

## **Identifying Factors of Vulnerabilities to Natural Disasters: A Case of Malgagai Refugee Village Killasaifullah, Balochistan**

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### **Abstract**

*Disaster is the combination of vulnerability and hazard. Pakistan is affected by a number of natural and manmade disasters in the recent past. The main objective of this paper is to identify the factors of vulnerability to natural disasters of the study area. Data was collected through questionnaire survey among 400 households using sample random sampling. Results revealed that, there are many factors contributing to vulnerability but the physical location, poverty, illiteracy rate and the lack of institutional role are the main factors that make the village extremely vulnerable to natural disasters. The results further identified that the village is in a river channel making it vulnerable to flash floods. The structural measures taken are not enough to protect the community for future flooding. The construction of the houses needs to be revisited so that the community is protected in future disasters events. The study further recommends the necessary disaster risk reduction strategies to lessen the overall risk of the community for disaster resilience.*

**Keywords:** Vulnerability factors, Refugee, Disaster, Killasaifullah,  
Balochistan

### **1. Introduction**

Disaster is the combination of hazard and vulnerability. The adverse events of natural disasters are always resulting from geological and environmental process that overcome local response and distress the social and economic

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development of the affected community. Creeping disasters such as drought, famine, environmental degradation, desertification, and deforestation are the result of unlikeable weather situation together with poor land use (Sena and Michael, 2006). Rapid disasters like earthquakes, tsunami, floods landslide etc are the cause of geological and earth process. From recent past it has been observed that, natural disasters affected the economies, populations, infrastructures, and environments of various countries around the globe (Turner, 2003).

Rapid increasing trend of natural disasters and environmental variations are the cause of vulnerable communities prone to potential hazards, and communities become socially, economically and physically vulnerable (Cutter, 2003). Urbanization and vulnerable physical location play a vital rule in the growing trend of disasters. It is important to understand the disaster management activities prior to occurring a disaster, that guides the humanitarian response following disasters (Gallopín, 2006). Those communities are more vulnerable which is prone to natural hazard like drought, flood, tsunami, earthquake, landslides and many manmade disasters. These disasters contain deep impacts on environments and human wellbeing. The rapid increasing trend of urbanization and climate change are increasing risks and vulnerabilities around the globe (Ainuddin.S; 2012).

The impacts of natural disaster have been observed in the recent past and affected the populations, economies and infrastructures around the globe. Like Tsunami of 2004, Kashmir earthquake of 2005, Nepal earthquake of 2015, Tsunami of 2016 etc, Balochistan is highly prone to natural disasters and regularly hit by floods, droughts, earthquakes and other major events. These disasters have major impacts on communities, particularly socio-economic status is highly affected of population and often create severe problems in the attainment of sustainable economic and social development. Furthermore, impacts from disasters are not regularly dispersed within a population and tend to excessively affect the poorest and most marginalized groups. The study area is particularly prone to flood, drought and health hazard. Therefore, to identify vulnerability factors to natural disasters is the essential part of the development at grass root level, national level, regional level and international level for the policies related to disaster preparedness and hazard preparation.

### **1.1 Vulnerability**

The idea of vulnerability has been derived mostly from social sciences addressing environmental hazard and risks. The common use of the word vulnerability mention to the capacity to be incapacitate, means, the level to which a phenomenon is likely to occurrence destruction due

to exposure to a hazard (Turner et al, 2003). The concept of vulnerability is particularly used in geography and environmental sciences in the context of natural hazards research, but now a days it is becoming a part of other field studies as ecology, poverty, development, public health, adaptation and secure livelihood (Ainuddin.S, 2013).

Vulnerability is commonly used in thought of disasters (Liverman, D.M., 1990). The Red Crescent and Red Cross federation of international societies define vulnerability as, the diminished capacity of a group or an individual to cope, anticipate with oppose the crash of a man made or natural hazard. Many researchers have defined vulnerability through various definitions; this paper illustrates vulnerability as, the phenomenon or situation which makes the environment or community vulnerable to impacts of any hazardous or disastrous condition vulnerability has been regularly used in disaster and risk arena particularly used for disaster risk reduction (Cutter, 1996). Many researchers have identified many designs and conceptual frameworks for vulnerability, but its assessment is rare in research (Leon and Villagran, 2006).

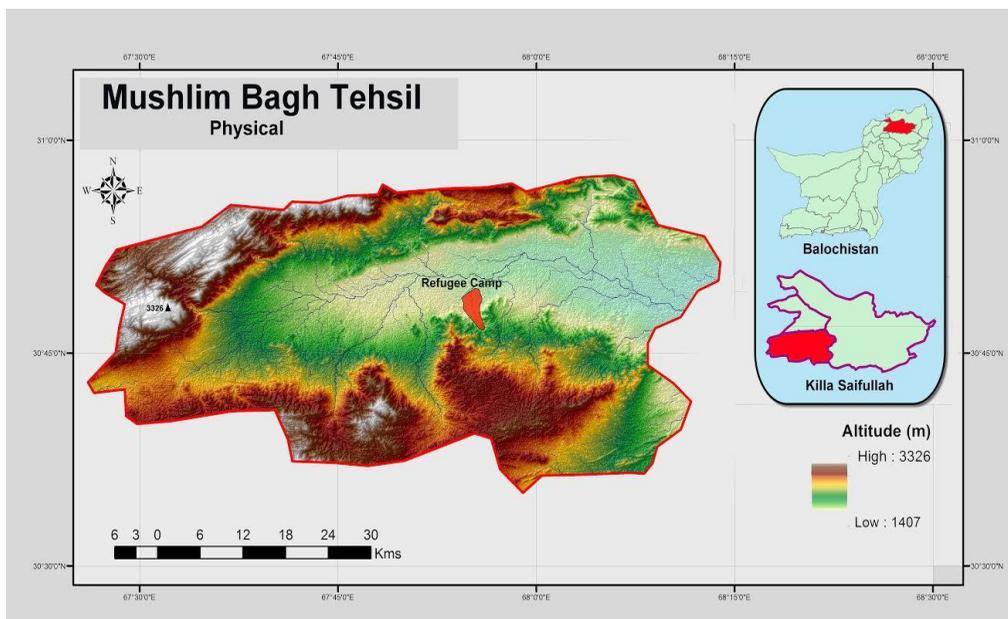
In the current situation the paper tries to identify the core causes and contributing factors to vulnerability in disaster scenario, for disaster risk reduction strategies and for sustainable development of the communities to respond to a hazard. In the context of environmental hazard, vulnerability geographically varies from place to place, time to time and among different social groups depending on their socio-economic status. Usually talking, vulnerability to ecological hazard means the potential for loss. In disaster arena, vulnerability has different directions depending on research perspective and attitude (Dow, 1992).

The community's level of vulnerability can be determined by social, physical, economical and institutional factors. These four main components are regularly discussed in literature. Every component has a significant role in vulnerability and links to each other. Thus, a community capacity to recover from losses after a disastrous event completely depends on these four components, particularly social component is the major component of it. Therefore, social component is widely focused in this study. As a result, these factors will prevent a population capacity to recover from disaster loss. It is clearly identified in research community that, poverty is a key contributor to vulnerability. Poor communities are less likely to have the resources to cope when a hazard strikes.

## 2. Study Area and Methodology

### 2.1 Study Area

An Afghan refugee camp is selected as a study area, situated in sub-district Muslimbagh Kilasaifullah. The study area was highly affected by various natural disasters like drought, flood and health hazard. On the basis of secondary information the total area of district Killasaifullah is 6,831 Square kilometres and is situated at ("67°17'37"- 69°22'54" East longitude, and 30°30'35"- 31°37'10" North latitudes (Planning and Development, Department Balochistan, 2011) . The total population of the village is consisting on more than 10000 individuals.



**Figure 1: Study Area Map**

### 2.2 Data Collection Tools and Methods

The objective of the paper achieved through primary and secondary data sources, primary data was collected through questionnaire survey among 400 sample respondents, and secondary data was collected from United Nation Higher Commission for Refugees (UNHCR), Killasaifullah district profile and provincial disaster management authority (PDMA). In the village there were more than 1000 households. House hold was the target group of the study and Sample size was selected on the basis of Arkin and Colton formula (1963) given as.

$$n = \frac{NZ^2 \times P \times (1 - P)}{Ne^2 + \{Z^2 \times P \times (1 - P)\}}$$

Where n = Sample size

N = Population size

Z = Confidence Level (95%=1.96)

P = Degree of Variability (50%)

e = Level of precision or sampling error which is  $\pm 5\%$

$$n = \frac{1150(1.96) * 0.50(1 - 0.50)}{1150(0.04) + \{(1.96) * 0.50(1 - 0.50)\}}$$

$$n = 394 \sim 400$$

During field survey all the questionnaire were filled by male respondents and there were no women in sample respondents due to customary values of the society. Mostly head of the household filled questionnaire. Frequency distribution was used for data analysis to identifying the factors of vulnerability to natural disasters. Data was analyzed through SPSS using both quantitative and qualitative methods along with Geographical Information System (GIS) for study area mapping. The study particularly identified the factors of vulnerabilities to natural disasters.

### **3. Results and Discussions**

#### **3.1 Factors Contributing to Vulnerability**

Generally, in disaster literature community there are many factors that contribute to vulnerability but some of the major factors which directly influence vulnerability, particularly in social science. These factors consist of, lack of ideologies, resources, knowledge, information and technology, lack of political struggle's, political will, limited access to social network, social capital, customs and beliefs, age, physical disabilities, physical location and density of infrastructures (Cutter, 2001; and Blaikie et al, 1994). Some other human factors also increase the vulnerability of the communities, intern of manmade disasters including deforestation, terrorism and inappropriate precautions etc (Cutter, 2003). In this study both the factors are addressed on the basis of prior studies, some of them are natural and some of them are human contributing factors.

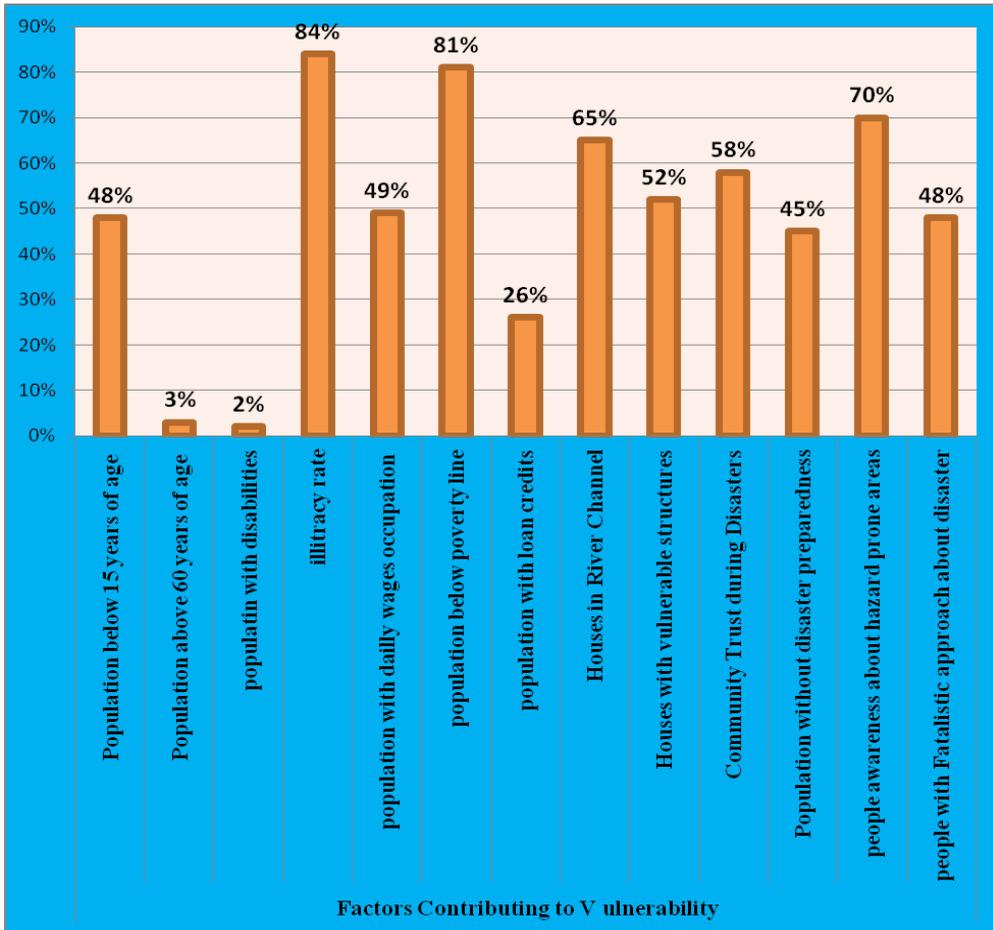
Different researchers arise different questions in the selection of specific factors/variables contributing to vulnerability on the basis of their significance

to represent the broader concepts clearly identifying vulnerability (Cutter, 2003). In prior research studies those factors are widely focused which directly influence the social vulnerability, cuter social vulnerability index is the major contribution to the research community. Generally, vulnerability can be divided into three main directions, firstly Physical/material conditions is the Initial condition of vulnerability including well-being, strength, resilience financial resource, Weak infrastructure etc. Constitutional/organizational condition is the second condition of vulnerability consist of lack of limited access to political power, lack of leadership, representative, lack of organizational structure and Lack of poorly resourced national and local institutions, Unequal participation in community affairs Inadequate skills and educational background, weak and non-existent social support networks and limited access to outside world. The last journal condition of the vulnerability is the Motivational/attitudinal condition which consists of rights, obligations, lack of awareness of development issues, certain cultural beliefs, fatalistic approach and Heavy dependence on external support are the key journal contributing factors of vulnerability (Adger, 2000, Cutter, 2003, and turner, 2003). Some of the specific factors which exist in the study area are focused as below in table.

**Table (3.2): Component Wise Factors, Contributing to Vulnerability**

S.N	Components	Description
1	Personal wealth	The capacity to absorb victims and increase resilience to disaster impact, economy enables communities to take up and get well rapidly from losses due to entitlements programs, insurance, and social safety Cutter, Mitchell, and Scott (2000).
2	Gender	In the community women is the more vulnerable group as compared to men, women have more difficulties during and after a disaster than men due to sector-specific, and children care responsibilities. Blaikie et al. (1994).
4	Age	Age wise two demographic groups are more vulnerable, people below fifteen years of age and people above sixty years of age. Parents drop time and assets caring for kids when daycare services are precious; aged people might have mobility constraints and cares, during disaster to evacuate both groups is the main issue for the community Cutter (2000).
5	Family structures	Families with large number of dependents on a single house head often have limited finance to outsource; such families are more vulnerable during recovery phase. Blaikai et al (1994).

6	Education	Education is associated to socioeconomic condition with higher educational ability resulting in better lifetime revenue. Higher the education is the greater understanding in disaster management activities, Adger, (2006).
7	Social dependence/ disability	Those people who are completely needy on social services or dependent on others due to low socio-economic profile or due to their disabilities, Such group is the most vulnerable group during disaster. Cutter, (2003).
8	Rural/Urban	Comparatively rural residents are more vulnerable as compare to urban residents due to low economy, low educational level, inaccessibility to disaster information like early warning etc and dependency on limited local resources, Cutter and Metchill (2000)
9	Physical location	Physically vulnerable location makes communities more vulnerable prone to natural hazards on accounts of their unique geographical location. Cutter (2003)
10	Role of institutions	The role of Institutions is very significant in disaster management activities it can play a vital role through better policies and strategies. Those communities are more vulnerable where institutions have no role, like the lack of awareness and preparedness at community level or local level. Turner (2003)



**Figure (3.1) Results of vulnerability contributing factors**

In the study area, illiteracy rate is the highest contributing factor to vulnerability, as researchers identified that, the education has a significant role in disaster management activities, higher the education level is better understanding with prior and post disaster activities, Lower the educational level of the community attracts the community towards vulnerability, as result identifies that, 84 % of the total population are illiterate in the study area, such factor contributes huge contribution in vulnerability which is a negative sign for the community. The poverty is the 2<sup>nd</sup> highest contributing factor to vulnerability in the study area. In disasters personal wealth is an important factor that identifies the community vulnerability or resiliency in term of wealth and is calculated on the basis of per capita income, it identifies that, how many people are lying below or above poverty line. The result identifies that 3<sup>rd</sup> of 4<sup>th</sup> part of population are lying below poverty line, as in figure 2. This is a risky sign for

the community to quickly absorb and recover from losses. From the past disasters events it has been observed that, the two demographic groups are most affected by disasters, people below 15 years of age and people above 60 years of age, as Results identifies that, almost half of the population is below fifteen years of age which is a negative sign for the community to evacuate such a huge population during disaster.

The second demographic group is slightly low vulnerable as only 3% of the population is above 60 years of age which is a satisfactory sign for the community. As well as occupation is focused with an important dimension for the vulnerability. The occupations play an important role to contribute resiliency or vulnerability. In the study area occupation is categorized by different categories but the daily wages occupation was the source of people earning. Those People who were heavily dependent on this occupation, might experience greater impacts from natural disasters and face slower recovery from disastrous events. As almost half of the population were dependent on daily wages occupation.

The structures and physical location of housing is an important component of vulnerability. The poor construction of housings contributes huge participation in vulnerability, as well as physical location also increase vulnerability. The study area was physically located in a river channel which makes the village extremely vulnerable to flood, as more than half of the houses of the study area were built in the river channel such river channel was prone to flash flood and due to such factor; the village was severally affected many times in earlier disaster events. Race is another factor which contributes to vulnerability; particularly it creates a social vulnerability in term of gender, religion, customs and colour etc. the lack of resources is playing an important role in such factor. The study area is vulnerable in term of gender as all the head of the households were male and women were not accessible to power and resources, gender inequality make communities more socially vulnerable.

The last vulnerability factor is the cultural beliefs and fatalistic approach of the people, as in the study area natural disasters were considered to be acts of God and taken as if there is nothing human beings could do to stop hazards from turning into disasters.

#### **4. Conclusion**

This study attempted to identify vulnerability factors based on prior studies focusing on natural hazards and risks with a detailed analytical method measuring the components in the form of sample percentages through frequency distribution. The vulnerability contributing factors are selected on the basis of prior knowledge and research presented by different researchers related

to natural hazard and their potentials. The selected factors are purely having existence in the study area, based on socioeconomic data gathered during field observation and questionnaire survey about various components of community vulnerability. In general, three main broader conditions identified contributing to vulnerability, physical/material condition, Constitutional/organizational condition, and motivational/attitudinal condition. Further these three conditions have sub factors including poverty, illiteracy rate, occupation status, physical location, infrastructures, age wise categorized population and people disabilities etc are those factors which directly contribute to vulnerability depending on their significance. Poverty, illiteracy rate, population below 15 years of age, baggy housing structures, physical vulnerable condition, daily wages occupation and the lack of awareness and preparedness at community level are the major contributing vulnerability factors in the study area. The study recommends the required improvements in economic sector, through diversified source of income to reduce the overall poverty level of the community that reduce the peoples vulnerability to a better extent in the long run; the education sector much needed attention on prior basis by rising the preparedness and awareness of community about their vulnerable situation and respond to a hazard. Implementing of risk lessening measures and carry out essential changes with disaster risk management activities is extremely fundamental to lessen the overall vulnerabilities of the study area prone to natural hazards.

## References

- Adger W.Neil (2000), Social and ecological resilience: are they related? *Prog Hum Geogr* 24(3):347-364
- Adger W.Neil (2006) Vulnerability. *Global Environmental Chang* 16:268-281.
- Ainuddin.Syed, and Jayant Kumar Routray (2012), Community resilience framework for an earthquake prone area in Balochistan, *International Journal of Disaster Risk Reduction* 2: 25-36.
- Ainuddin.Syed, and Jayant Kumar Routray (2011). Vulnerability assessment of an earthquake prone communities in Balochistan. *International Journal of Disaster Resilience in the Built Environment*, 5(2), 144-162.
- Clark; (2000), *Assessing Vulnerability to Global Environmental Risks*, Belfer Center for Science and International Affairs, Cambridge, MA.

- Cutter. LS; Shirley. WL (2003) Social vulnerability environmental hazards. Soc Sci Q 84(2):242-261.
- Cutter. LS, Barnes L, Berry M , Burton C, Evans E, Tate E, Webb J (2008b) A place-based model for understanding community resilience to natural disasters. Glob Environ Chang 18:598-606
- Cutter. LS, Burton GC, Emrich TC (2010) Disaster resilience indicators for benchmarking baseline conditions. J Homel Secur Emerg Manage 7(1):1-22
- Dow, K. 1992. "Exploring Differences in Our Common Future(s): The Meaning of Vulnerability to Global Environmental Change." Geoforum 23(3):417-36.
- Department P&D; Balochistan, and UNICEF. (2011). District Development Profile KillaSaifullah. 1-66.
- Gallopín, Gilberto C. (2006)"Linkages between vulnerability, resilience, and adaptive capacity," Global environmental change 16(3): 293-303.
- Leon, D. and Villagran, J.C. (2006) Vulnerability A Conceptual and Methodological Review  
Institute of Environment and Human Security, United Nations University-EHS, Japan.
- Liverman, D.M., 1990. Vulnerability to global environmental change. In: Kasperson, R.E., Dow, K., Golding, D., Kasperson, J.X. (Eds.), Understanding Global Environmental Change: The Contributions of Risk Analysis and Management. Clark University, Worcester, MA, pp. 27-44 (Chapter 26).
- Mitchell, J. K., ed. 2000. Crucibles of Hazard: Mega-Cities and Disasters in Transition. Tokyo: United Nations University Press.
- Pumariega, Andres J., et al. (1998) "II. Utilization of mental health services in a tri-ethnic sample of adolescents." Community Mental Health Journal 34(2): 145-156.
- Sena, L., & Michael, K. W. (2006 ). Disaster Prevention and Preparedness  
Jimma University In  
collaboration with the Ethiopia Public Health Training Initiative, The Carter Center, the Ethiopia Ministry of Health, and the Ethiopia Ministry of Education 1-180.

Turner, Billie L., et al. (2003) "A framework for vulnerability analysis in sustainability science." *Proceedings of the national academy of sciences* 100(14): 8074-8079.

UNDP (2004) *Reducing disaster risk: a challenge for development*, United Nations Development Program, New York.

UNCHR; (2014) *Participatory Needs Assessment of Afghan Refugees in Balochistan* UNHCR Sub Office Quetta, Balochistan, 1-98.