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ANALYSIS OF DAMAGES CAUSED BY FLOOD-2010 IN DISTRICT PESHAWAR

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Abstract: Flood is one of the most serious hazards in the study area. This study was carried out to analyze the adverse effects of flood, 2010 in district Peshawar. To achieve the objectives, data were collected both from primary and secondary sources. Primary data was collected through questionnaire survey, interview and personal observations while secondary data was collected from flood related departments (Irrigation department, Meteorological office, Revenue office and housing department), topographic sheets, research reports and journals. Three sample villages were randomly selected from the flood zone for micro-level analysis. 100 questionnaires were filled from different professionals. Finally, the data was presented in the form of graphs and description analysis. The analysis revealed that there were seven death toll, 350 people injured, 32 livestock losses, one hundred and six houses and 52 shops were completely damaged during flood-2010 in the study area. Furthermore, houses have been constructed from mud and stones, which have little resistance to flood events and therefore at high risk. Great lose has been occurred to agricultural land followed by infrastructure. Root causes of the great losses were unawareness and lack of land use planning. Therefore, it is suggested to minimize the damages and losses in future, community should be aware and trained to respond quickly and positively and there should be proper management and control of the flood prone areas.

Key Words: Flood, damages, living environment, physical infrastructure, agriculture

Introduction

Floods are not unique to Pakistan. These come in different parts of the world. They become a problem when man attempts to compete with a river for the use of the floodplain (Tank, 1976). Floods become a disaster when such areas become exposed to the hazard without adequate warning and/or without means of taking defensive actions and the community suffers loss of life, assets, livelihood, and environmental security. Different authors have defined the term flooding in books and articles. It can also be defined as "flood is high flow of water, which inundates the natural channel, provided by natural flow of river (Foster, 1983). Any high stream flow which over-topped, the natural or artificial bank of rivers (Hassan, 1995). "Flood is the overflow of water" (Ward, 1978). "Flood is a body of water which rises to overflow the land which is not normally submerged" (White, 1945; Burton, *et al.*, 1978; Alexander, 1993). In the past decade, several countries including Bangladesh, China, India, Poland, Germany and Pakistan

have been seriously affected by disastrous floods (Mirza, 2003; Vuren, *et al.,* 2005; Dong, *et al.,* 2009).

In terms of economic loss and spatial extent, flood is considered to be the most destructive natural disasters (White, 1974; Changnon, 2005; Ali, 2007). When episodes of flooding occur, water overflows the channel and spills onto the adjacent floodplains (Hunter, *et al.,* 2005; Nathan 2008). As a result, disastrous floods cause great damages to social, economic and physical set-up (Rahman, 2003; Lehner, *et al.,* 2006).

Pakistan is exposed to multiple hazards of earthquake, flood, drought, water-logging, salinity and landslides (Rahman, *et al.,* 2011). Almost every year, floods have been causing massive losses to lives and other properties in the flood prone countries (Smith, 1992; Ali, 2007).

Three sample villages were randomly selected from the flood zone for micro-level analysis. The sample villages include Regi, Sheikh Kalay and Hasan Garhi. In the study area, flash floods during summer season is an environmental hazard. Consequently, it adversely affects lives and properties. There is great pressure on land particularly on agricultural land, as a result of the rapid expansion in the built-up area.

Due to this pressure, active floodplains are occupied for dwelling purposes. Consequently, they are vulnerable to flood hazards. It is, therefore, the need of the hour to safeguard land as well as settlements from flooding. The study area is traditionally predominated by agricultural activities. By damaging human habitations, crops, livestock and fields, it affects agricultural operations indirectly.

Methods and Materials

Data were obtained from both primary and secondary sources. Primary source was considered as the most appropriate tool for collecting data necessary for the study. Primary data were collected directly from the study area. For detailed and intensive study, three villages were selected by random means in the study area. The selected sample villages are namely Regi, Hasan Garhi and Sheikh Kalay. Questionnaire was designed in order to collect baseline information regarding the flash floods in Budhni Nallah. In the study area, 100 questionnaires were filled from the respondents which included people from variety of professions such as farmers (60%), educationalists (10%), labourers (20%) and businessmen (10%).

Secondary data were obtained from the flood-related Government Departments. There is no single Government Department responsible for flood hazard. The responsibilities are spread amongst different Government Departments like Irrigation department, Meteorological office, Revenue office, housing department etc. Secondary data was also collected from maps, topographic sheets, research reports; research papers and journals that provided information regarding flash floods particularly in the study area. Both primary and secondary data were analysed and presented in the form of graphs and description/ analysis.

Results and Discussion

In August, 2010, the torrential rain water flooded Budhni Nullah, which flows from Landi Kotal to Charsada killed many people, washed away a huge number of homes and devastated crops in the study area.

Impact on Living Environment

Human Casualties

According to field survey total seven persons were drowned in flood water and died. Six in village Regi due to sudden and very speedy flow of floodwater and one person in Hassan Garhi while the total number of injured is 350 in the study area. . (Fig. 1).

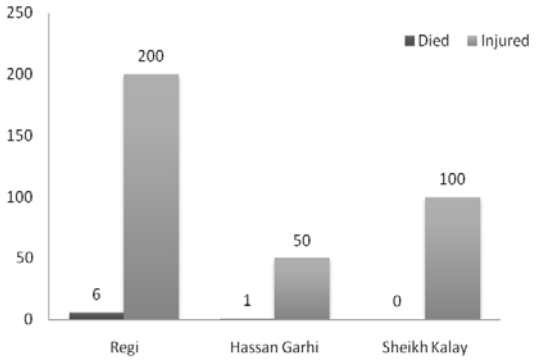

Fig. 1 Human casualties in flood, 2010

Livestock Losses

Being an agricultural based economy, people usually keep cattle like cows, buffaloes, sheep and goats, etc. to meet the need of milk. During this flood, a total of 32 cattle losses were reported in the study area whereas 55 cattle injured during this event (Fig. 2).

Fig. 2 Cattle losses in flood, 2010

Impact on Physical Infrastructure

Physical infrastructure such as buildings, roads, bridges, etc. also suffered during flood.

Damages to Houses

In the study area, most of the houses are mud-made. During flood, 106 houses completely collapsed in sample villages whereas 176 houses were partially damaged during the same flood (Fig. 3).

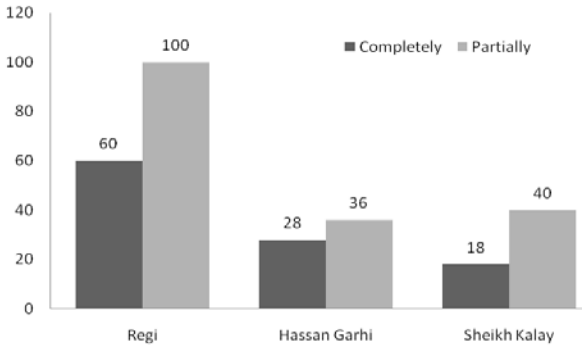

Fig. 3 Houses damaged in flood, 2010

Damages to Shops

In each village, there are shops of small-scale, which provide basic services to the village people. During floods like houses, shops also suffer damages in the form of commodities loss or damages to building. During this flood, 52 shops were completely and 79 partially damaged in the sample villages (Fig. 4).

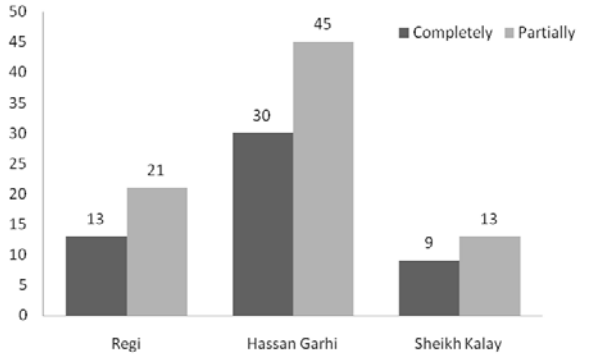

Fig. 4 Shops damaged in flood, 2010

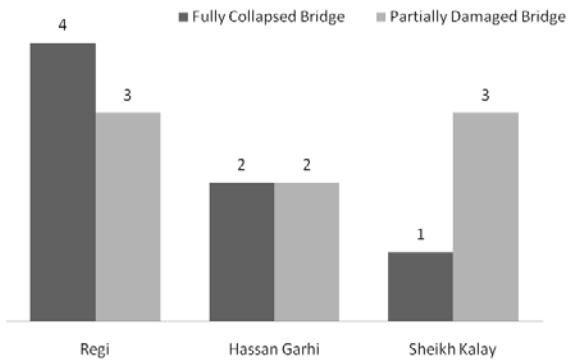

Fig. 6 Bridges damaged in flood, 2010

Damages to Mosques

Floods also damaged partially or completely the buildings of mosques. Fig. *5* shows the detail of damages to mosques.

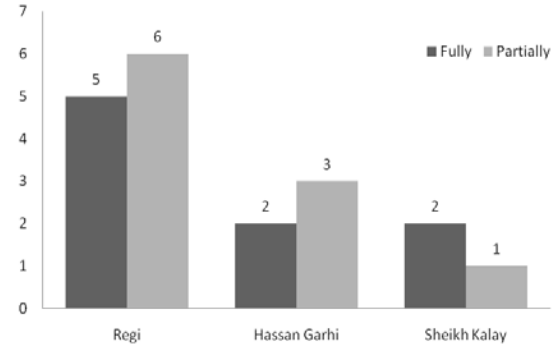

Fig. 5 Mosques damaged in flood, 2010

Damages to Bridges

Bridges on water channels also incur damages during flood conditions. Detail of completely washed way and partially damaged bridges of the study area is given in Fig. 6.

Impact on Agriculture

The economy of the study area mostly depend on agriculture activities. The flood has affected the agricultural land from different aspects. Flood either eroded the top fertile soil or damaged the standing crops. During flood hundreds acres of cropland were affected in the study area. Similarly, 401 acres of Kharif crop were badly affected.

Conclusion

The analysis revealed that the study area is one of the most vulnerable to flood hazards and has experienced severe and frequent floods which caused tremendous damages to the standing crops, buildings, infrastructure, lives and other properties. Present study revealed that the number of death toll during flood-2010 in the study area is seven (7) and 350 people become injured, whereas, the number of livestock losses and injured is 32 and 55, respectively. The analysis further revealed that in the study area, houses have been constructed from mud and stones, which have little resistance to flood events and therefore at high risk.

Total number of houses in sample villages is 785, out of which 106 houses were completely damaged and 176 were partially damaged. Regarding damages to shops, 52 shops were completely collapsed and 79 were partially damaged.

Number of affected mosques was 19 in which 9 were fully damaged and 10 were partially damaged. Agriculture sector claims the highest proportion of flood losses due to the dominance of agricultural activities in the study area.

Recommendations

The study area is suffering from flood hazards. In such a situation, the most important task at this stage is to suggest remedial measures to minimize the flood damages. In order to reduce the adverse effects of flood hazards in the study area, following are some suggestions against floods.

The analysis revealed that there is death toll and more than three hundred people were injured because of no awareness/education and no proper training/skills. Therefore, it is suggested that if concerned agencies/department provide trainings/skills particularly during monsoon season to the community leaders and affectees, to enable them to respond in an effective manner to the flood hazards and to take various remedial measures by themselves.

The second suggestion is land-use planning. In the study area, root cause of this great loss is uncontrolled land-use. If the land-use is controlled, not only will flood losses minimise but flood intensity will also decrease. For land-use regulation, proper management and for control of unauthorised land-use in future, it is necessary to apply zoning law in the flood plain.

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