

DISASTER MANAGEMENT RISK PERCEPTION OF LOCAL COMMUNITIES

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ABSTRACT

Evidence shows that disaster experience and risk perception of the people has great impact on flood preparedness and mitigation. Awareness of and preparedness for disasters by the communities are essential for improved disaster management. In recent decade, Pakistan has had major flood disasters which greatly affect vulnerable communities. This paper examines the communities' experience of disaster and their perceptions on disaster risks in order to gauge their preparedness. Questionnaires were administered to 385 respondents using convenience sampling approach in seven flood prone districts of Pakistan. The results showed that the communities are moderately aware of flood risk. The study also indicates that there is positive correlation between risk perception and experience. For disaster preparedness, education indicates significant level of influence on risk perception. The paper concludes that effective communication of information and knowledge is critical to assist vulnerable

communities as part of the whole disaster management strategy.

Key words: Flooding, disaster, management, communities, perception.

1. INTRODUCTION

Pakistan has been experiencing severe hydro-meteorological disasters due to the effects of climate change and its uneven topography and in consequence received tremendous loss in almost all sectors. The most vulnerable group have been identified as people who are concentrated in rural areas, engaged in the agricultural sector, have low skills, limited access to education, adequate food, health services, and water and sanitation (Ninno et al; 2006). These people are also the most vulnerable to ill-health, economic dislocation and natural disasters, which invariably exacerbate material poverty. Disaster risk reduction (DRR) is a systematic approach to identifying, assessing, and reducing disaster risk, and it helps minimize the vulnerability of a society or community (Onstada et al; 2012). It also prevents or mitigates the adverse effects of natural disasters, facilitating a sustainable development process.

The Hyogo Framework for Action (HFA) provided an opportunity to

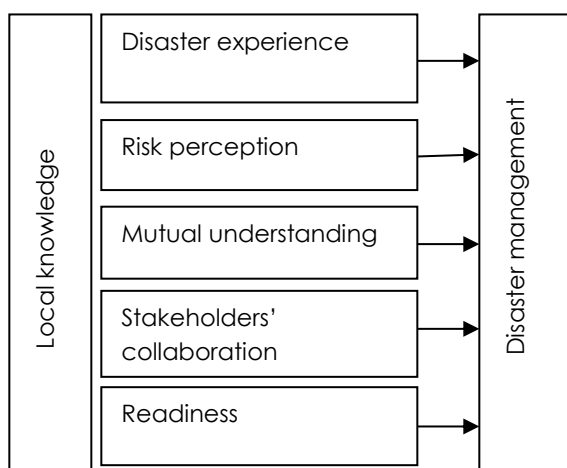
promote strategic and systematic approach to reducing vulnerabilities and risks. Apart from innovation and education, the HFA states that all countries must use knowledge to build a culture of safety and resilience at all levels. Disaster management relies on communities' knowledge or local population as they are the first available sources to tackle with disaster (Paton, 2007). In this regard, their knowledge in terms of their disaster experience and perception of risk in disaster preparedness, mitigation and prevention in overall disaster planning strategies is crucial. The local communities can best identify their immediate needs, coordinate preparations and supplement needed for future events. Thus perception and practices of local people should not be ignored and need to be taken into account. This does not mean that all local knowledge can be applied; however, relevant knowledge combined with other professional skills can contribute to an improvement of disaster preparedness activities (Dekens, 2007). A local knowledge system is composed of different knowledge types, practices and beliefs, values, and worldviews (Dekens, 2007). Such systems change constantly under the influence

of power relations and cross-scale linkages both within and outside the community. As such, local knowledge and practices need to be understood as adaptive responses to internal and external changes which result in disaster preparedness at local level. Although much work on human response and adaptation to natural hazards and disasters were undertaken in the developing world, less is known for developed countries.

Involving local communities in risk reduction or disaster management activities cannot be implemented easily in most countries (Hosseini et al; 2014). Many interventions by the authorities ignore local inputs in reducing vulnerabilities (UNISDR, 2008). This widespread lack of coordination in community based disaster risk management is mentioned throughout the literature as a source of failure in disaster management (Combaz, 2013). For Pakistan, enhancing local knowledge is crucial because of existing gaps in the disaster agencies response to the sudden onset of floods (Deen, 2015). This paper therefore explores the extent of local knowledge in Pakistan by focusing on the communities' knowledge on disaster experience and

level of risk perception i.e. two out of five fundamental components of local knowledge of communities (Figure 1).

Figure 1. Conceptual diagram of local knowledge acquiring disaster management



2. RESEARCH METHODOLOGY

The primary purpose of this study is to assess perceptions regarding the experience and risk related to disasters among rural communities in Pakistan in response to two research question: (1) How do the communities perceive their experienced on flood disaster/s; and (2) How do the communities perceive the risks related to the flood disasters. However, the important aspect in this paper is to find how level of education influence risk perception. A total of 385 questionnaires were administered to sampled households in seven flood prone districts of Pakistan. The survey was done

starting from June to September 2015. SPSS version 20 software was used to manage and analyze the data.

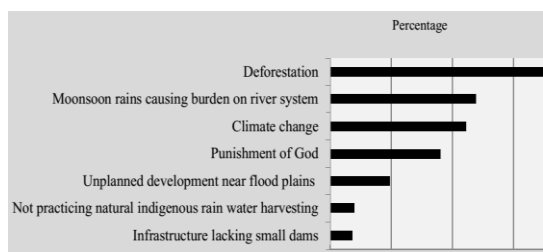
3. RESULTS AND DISCUSSION

The majority of respondents are men (96%) and only 4% are women. More than 50% of respondents are between the ages of 30 to 50 years old. Of the respondents, almost 22% never attend school while 17% only completed their primary education. This implied that the majority of respondents have minimal formal education. However 25% of them have either obtained a degree or much higher level. Almost 60% of them are farmers or work in agriculture related sector which indicate the critical dependent on the land for their livelihood. The overall validity of ten items for all variables in questionnaire showed a high reliability (Cronbach's alpha = .898). The individual variables of five items explaining disaster experience has relatively high reliability as indicated by Cronbach's alpha =.947 and for risk perception, the Cronbach's alpha = .922. The followings are the discussion on the results of analysis for communities' perception on causes of flood disaster, disaster experience and risk.

Communities' perception on causes of flood disaster

Figure 2, revealed that the majority of the respondent perceived that the major cause of flooding is deforestation. Climate change phenomenon including monsoon rain is also highly regarded as the cause. However, some of the respondent still persists that this might be the punishment of God.

Figure 2. Communities' perception on causes of flooding in Pakistan



Disaster experience of communities

The study questionnaire survey items included questions regarding communities past experience of flooding to their localities. The responses to 5 items concerning the communities' disaster experience are shown in (Table 1). The experience items asked respondents to Likert scale between five points. The mean scores for each item were sorted in order of low to high. The overall mean score was 3.41 which tends towards slightly moderate of the five-point scale

which implies that most communities have had experience of flood disaster. Interestingly, the majority of respondents agree that flood disasters increased over time and they have to rely on their own preparedness to cope with flood hazards.

Table 1. Perceived flood disaster experience

Items	Flood disaster experience	Mean	SD
EP1	I think the flood disasters increased over time in my region	3.39	1.24
EP2	I often come across flooding in my area of locality	3.43	1.23
EP3	My preparedness and readiness for flooding is due to my own experience and exposure with flood disaster	3.48	1.17
EP4	I use to evacuate during flood disaster	3.33	1.36
EP5	It takes a relatively long time to return home after evacuation	3.43	1.39

Risk perception of communities

Risk perception is the subjective valuation of the likelihood of a specified type of disaster happening and how concerned we are with the consequences (Sjoberg et al; 2004). To perceive risk includes evaluations of the probability as well as the consequences of a negative outcome. Therefore, understanding of perception of risk is essential to set priorities for the management of disaster

(Adelekan and Asiyambi, 2016). The risk perception survey questionnaire items contain five questions. All risk perception question items were answered in five Likert scale. The study approached to vulnerable localities that are currently living with flood risk (i.e.) living on flood plains. The respondents answer with ignorance or understanding of high risk showed their perception level. The communities responses to questions items related to risk perceptions are shown in (Table 2). Out of the 5 items, the majority of respondents think that they moderately safe from flood disaster. The mean scores of question items are below 3 which indicate that risks related to flood disaster is not very critical. This may imply a relatively low level of knowledge among these communities.

Table 2. Flooding risk perception

Items	5 items related to flood disaster risk perception	ANOVA test statistic (Level of education)
RK1	I think me and my family is safe from flood disaster	F(4,380) = 6.6 p= .000**
RK2	I am aware of flood disasters happening in the country	F(4,380) = 12.5 p= .000**
RK3	There is chance of occurring of flooding in my locality	F(4,380) = 10.6 p= .000**
RK4	Flooding is a big problem in my locality	F(4,380) = 8.5 p= .000**
RK5	I am aware that we live in flood prone area	F(4,380) = 9.9 p= .000**

Based on selected literature on risk perception (Wachinger, et al; 2013) identify four categories of main factors that determine risk perception: (1) risk factors, such as the perceived likelihood and frequency of an event; (2) informational factors, such as the source and level of information; (3) personal factors, such as age, gender, profession and personal disaster experience; and (4) contextual factors, such as family status, vulnerability indices and area of residence.

In this study, one way ANOVA, (Table 3) was performed to find out whether age and level of education

influence flood disaster risk perception. The findings show significant influence of level of education on risk perception. However, a large proportion of flood vulnerable communities are uneducated or have relatively low level of education, and this becomes a major challenge to the stakeholders in terms of overall preparedness and awareness of disaster and its management. Similar test was carried out to see the influence of age and education on flood disaster experience among members of the community. Both age and education have no effect on disaster experience.

Table 3. Level of education and risk perception

Items	Flood disaster risk perception	Mean	SD
RK1	I think me and my family is safe from flood disaster	2.95	1.29
RK2	I am aware of flood disasters happening in the country	3.01	1.19
RK3	There is chance of occurring of flooding in my locality	2.94	1.26
RK4	Flooding is a big problem in my locality	2.97	1.25
RK5	I am aware that we live in flood prone area		

Note. ** The difference is significant at the 0.05 level.

Post-hoc risk perception test

As the ANOVA test showed significant results between risk perception and education, further Post-hoc tests (Table 4) were performed to know the mean differences among communities groups perception with their level of education.

Table 4. Post-hoc multiple pair-wise comparisons of risk perception with level of education.

Items	5 items related to flood disaster risk perception	Comparisons between groups	Mean Difference	Sig.
RK1	I think me and my family is safe from flood disaster	Uned- Primary	.722**	.003
		Uned- Secondary	.576**	.037
		Uned- Graduate	.893**	.001
		Uned- Master or higher	.830**	.013
RK2	I am aware of flood disasters happening in the country	Uned- Primary	.954**	.000
		Uned- secondary	.738**	.002
		Uned- Graduate	1.16**	.000
		Uned- Master or higher	1.25**	.000
RK3	There is chance of occurring of flooding in my locality	Uned-Primary	.733**	.001
		Uned-Secondary	.557**	.027
		Uned- Graduate	1.08**	.000
		Uned- Master or higher	1.03**	.000
RK4	Flooding is a big problem in my locality	Uned-Primary	.536	.066
		Uned-Secondary	.569**	.040
		Uned-Graduate	.851**	.002
		Uned- Master or higher	1.219**	.000
RK5	I am aware that we live in flood prone area	Uned- Primary	.604**	.029
		Uned-Secondary	.636**	.016
		Uned- Graduate	.989**	.000
		Uned- Master or higher	1.30**	.000

Note. **. The mean difference is significant at 0.05 levels

A significant mean difference was found between the pairs (uneducated and educated respondents). However, the pair uneducated with primary level education for survey item (RK4), showed not significant ($=.536$ $p= .066$). This reveals that the communities with no education or having primary level education think flooding is not a big problem in their locality.

The second analysis examined the Pearson correlations to test the level of correlation among survey question items of flood disaster experience with the risk perception question items. Table 5, shows that disaster experience was moderately associated with risk perception items.

Table 5. Pearson Correlations matrix of experience with disaster risk perception

Items	EP1	EP2	EP3	EP4	EP5
RK1	.307**	.240**	.205**	.186**	.241**
RK2	.248**	.256**	.213**	.204**	.259**
RK3	.256**	.256**	.231**	.248**	.241**
RK4	.252**	.256**	.246**	.296**	.240**
RK5	.254**	.263**	.265**	.322**	.249**

Note. **. Correlation is significant at the 0.01 level (2-tailed).

3. CONCLUSION

The study examines the experience and risk perception of disaster vulnerable communities in Pakistan. The results of this study provide baseline information to governmental stakeholders and disaster management institutes which are working on disaster management in the country. The results of this study indicate that experience and risk perception showed strong correlation. The p values of survey items were less than 0.001 indicating a significant linear relationship between disaster experience and risk perception, meaning that people who have more floods experience has greater level of risk perception. Furthermore, the ANOVA and Post hoc test reveal that level of education influence risk perception of communities' knowledge.

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