

A Geospatial Analysis of Shishper Glacier Surge-Upper Hunza Gilgit Baltistan

Original Article

Shahid Bukhari¹, Alamgir A. Khan², Magdalena Ivasecko³, Farah Khan⁴

¹Hochschule Furtwangen University (Berlin Campus), Germany

²MNS University of Agriculture, Multan, Pakistan

³Philosophy, Concordia University, Montreal, Canada

⁴Bahauddin Zakariya University, Multan, Pakistan

Corresponding Author

^{2*} Alamgir A. Khan, E-mail: alamgir.khan@mnsuam.edu.pk

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In 2010, Pakistan experienced a massive flood that took the lives of 1985 individuals, in addition to causing huge damage to livestock, shelters, and domestic goods. Multiple local and international organizations extended support to the victims of the 2010 Pakistan flood. Beside relief support, media highly criticized their relief activities. The study was conducted in the district of Layyah, in the Punjab province of Pakistan. The study primarily aims at determining aspects of the flood relating to: ground situation and extent of damages, quality of services provided by the government and non-government organizations (NGOs). The study gathers data and analysis of data was carried out with simple statistical techniques. Ground situation in the country appeared alarming: flood affected 160,000 square kilometer of land, damaged to crop approached US\$ One billion, and affected around 20 million people. In the study area 40 % of livestock could not survive, 94.5 % houses were completely abolished and 38.7 % of domestic goods were heavily damaged. District government role was appreciated by 66.4 % of the respondents. Around 50 % of the respondents reported against the performance of the Provincial Disaster Management Authority and National Disaster Management Authority. 96.2 % of the respondents recognized the role of NGOs while respondents suggested working of NGOs through district governments.

Keywords: Disaster, Flood, NGO, District government, Policy, Management.

Recommendations

To ensure the safety of the people in the future, following recommendations are made for the policy makers.

- i. Disaster management training program for all possible stake holders in collaboration with district governments should immediately be initiated.
- ii. District government should be strengthened and entrusted to establish a separate disaster management cell in each district.
- iii. NDMA should establish a separate feedback system to collect recommendations/suggestions from district governments.
- iv. Province may launch disaster relief service monitoring system to examine the quality of services.

CONFLICT OF INTEREST:

The author(s) declare that the publication of this article has no conflict of interest.

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Introduction

Change in global climates have caused an increase in heavy rain, directly effecting the increase of floods in different parts of the world. A river flood caused by heavy rain, depends on the intensity, timing and volume of the river flows and their drainage basins. Human invasion in the flood plains and flood management system determines the intensity of human and economic loss. Gruntfest (1995) states that flood damages, directly affect human life (injuries & death rate, physical & mental health), agriculture, housing and other physical infrastructure.

Pakistan faced high floods in 2010. Massive rescue operations were launched by the Pakistani Government with the help of the army. Humanitarian organizations of foreign countries including Turkey, United States, England, Japan, Saudi Arabia, and many others sent air troops to Pakistan to help cope with the crisis. United Nations, International NGOs, local NGOs and charitable organizations claimed to do a lot in terms of disaster relief while victims and media criticized [1].

Media criticised the government relief services and blamed nonseriousness of the politicians which resulted in mismanagement of rescue operators [2]. Ahmed (2013) [3] evaluated the disaster management 2010 Act of Pakistan, and observed that the Act emphasizes institutional building and developing plans in the country. In the Act, disaster risk reduction approaches and allocation of funds are not clearly mentioned. Pulak Das (2012) [4] evaluated Indian Disaster Management Act 2005 and observed that the Indian Act requires each ministry in India to make disaster management plans and strategies. Pulak Das concludes that India has adopted a proactive disaster management approach instead of a reactive approach. Investment on flood preparedness, mitigation and prevention is more cost effective as compared to investing in the rehabilitation process. Salimuddin (2013) [5] demonstrates that Bangladesh has moved from traditional managerial approach, to the participatory approach during phases of the disaster. Collective decision making and resource sharing plays a significant role in disaster management process. Salimuddin confirms that Bangladesh is assuming pre-disaster preparedness approach instead of post facto approach. It also studied the flood management system in Bangladesh, and observed that the government of Bangladesh has introduced a fruitful Three Sector Governance Model to manage natural and manmade disasters. This model is based on coordination of three sectors: the government, private sectors and civil society during the progression of any disaster.

Sporadic studies surrounded different areas and steps from emergency declaration to rebuilding of the affected communities. These help on a limited scale, but literature is silent on addressing the ground realities and factual reasons for the failure of the disaster management systems. Accordingly, objectives of the current study were to:

- a) Explore and ascertain the real situation of the flood affected area.
- b) Analyze the extent of damages in the study area.
- c) Examine the quality of services provided by disaster response executing agencies.

During the Pakistan flood in 2010, a total of 1985 people died, about 21 million people were displaced, and more than 17,553 villages within an area of 160,000 square kilometers were effected [6]. Pakistan Bureau of Statistics [7] conducted a study in Layyah district and revealed that almost 80 % of the basic infrastructure was either completely or partially damaged. Basic services like drinking water, electricity, and access to markets were affected. Supply of clean drinking water was an essential problem faced by 13 union councils. Sanitation and hygiene was the area of concern in 12 union councils. Difficult access to water supply resulted in higher prices of essential commodities [8]. In general, people of Layyah showed top interest in rebuilding their homes, whereas the community's basic infrastructure remained second priority [9].

In South Punjab, Layyah, D. G. Khan, and Muzaffargarh districts were directly hit by the floods. Majid, et al. (2013) [10] conducted a study on the effects of 2010 floods in the District of Muzaffargarh. The study revealed that the national and international NGOs showed extensive and rapid response to provide relief measures during and after the floods, but the response of local politicians remained focused on saving their constituencies from the floods for which they did not hesitate to breach the roads and even river embankments. Memon (2012) [6] studied the working of National Disaster Management Authority (NDMA), Provincial Disaster Management Authority (PDMA) and District Disaster Management Authority (DDMA) and criticized their abilities to understand the diversity of the response during emergency. DDMA was the first tier to respond to the community right after the floods, but their immediate plans and resources to combat the situation did not prove successful.

Besides comparable damage, the situation in the Layyah district was barely analyzed by any study. As such, this study is a necessary contribution for enlarging knowledge on this subject. This study will focus on analysing the aftermath of the food situation in the District Layyah following the disaster. District Layyah is part of the Dera Ghazi Khan civil Division. It is situated at 30-45 to 31-24 North latitude and 70-44 to 71-50 East longitudes [11].

The city of Layyah was established by Kamal Khan, a Mirani Balooch in late 1550s. According to Population Census of Pakistan -1998, The total area of District Layyah is 6291 km² and its population is about 112,0951 people. Urban population consists of 144,203 persons (12.86 %) and rural population is 976,748 persons (87.14 %). Household size (average) is 7.3 persons. Layyah is a multilingual city but Saraiki speaking population is dominant which is reported to be 60 % of the total [12]. Literacy rate is 38.7 % including 52.98 % males and 23.39 % females. Annual growth rate of District Layyah is 3.10 % with a total of 152,050 housing units. Geographically, District Layyah is surrounded by district D. G. Khan and river Indus on the West, district Bhakar on the North, district Jhang on the East and district Muzaffargarh on the South as shown in Figure-1. There are four tehsils in district Layyah namely Layyah, Karore Lal Esan and Choubara; Tehsil Layyah has 44 union councils (UCs). The study was conducted in UC Kotla Haji Shah which was badly hit by floods in 2010.



Figure 1. Geographical map of district Layyah with Union Councils boundaries (Source: SHER)

The floods in 2010 affected 18 union councils of District Layyah, out of which 09 union councils were badly damaged. The study area (UC Kotla Haji Shah) is very close to the river bank with most of the urban area on the East side of the river. This union council is generally at the receiving end of medium level floods. The community has a history of facing floods and acquiring relief response from government as well as non-government organizations. Major structures/embankments to prevent city limits of district Layyah from floods were made in Kotla Haji Shah. For example, District authorities, NGOs and hundreds of citizens worked day and night continuously for more than 36 hours to strengthen the safety bund of Layyah City, and succeeded in protecting it from the flood [13].

Material and Methods

Statistical samples such as male and female flood victims, government and NGO officials were selected as samples. A total of 235 flood victims from the community of UC Kotla Haji Shah that resided by the riverside and 20 senior officials from district government and various NGOs were selected as sample size for the research.

Randomized sampling technique was used to ensure proper depiction of the respondents and accuracy of the data [14]. The data was collected by using two well-structured questionnaires to meet the objectives of the study, copies of which are placed at Annexure-1 and 2, respectively. The first questionnaire was specifically designed to record data from the flood victims while the second was developed to record response from the government and NGO officials. Both the questionnaires contained closed end and open-ended questions. Open ended questions helped record information as narrated by the respondents, and close-ended questions helped gather information through dichotomous and multiple questions as described by Nalzar (2012) [15].

The collected data was analyzed by using SPSS-2010. Quantitative research method technique, i.e., descriptive statistic was used to analyze the data. The data was collected in two phases. In the first phase, the flood affected area of Kotla Haji Shah was visited. Samples from villages were collected approximate proportion to population. 235 samples from 13 villages of the study area were collected. Village wise samples collected are shown in Table1.

Table 1. Village wise number of samples

Name of the village	No. of samples collected	Name of the village	No. of samples collected
Annar	12	Jooni	41
Chah Shah Alam	33	Kanjil	62
Machi	6	Mekan	5
Noor Wali	38	Zangeza	3

Kankappi	6	Makeen	14
Qaisrani	1	Sobaywala	10
SumraNasheb	4		

In the second phase, data was collected from officials of district government and various NGOs. These included Dy. District Officer (Social Welfare and Bait-ul-maal Department), District Officer (Community Development Department), District Officer (Literacy and Non-Formal Basic Education), District Officer (Labor Welfare Department), Assistant Director (Local Government and Community Development Department), Sub Divisional Officer (Public Health Engineering Department), Community Development Officer (Public Health Engineering Department), District Officer (Civil Defence Department) and Community Safety Officer 1122. Similarly data from NGOs and welfare societies was also collected which included Doaba Foundation, Danish Foundation, Aas Welfare Society, Integrated Development Support Program, Rural Community Development Society, Lodhran Pilot Project, Plan International, Society for Human Empowerment & Rural Development (SHER), Sustainable Development Initiative (SDI), Community Empowerment of GRM International, Futures Group and Need Society Layyah[16].

Results and Discussion

Situation of damages in the Area

Table 2 summarizes study results related to livestock, shelter, and domestic goods. Table 2 elaborates least, medium and heavy damage. Here least damage means 20 % of total damage, medium damage means 20-40 % of the total damage and heavy damage means damage 40 % and above of the total damage.

Table 2. Situation of the Area and Damages

Description	Least Damage (%)	Medium Damage (%)	Heavy Damage (%)
Livestock	59.60	23.00	17.40
Shelter	1.70	3.80	94.50
Domestic Goods	35.30	26.00	38.70

Livestock

The data related to livestock survival was collected and analyzed. Restoration of livestock is important to poor community as (Mutembei, 2015) [17] conducted a study on restoration of livestock during a disaster in Kenya. The conclusions of the study revealed that restoration of livestock during the disaster is unavoidable for the poor community of Kenya. Table 2 presents a summary of the results. The least damage denotes the proportion of livestock that moved from the flood area to a safe place and above 80 % of the moved survived after major or minor illness. Medium damage denotes livestock that moved from flood area to safe place, and 60 to 80 % of moved livestock survived. Heavy damage represents the proportion of livestock which could not be moved and perished in the flood area.

Table 2 illustrates that 59.6 % of the livestock had minimum damage, 23 % had medium damage and 17.4 % had heavy damage. Around 83 % of the livestock were moved from the study area to safer places, and 23 % of the moved livestock did not survive. Most of the livestock remained on the flood safety embankments without barn, and shortage of fodder, making flood borne diseases common. The mortality of livestock can be related with the lack of facilities to protect animals, the widespread of diseases, and the shortage of fodder or the limitation of veterinary medicines and medical experts.

The heavy damage affecting 17.4 % of the livestock in the study area has been considered huge. Public revealed that some residents of the area refused to move livestock before flood. Relief services provided support to the related heavy rain damage which caused such a dense flood in the surrounding area. The residences admitted a lack of transportation in carrying the livestock from the disaster area to the safer place. Moving livestock during the flood became difficult due to the limited livestock moving facilities.

The study agrees with McBride (2004) [18], who declares that livestock management is an art during any crisis, and it varies from disaster to disaster. Normally, rural communities have the tendency to keep their livestock during a crisis. During the course of the disaster, the residences carry for their livestock instead of ensuring the safety of their own lives. That is why the study suggests that livestock management should be considered in the pre-disaster preparedness process, as opposed to during the crisis. The sufficient transport and trained officials are required to evacuate the livestock from the disaster affected areas.

Shelter

Second row of Table 2 represents a summary of analyzed data signifying damage caused by floods to shelters. The least damage denotes repairable damage to houses; medium damage denotes partially repairable damaged; and heavy damage denotes un-repairable damage to buildings, including complete abolishment of shelters. Figure 2 shows pictorial glimpses of the damage caused to clay houses in the study area. These pictures were collected from an NGO, Rural Community Development Society (RCDS).

Results show that the proportion of least damage to shelter was 1.7 %, medium damage was 3.8 %, and the heavy damage was 94.5 %. Riverine area in Pakistan is underdeveloped and economic conditions of residents of riverine are not good.



Figure 2. Clay house and prominent damage (Source: RCDS)

Residents of the study area are living below the poverty level and cannot afford to make brick masonry houses, so, majority of the houses in the study area were made of clay. Only public sector schools have a proper design to withstand floods by considering historic flood data. Buildings of the schools have RCC pillars frame structure, and brick masonry construction. These schools were considered safe places because the floods could not cause any damage to these schools. Elevated buildings of these schools were utilized as camps for flood relief activities. The small proportion of least to medium damage to shelters can be related with elevation of the building. 95 % of the heavy damage to shelters can be attributed to low elevation, poverty, and poor quality of building materials. Collective shelter centers are important factors in minimizing disaster, and for this reason, a few school buildings served as limited, but safe places for flood victims. This finding agrees with the suggestions of Melgarejo (2014)[19], who conducted a study in Colombia during the 2011 flood, and suggested that collective centers may be established to accommodate the flood victims.

Domestic goods

The third row of Table 2 summarizes the damage done to domestic goods. The least damage denotes loss of clothes, blankets, and kitchen accessories. Medium damage denotes loss of furniture, books, bicycles, television, and refrigerators, etc. Heavy damage denotes loss to expansive belongings such as money or jewelry, legal documents and property papers. It also includes loss of food for humans and animals, such as stock of wheat, rice, and processed animal feed and grown fodder.

The proportion of least and heavy damages, was 35.3 % and 38.7 % to domestic goods, respectively. This indicates that victims preferred protecting the lives of family members, as opposed to protecting domestic goods and other belongings. A medium loss of 26.0 % can be related to the recovery of sunken items during the flood. Emergency situation and insufficient transport or evacuation facilities can also be blamed for damage to domestic goods. This discussion agrees with the findings of Berkoune(2012) [20], who reported logistic management as an important component of the relief operation. Berkoune asserts that disastrous situations require efficient logistics and transport systems during disaster relief operations.

Role of Provincial and Federal Governments

Table 3 is the brief analysis of responses received from the public, government officials, and NGOs. A total of 20 respondents took part for this portion of questionnaire in the study. The respondents were equally divided regarding support from the National Disaster Management Authority (NDMA) and the Provincial Disaster Management Authority (PDMA), to cope with the havoc of floods. Half of the respondent informed that NDMA and PDMA workers were adequately prepared to face the disastrous situation of floods, while the remaining half of the respondents blamed NDMA and PDMA for being ill prepared to cope with the situation. NDMA and PDMA officials were neither familiar with the area, nor did they have a proper rout planned to access victims under their jurisdiction. Duplication of the relief efforts of NDMA and PDMA in the same area was also reported. Duplication means intervention of more than one NGO having same relief services in the same area without proper documentation of the services.

Memon (2012) [6] also evaluated flood relief activities and concluded that PDMA and NDMA were not prepared to combat the situation. Memon (2012) [6]also declares that the

recent disasters in Pakistan have proved that NDMA is incapable of coping with an emergency situation like floods. Memon (2012) [6] further suggests that NDMA needs to extend its program at the grassroots level.

Table 3. Response relating to the performance of relief organizations

Description	Agreeing Response (%)	Disagreeing Response (%)
NDMA/PDMA		
Role of NDMA/PDMA	50.00	50.00
Monitoring of NGOs by NDMA/PDMA	20.00	80.00
District Government		
Role of District Government (DG)	66.80	33.20
Precautionary measures	94.00	6.00
Satisfactory arrangements	66.40	33.60
Politicians		
Role of Politicians	30.00	70.00
Support to the relief organizations	61.70	38.30
Influence of politicians on NGOs	80.00	20.00
Influence of politicians on government	85.00	15.00

Among all the respondents, 66.8 % were in the favor of the relief services provided by district government offices; while 33.2 % were not satisfied with relief services provided by the district government offices. Generally, officials of district government offices are residents of the given area, and directly communicate with the residences of the district. Since the officials of district government are local, they seem to have strong attachment with the victims. They feel comfortable approaching the truly needed people and provide them with available support [21].

District government took precautionary measures before the incident of the flood. Precautionary measures included the steps taken for flood preparedness, such as pre-flood warnings, repair and maintenance of bunds and irrigation channels, health care teams, arrangements of transport, and placement of trained staff to handle the emergency situation. Table 3 indicates that 94 % of the affected community praised the district government efforts for precautionary measures. Bubeck (2012) [22] conducted a study on flood preparedness in riverine belt of River Rhine in Germany. Results of the study were similar to the current study, as 94 % respondents favored precautionary measures taken by the German government.

According to the mandate of the NDMA, it acquires a supervisory role on the working of different NGOs to monitor the role and functions of different NGOs working in Pakistan. The tendency of the response as shown in Table 3 indicates that 20 % of the officials agreed that NDMA was monitoring the work of the NGOs. On the other hand, 80 % of the respondents did not agree. The disagreement can be linked with long distance management because PDMA and NDMA have very limited access in the remote areas of the country. They have established their offices only in the metropolitan cities of the country. They also provide equal job opportunities country wide. People are hired in one corner of the country and posted in other. That is why; it was not so easy for these organizations to monitor the NGOs, working in the remote areas of the country.

Role of Politicians

The data shown in Table 3 indicates that only 30 % of respondents from the officials of various NGOs and district governments were in favor of the efforts of politicians to help flood victims. On the other hand, 70 % of the respondents were not satisfied with the role and efforts of the politicians. The role of politicians cannot be overlooked as McLean & Ewart (2015) [23] supported the involvement of politicians during disaster management activities.

Considering the influence of politicians in the study area, their role was also evaluated. Flood response organizations needed local facilities to store their support items and expected assistance from public representatives. The data indicates that only 38.3 % respondents favored the assistance offered by the local politicians. While, 61.7 % respondents openly spoke on the failure of local politician to provide any support to the flood relief organizations. Fair distribution of relief goods was highly criticized due to the negative role of politicians. 80% of respondents blamed politician for preferring their allied victims, and negatively influencing the work of NGOs. Politicians of the area were found guilty of taking credit for the services provided by NGOs.

The influence of politicians was also criticized by the government officials, as 85 % of the officials confirmed the influence of politician for helping their allied victims. Poverty and low level of literacy could be the potential reasons for this influence of politicians.

Role of NGOs

The capacity for NGOs to help victims during the disaster has been crucial in strengthening the public’s perception of NGO’s capabilities. Table 4 illustrates that 94.5 % of people thought that NGOs were capable of coping with such emergency situations. Most of

the NGOs work under the guidelines set by the international NGOs. Findings of Erika Vye (2007) [24] also agree with the positive response of public related with the capacity of NGOs to cope with emergency situations.

Disaster necessitates a quick response for the timely protection of humans, livestock, goods, and property. Table 4 shows that 96.2 % of respondents were of the opinion that NGOs showed a quick response in terms of preparedness of NGOs, to handle the emergency situations.

Rehabilitation of flood affected area is possible through good and timely relief, and recovery services. NGOs not only respond immediately to disasters, but also provide post disaster services to the victims. Table 4 shows that 75 % of government officials responded in favor of the contribution regarding of national and international NGOs. The favorable response can be related with the previous experience of the victims by the NGOs.

Table 4. Response relating to performance of NGOs

Description	Yes (%)	No (%)
Capabilities to overcome crisis	94.50	5.50
Response after flood	96.20	3.80
Contribution in recovery services	75.00	25.00
Collaboration of INGOs with local NGOs	90.00	10.00

Institutions like NDMA and PDMA also contributed in recovery services, but their efforts were not appreciated by most of the respondents. The most common complaint of the respondents was the NDMA and PDMA’s rather ineffective distribution and allocation of funds. People thought that only NGOs were working for them. Institutional incompetence and financial constraints faced by government organization was also reported by Obaidullah Nadeem (2014) [25].

During Pakistan flood of 2010, independent activities of various organizations were prominent. In order to determine public opinion upon independent and collaborative efforts, a question was included in the survey. Table 6 shows that 90 % of the respondents were in favor of collaboration among INGOs and local NGOs for effective service delivery. Larry Winter Roeder (2013) [26]also suggested that the people working with humanitarian NGOs should be prepared to work with other small NGOs who are working across the border.

The analysis of the data collected from the flood victims, government officials, and NGOs officials, revealed a non-uniform distribution of relief funding, due to non-coordinated activities of different agencies. Accordingly, this study proposes a model as depicted in Figure 3, which suggests that all relief activities should be executed only by district government (DG). In the model, all national or international funding sources have been assigned a single name of ‘donor.’ According to the proposed model, three different streams can exist: national NGOs, PDMA and NDMA. It is obvious in the model that each stream ends with the single sector of district government.

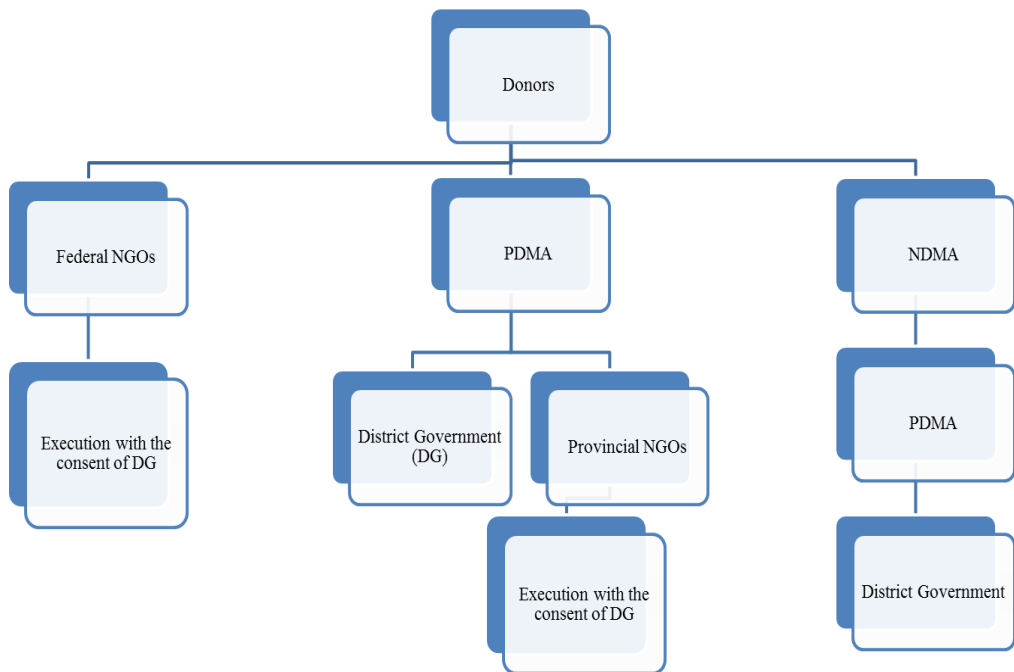


Figure 3. Proposed model for potential implementation of disaster management plans

Stream one suggests that in case federal NGOs obtain funding from donors and plan to provide relief directly to victims, then they must seek consent from the district government. Stream two describes the case where PDMA receives funding from the donors, and plans to distribute via government or NGOs. This stream proposes two options. Option one suggests execution of relief activities directly through the existing set up of district government. Option two of stream two recommends providing funding through provincial NGOs but execution with the consent of district government. The third stream of proposed model suggests

channelling of funds allocated from donor to NDMA, and NDMA may make a formula for annual allocation to each province via PDMA. Each PDMA may reserve a portion for unforeseen incidents and allocate funding to each district government for pre-disaster management plan.

Conclusion

Analysis of the collected data from flood victims and officials of the government and NGOs suggests that almost 40% of livestock perished during 2010 flood in Pakistan. Among the non-survivors, 23 % of livestock was moved to safe places, but they died due to the shortage of veterinary experts and medicines. 17 % of livestock were not moved from the flooded area due to the non-availability of sufficient transportation. 94.5 % of houses were completely destroyed, because the houses were comprised out of clay. Acute shortage of transport facility was noticed, due to which people were unable to move their possessions to a safe place. Results showed that 38.7 % of domestic goods were heavily damaged, 26 % of the damage was of medium scale, and 35.3 % was least damaged.

This study relates heavy rain damage, with a lack of planning and groundwork by private and public sector. Community response related to performance of government organizations such as NDMA, PDMA, and district government was very diverse. National Disaster Management Authority (NDMA) and Provincial Disaster Management Authority (PDMA) have been established to work at federal and provincial level, respectively. Though the set mandate for these authorities is commendable, the response of both the organizations at the time of the flood in 2010 remained below expectations. Mixed response was observed in terms of effective role of provincial and federal disaster relief authorities. 50 % of the respondents stated that PDMA and NDMA had failed to combat the disastrous situation of the flood in 2010. Poor monitoring of NGOs by the government sector was highly criticized by the respondents, as 80% of the respondents indicated that NDMA and PDMA could not monitor the working of NGOs.

Results further indicated recognizable satisfaction of respondents upon relief action initiated by the district government. In general, 66.4 % of people were satisfied by the performance of district government, and 94 % of respondents reported that precautionary measures taken by the district government were logical and systematic. Most of the respondents (92.8 %) supported the coordination of district government and NGOs. Uniform and fair distribution of supplies by the district government to the victims provided 91.1 % satisfaction rate.

It was also concluded that the satisfactory performance of the government organizations was due to working network and familiarity of service providers with the disaster area. NDMA and PDMA headquarters are situated in the national and provincial capitals. They have limited network in remote areas of the country. NDMA and PDMA provide equal job opportunities country wide. Employees are hired from one corner of the country and posted in different area. This can cause problems in terms of familiarity with the area and language. On the other hand, district governments have uniform and dispersed network through revenue collection staff, civil defense, school teachers, fire brigade and rescue 1122. For quick response, emergency squads are quite familiar with the road maps of the district. Most of the officials working in the district government are residents of the same district, and this gives them an advantage. Although emergency response plans of NDMA, PDMA and district governments were similar; nonetheless the performance of the district government has been strongly recognized by the flood victims and appeared better than the performance of NDMA and its subsidiaries.

Data and information collected from the flood victims, officials of the government and NGOs, helped conclude that the role of politicians was relatively disappointing during the course of the floods in 2010. The community relies on getting support from local and national politicians for disaster relief process as satisfaction of victims is important. However, 70 % of respondents informed that politicians did nothing for their relief. Various disaster relief organizations anticipated support from the local political set up, but 61.7 % of people responded that the politicians did not support these organizations. Partial and favoritism of politicians were further highlighted by the respondents. Despite giving support to the community and organizations working for the flood victims, 80 % of respondents reported that politicians were influencing the NGOs to provide relief only to their cronies. Similarly, 85% of the people stated that politicians influenced the government officials to work for their allies.

The role of national and international NGOs was well recognized by the respondents as 96.2 % of them appreciated the vibrant role of national and international NGOs. In addition to government reports, 94.5 % of respondents considered that NGOs had the capacity to overcome such a crisis. Beside capacity, satisfaction of the beneficiary is an important aspect. The study indicated that 85 % of people were satisfied with their capabilities to handle the emergency situation. Overall, the recovery services were also appreciated by 75 % of the people in the study area, and they were pleased with the provision of recovery services by

NGOs. Both national and international NGOs served well, but their mode to service was different. Instead of separate action, joint action for both the NGOs was supported by the respondent. 90 % of people were of the opinion that international NGOs might have served better if they were working in collaboration with the local NGOs.

Finally, mixed response was witnessed regarding efficiency of government and non-government institutions' performance; during the period of flood 2010 in District Layyah. Instead of firming up DDMA, it is required to equip district governments with disaster management skills and strategies because they have the capacity to cope with the havoc of disaster effectively. On the other hand, international NGOs may serve better if they work in collaboration with the local NGOs.

References

- [1] S. A. Mahmood and S. Batool, "River Profile Modeling Through Surface Deformation Using RS / GIS , A Case Study Swat River," *Int. J. Innov. Sci. Technol.* Vol 2 Issue 3 PP 75-88 September 2021, 2020.
- [2] "Pakistan Floods of 2010 | Britannica." <https://www.britannica.com/event/Pakistan-Floods-of-2010>.
- [3] Z. Ahmed, "Disaster risks and disaster management policies and practices in Pakistan: A critical analysis of Disaster Management Act 2010 of Pakistan," *Int. J. Disaster Risk Reduct.*, vol. 4, pp. 15–20, Jun. 2013, doi: 10.1016/J.IJDRR.2013.03.003.
- [4] P. Das, "Disaster Management in India : Policy Review and Institutional Structure," *Asia-Pacific J. Sci.*, vol. IV, no. 1, pp. 37–52, 2012.
- [5] C. E. Haque and M. S. Uddin, "Disaster Management Discourse in Bangladesh: A Shift from Post-Event Response to the Preparedness and Mitigation Approach Through Institutional Partnerships," *Approaches to Disaster Manag. - Examining Implic. Hazards, Emergencies Disasters*, Apr. 2013, doi: 10.5772/54973.
- [6] "Malevolent Floods of Pakistan Naseer Memon," Book.Vol 1, PP 1-56 2010. <https://spopk.org/wp-content/uploads/2019/11/malevolentfloodrepo.pdf>
- [7] "District at a glance Layyah | Pakistan Bureau of Statistics." <https://www.pbs.gov.pk/content/district-glance-layyah>.
- [8] A. Abbas, I. Hussain, A. Wahab, A. Shafique, and M. Zaheer, "Bacteriological and Physicochemical Analysis of Groundwater of Kasur," *Int. J. Innov. Sci. Technol.*, Vol 01 Issue 04: pp 151-167, 2019, doi: 10.33411/ijist/2019010411.
- [9] K. Chohan *et al.*, "Riverine Flood Damage Assessment of Cultivated Lands along Chenab River Using GIS and Remotely Sensed Data: A Case Study of District Hafizabad, Punjab, Pakistan," *J. Geogr. Inf. Syst.*, vol. 7, no. 5, pp. 506–526, Sep. 2015, doi: 10.4236/JGIS.2015.75041.
- [10] S. Mahmood, A. Sajjad, and A. ur Rahman, "Cause and damage analysis of 2010 flood disaster in district Muzaffar Garh, Pakistan," *Nat. Hazards*, vol. 107, no. 2, pp. 1681–1692, 2021, doi: 10.1007/s11069-021-04652-6.
- [11] A. R. Cheema, A. Mehmood, and M. Imran, "Learning from the past: Analysis of disaster management structures, policies and institutions in Pakistan," *Disaster Prev. Manag.*, vol. 25, no. 4, pp. 449–463, Aug. 2016, doi: 10.1108/DPM-10-2015-0243/FULL/PDF.
- [12] "Layyah Online – The Largest Online Portal of District Layyah Punjab Pakistan." <https://layyahonline.net/>.
- [13] M. Aamir *et al.*, "Analysis of Flood Damage Assessment through WorldView-2, Quick Bird and Multispectral Satellite Imagery in Southern Punjab, Pakistan," *Int. J. Innov. Sci. Technol.*, vol. 1, no. 02, pp. 120–139, 2019, doi: 10.33411/ijist/2019010310.
- [14] F. Olken and D. Rotem, "Random sampling from databases: a survey," *Stat. Comput.* 1995 51, vol. 5, no. 1, pp. 25–42, 1995, doi: 10.1007/BF00140664.
- [15] Nalzar (2012) "Chapter 9-METHODS OF DATA COLLECTION." <https://www.slideshare.net/ludymae/chapter-9methods-of-data-collection>.
- [16] S. A. Gillani *et al.*, "Appraisal of Urban Heat Island over Gujranwala and its Environmental Impact Assessment using Satellite Imagery (1995-2016).," *Int. J. Innov.*

- [17] H. Mutembei, C. Mulei, and P. Mbithi, “Restoring community livelihoods and food security through livestock asset during drought disasters: case study of Mwingi, Kenya,” *African J. Food, Agric. Nutr. Dev.*, vol. 15, no. 3, pp. 10047–10059, Sep. 2015, doi: 10.4314/ajfand.v15i3.
- [18] S. Cotton and T. McBride, “Caring for Livestock After Disaster,” *Color. State Univ. Ext.*, vol. 1816, no. 1, 2010. www.ext.colostate.edu
- [19] L. F. Melgarejo and T. Lakes, “Urban adaptation planning and climate-related disasters: An integrated assessment of public infrastructure serving as temporary shelter during river floods in Colombia,” *Int. J. Disaster Risk Reduct.*, vol. 9, pp. 147–158, 2014, doi: 10.1016/J.IJDRR.2014.05.002.
- [20] D. Berkoune, J. Renaud, M. Rekik, and A. Ruiz, “Transportation in disaster response operations,” *Socioecon. Plann. Sci.*, vol. 46, no. 1, pp. 23–32, Mar. 2012, doi: 10.1016/J.SEPS.2011.05.002.
- [21] X. Liu, H. Sahli, Y. Meng, Q. Huang, and L. Lin, “Flood Inundation Mapping from Optical Satellite Images Using Spatiotemporal Context Learning and Modest AdaBoost,” *Remote Sens. 2017, Vol. 9, Page 617*, vol. 9, no. 6, p. 617, Jun. 2017, doi: 10.3390/RS9060617.
- [22] P. Bubeck, W. J. W. Botzen, H. Kreibich, and J. C. J. H. Aerts, “Long-term development and effectiveness of private flood mitigation measures: An analysis for the German part of the river Rhine,” *Nat. Hazards Earth Syst. Sci.*, vol. 12, no. 11, pp. 3507–3518, 2012, doi: 10.5194/NHESS-12-3507-2012.
- [23] H. McLean and J. Ewart, “Hindrance or Help? A Model for the Involvement of Politicians in Communicating with Publics During Disasters,” *Int. J. Mass Emerg. Disasters*, vol. 33, no. 2, pp. 228–252, 2015.
- [24] J. A. Lassa, “Roles of Non-Government Organizations in Disaster Risk Reduction,” *Oxford Res. Encycl. Nat. Hazard Sci.*, no. July, pp. 1–23, 2018, doi: 10.1093/acrefore/9780199389407.013.45.
- [25] O. Nadeem, A. Jamshed, R. Hameed, G. A. Anjum, and M. A. Khan, “Post-Flood Rehabilitation of Affected Communities by NGOs in Punjab, Pakistan-Learning Lessons for Future,” *J. Fac. Eng. Technol.*, vol. 21, no. 1, pp. 1–19, 2013, [Online]. Available: <http://111.68.103.26/journals/index.php/jfet/article/view/286%0Ainternal-pdf://0.0.1.61/286.html>.
- [26] L. W. Roeder and A. Simard, “Diplomacy and negotiation for humanitarian NGOs,” *Dipl. Negot. Humanit. NGOs*, pp. 1–456, Jan. 2013, doi: 10.1007/978-1-4614-7113-4.



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