and Local Community Response

Table 1

| Economic Vulnerability | Responses | Local community response | | | Total | Chi-Square (P-Value) |
|---|---|---|---|---|---|---|
| | | Strongly Agree | Agree | Disagree | | |
| Poor families are more targeted to flood | Strongly Agree | 15 | 54 | 6 | 76 | $\chi^2$=35.167 |
| | Agree | 6 | 69 | 4 | 59 | |
| | Disagree | 0 | 15 | 0 | 15 | P=(0.002) |
| Awareness about flood vulnerabilities | Strongly Agree | 3 | 51 | 1 | 55 | $\chi^2$=30.869 |
| | Agree | 4 | 82 | 1 | 87 | |
| | Disagree | 0 | 5 | 3 | 8 | P=(0.000) |
| Economic status can reduce flood vulnerability | Strongly Agree | 2 | 90 | 0 | 92 | $\chi^2$=24.692 |
| | Agree | 5 | 22 | 4 | 31 | |
| | Disagree | 0 | 26 | 1 | 27 | P=(0.000) |
| Poor people buy cheap land for a house. | Strongly Agree | 0 | 34 | 0 | 34 | $\chi^2$=19.043 |
| | Agree | 7 | 63 | 5 | 75 | |
| | Disagree | 0 | 41 | 0 | 41 | P=(0.011) |
| your crops are more vulnerable | Strongly Agree | 3 | 95 | 4 | 102 | $\chi^2$=26.664 |
| | Agree | 3 | 16 | 0 | 19 | |
| | Disagree | 1 | 27 | 1 | 29 | P=(0.005) |

| Economic Vulnerability | Responses | Local community response | | | Total | Chi-Square (P-Value) |
|---|---|---|---|---|---|---|
| | | Strongly Agree | Agree | Disagree | | |
| People who live on the river bank are more vulnerable | Strongly Agree | 3 | 31 | 0 | 34 | $\chi^2$=20.542 |
| | Agree | 4 | 58 | 5 | 67 | P=(0.032) |
| | Disagree | 0 | 49 | 0 | 49 | |
| sidewall reduces flood vulnerabilities | Strongly Agree | 0 | 13 | 4 | 17 | $\chi^2$=25.504 |
| | Agree | 5 | 92 | 0 | 97 | P=(0.010) |
| | Disagree | 2 | 33 | 1 | 36 | |

## Association between Economic Vulnerability and Local Community Response towards Flood Vulnerabilities

The above table shows the association between economic structure and local community response towards flood vulnerabilities. P shows the significant and non-significant nature of the relationships and associations between variables. Whenever this value is less than 0.05, it shows a significant relationship, while on the other hand, if the p-value increases from 0.05, the relationship will be considered non-significant.

The finding in the above table indicated a significant (P=0.002) association between local community response and the statement that poor families are more targeted by floods. It may be the reason that low-income families have no resources and cannot afford to build any kind of safety wall to protect their houses and land. Moreover, they try to buy cheap land due to their economic conditions. The price of the land often depends on the facilities there and their vulnerabilities to natural calamities, particularly floods, which are more common in the area. It was also discovered that a family's financial situation was related to different stages of housing susceptibility. The same results were demonstrated by IFRC (2010), which discovered that individuals with significant financial assistance would purchase expensive land for their families and make the house the focal point of urban communities or where no flood reaches. In contrast, lower-income families are more helpless against floods since they buy the least expensive land and are unable to protect their land and houses from flooding.

Further, a highly significant (P=0.000) association was observed between awareness about flood vulnerabilities and local community response. This is consonant with the findings of Smith (2013), who stated that it is essential to develop a collaborative relationship amongst local governments, communities, and other agents such as social media, schools, and imams, as well as business owners, in order to promote successful flood preparedness. Nongovernmental organizations (NGOs) and technical experts must promote awareness. It is essential that all parties residing in a region understand one another's perspectives and collaborate to develop a common plan. This method of knowledge will help mitigate flood risks. Individuals have devised a variety of ways of mitigating flood vulnerability.

Likewise, a highly significant (P=0.000) association was found between economic status and the ability to reduce flood vulnerability and local community response. This is in line with the findings of Kaleem and Khattak (2016), who found that economic status plays the main role in human life. If a person is financially sound, then they will not buy land or houses in flood vulnerable areas. Poor people, who live primarily along rivers or in low-lying coastal locations, are constantly threatened by flooding. They are much more prone to floods since they reside in an area that experiences varying degrees of flooding. Flood effects on health have also been a major topic of discussion for several years. The reduction of health risks is more important for healthy communities. Health risk reduction is also linked to cultural and economic issues.

The results further show a significant (P=0.011) association between local community response and the statement that poor people often buy cheap land for cropping and housing. Low-income families are more affected by floods because of the vulnerability of their land to flooding. Likewise, the resolution of the UN General Assembly, International Strategy for Disaster Reduction UN-ISDR (2009), demonstrated that there is a strong connection

between the effects of flooding and areas that are more vulnerable to flooding. This is due to the fact that poor people often purchase cheap land, and they often make their homes from sloppy or minimally expensive materials.

Furthermore, the results reveal a significant (P=0.015) association between crops being more vulnerable and local community response. The results are in line with the findings of Munich (2002) that, for the past many decades, the number of floods has been increasing, with uncertain losses and threats to human lives. Flooding is the most devastating disaster, which damages the social, environmental, and economic structure of human life. Crops near the river are most vulnerable to flooding.

In addition, a significant (P=0.032) association was observed between people who live on the riverbank and local community response. Ligtvoet et al. (2014) also found that flooding is a natural type of disaster, which has been getting more frequent in recent decades. Natural calamities, particularly floods, continue to occur despite significant infrastructural capital invested in preventing their consequences. When the risks associated with riverbank and beach flooding (a significant source of escalating hazards) are combined with high rates of population growth and urbanization, it is obvious how an increased number of places are at flood risk.

Likewise, a significant (P=0.010) association was found between sidewalls' reducing flood vulnerabilities and flood vulnerabilities. With day-to-day increases in the population, the number of disasters will also increase. The same finding was revealed (Bakker 2009) that stream floods are expanding step by step, yet with appropriate support, their harm can be controlled by making side dividers on waterway banks. This strategy showed a helpful impact.

## Conclusion and Recommendations

The present study concluded that lower-income families are more vulnerable to flooding. It was also noticed that the financial situation of families interprets to differing stages of housing susceptibility. They buy cheap land for housing, which is more vulnerable to floods. Moreover, due to the vulnerability of their land, floods usually damage their crops. Likewise, people living near riverbanks are more vulnerable to floods compared to those living elsewhere. In addition, the better economic status of people reduces the vulnerability of people damaged by floods. It was found that high-income families built safety walls to protect their houses and land from flooding. The study recommends that the government and local authorities take the responsibility for protecting the lives and properties of the people in flood vulnerable areas through safety measures. NGOs should play a key role in raising awareness among local communities. Moreover, the government should make effective policies to measure the vulnerability and damage caused by floods among low-income families.

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