

# IMPACT OF FLOOD DISASTER IN DISTRICT MUZAFFARGARH AND ROLE OF GOVERNMENT/NGO'S IN THE REHABILITATION

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**ABSTRACT:** Pakistan is one of the most natural disaster-prone countries in the World. Natural disasters often result in great losses, in terms of both materials and people's lives. During 2010 floodwater caused huge devastation in Muzaffargarh District. Public infrastructure, agricultural land and homes were intensely affected by floodwater. Many parts were unapproachable by road and some important bridges were collapsed. The aim of the present study explored an assessment of flood rehabilitation strategies in Muzaffargarh district. At the first stage two union councils i.e. Union Council No. 46 (Manka Bhutta) and Union Council No. 44 (Ghazanfargar) were selected randomly, at the second stage four villages, two from each UC (Hassan Pur and Golay wala from UC- 46 and Mosa Wala and Jilal Wala Peer from UC-44) were selected randomly. Proportional sample size of 110 respondents was selected by simple random sampling technique. Data were collected through well-structured interviewing schedule and were analyzed through Statistical Package for Social Sciences (SPSS). It was found that floods had negative impact on income and economic sources of the respondents. The major areas affected by flood were irrigation system (72.7%), housing (63.6%), agriculture (82.7%), livestock (74.5%), transport and communication (79.1%), education (77.3%), health (85.5%), water supply and sanitation (84.5%) and environment 87.3%. Main problems found in flood affected areas were unavailability of safe drinking water, food, health facilities, clothes and living space. Government and non-government organizations (NGOs) had major role in rehabilitation of people in flood affected areas through provision of basic necessities of life.

## INTRODUCTION

A temporary rise of the water level, as in a river or lake or along a seacoast, resulting in its spilling over and out of its natural or artificial confines onto land that is normally dry is termed as flood. Floods are usually caused by excessive runoff from precipitation or snowmelt, or by coastal storm surges or other tidal phenomena [1]. Flooding is the gathering of water where there is usually none or the overflow of excess water from a stream, river, lake, reservoir, or coastal body of water onto nearby floodplains. Floods are natural events that are deemed harmful only when people and property are affected. Floods caused more property damage as compared to other natural hazards. Floods cause damages to structures, roads, bridges and other features from high speed of flow and due to wastage carried by floodwaters. Floods also cause economic losses through shutting down of businesses and government facilities; interrupt communication; disturb utilities such as water and sewerage services; contribute for excessive expenditures for emergency reaction; and generally disturb the normal working of a society [2].

Pakistan is one of the most natural disaster-prone countries in the world. Natural disasters often result in great losses, in terms of both materials and people's lives. Four provinces, AJK and Gilgit Baltistan are vulnerable to one or the other geo-climatic disaster. Over 40% of landmass is vulnerable to earthquakes, 6% to cyclone, 60% to floods and 25% of the barani land under cultivation is vulnerable to drought. Extreme floods in 2010 resulted the loss in terms of lives and the assets destroyed have been incalculable. A disaster wipes out the gains achieved in decades of development in the affected area. Repeated disasters threaten sustainable development and destroy decades of human efforts and investments, thereby placing new demands on society for reconstruction and rehabilitation [3].

Approximately 84176 houses are damaged across the eight districts of the province Punjab, Pakistan. According to the last updates shared by the Relief and Crisis Management Cell.

About 8 million people were affected by flood across the province and damaged 1.45 million acres of agriculture land in district Bhakkar, Layyah, Muzaffargarh, Dera Ghazi Khan and Rajanpur [4].

In Pakistan, floods became responsible for displacement of two million people and left more than 10 million at risk of disease outbreak lacking access to clean water. The displaced population which is physically inaccessible to relief workers due to damaged infrastructure, faces threats of disease, starvation and dehydration. According to experts, the floods will leave their impact on Pakistan and the region for years or decades [5].

## Statement of The Problem

Present study investigates the vicious impact of flood on socio-economic conditions of people in district Muzaffargarh and the role of government and non-government organization in rehabilitation of flood affectees. The worst situations created by flood stimulate to conduct a deep study, which demonstrates the harmful impact of flood on socio-economic condition of people in district Muzaffargarh. Recently flood has devastated infrastructures, agriculture land and heritage items on a large scale. The rate of poverty and unemployment has also been increased manifolds. The resulting unemployed contributed to enhance the rate of crimes in district Muzaffargarh. Current flood has swapped away everything on the earth in district Muzaffargarh.

## Objectives of the Study

The objectives of study were:

1. To find out the socio-economic and demographic characteristics of the respondents
2. To investigate the socio-economic and infrastructural damages caused by recent flood
3. To study the role of government and non-government organizations in rehabilitation of flood affected areas
4. To suggest some policy measures for flood rehabilitation

## MATERIALS AND METHODS

Methodology refers to more than a simple set of methods,

rather it refers to rational and the philosophical assumption that underline a particular study. This is why scholarly literature includes a section on the methodology of the research [6].

**Locale of the Study:** Present study was conducted in District Muzafargarrah. The aim of the present study was to explore the assessment of flood rehabilitation strategies in Muzaffargarh district.

**Sampling Technique:** At first two union councils *i.e.* Union Council No. 46 (Manka Bhutta) and Union Council No. 44 (Ghazanfargar) were selected randomly, at the second four villages, two from each UC (Hassan Pur and Golay wala from UC-46 and Mosa Wala and Jilal Wala Peer from UC-44) were selected randomly.

**Sample Size:** Proportional sample size of 110 respondents was selected by simple random sampling technique.

**Data Collection Tool:** Data were collected with the help of a well-designed interview schedule.

**RESULTS AND DISCUSSIONS**

Analysis of data and interpretation of results are the most important steps in scientific research. Without these steps generalization and prediction cannot be made, which is the target of scientific research. Generalization and conclusions are drawn based on characteristics and attitudes of the respondents. Both Uni-variate and Bi-variate statistical analysis were performed.

**Uni-Variate Analysis**

**Socio-economic and Demographic Characteristics of the Respondents**

**Status:** Table 1 presents the age distribution of the respondents. Data presented in Table 1 show that about one-third *i.e.* 33.6 % of the respondents had up to 35 years of age, while a major proportion *i.e.* 44.5 % of the respondents had 36-50 years of age, whereas about one-fifth *i.e.* 21.8 % of the respondents had above 50 years of age. Mean age of the respondents was 43.07 years with standard deviation 11.57 years.

**Table 1: Socio-economic and Demographic Characteristics of the Respondents**

Age (in years)	Frequency	Percentage
Up to 35	37	33.6
36-50	49	44.5
Above 50	24	21.8
	Mean age = 43.07	Std. Dev. = 11.57
<b>Education of the respondents</b>		
Illiterate	52	47.3
Primary-Middle	37	33.6
Matric and above	21	19.1
	Mean years of schooling = 4.07	Std. Dev. = 4.33
<b>Monthly income (before flood)</b>		
Rs. up to 10000	36	32.7
Rs. 10001-15000	43	39.1
Above Rs. 15000	31	28.2
<b>Monthly income (after flood)</b>		
Rs. up to 10000	64	58.2
Rs. 10001-15000	31	28.2
Above Rs. 15000	15	13.6

**Table 2: Distribution of the respondents according to their assessment about the damages during flood**

Factors	To a great extent		To some extent		Not at all		Total	
	F.	%	F.	%	F.	%	F.	%
Irrigation system	80	72.7	23	20.9	7	6.4	110	100.0
Housing	70	63.6	37	33.6	3	2.7	110	100.0
Agriculture	91	82.7	19	17.3	0	0.0	110	100.0
Livestock and fisheries	21	19.1	82	74.5	7	6.4	110	100.0
Transport and communication	87	79.1	18	16.4	5	4.5	110	100.0
Energy	90	81.8	18	16.4	2	1.8	110	100.0
Social and gender	2	1.8	88	80.0	20	18.2	110	100.0
Financial, private sector and Education	2	1.8	84	76.4	24	21.8	110	100.0
Health	85	77.3	17	15.5	8	7.3	110	100.0
Water supply and sanitation	94	85.5	10	9.1	6	5.5	110	100.0
Environment	93	84.5	13	11.8	4	3.6	110	100.0
	96	87.3	11	10.0	3	2.7	110	100.0

Table 1 also presents the educational level of the respondents. A substantial proportion *i.e.* 47.3 % of the respondents was illiterate, while about one-third *i.e.* 33.6 % of the respondents had primary-middle level education and slightly less than one-fifth *i.e.* 19.1 % of the respondents had matric and above level education. Mean years of schooling was 4.07 with standard deviation 4.33 years. It means literacy level was very low in the study area. According to the Government of Pakistan [7], the literacy rate for the population (10 years and above) was 58 % during 2010-11, as compared to 57 % in 2008 -09. Literacy remains much higher in urban areas than in rural areas and much higher for men than for women.

Table 1 further presents the monthly income (before flood). Slightly less than one-third *i.e.* 32.7 % of the respondents had up to Rs. 10000 monthly income, 39.1 % of them had Rs. 10001-15000 monthly income before flood and more than one-fourth *i.e.* 28.2 % of the respondents had above Rs. 15000 monthly income before flood. Table 1 also presents the monthly income of the respondents (after flood). More than half *i.e.* 58.2 % of the respondents had up to Rs. 10000 monthly income, 28.2 % of them had Rs. 10001-15000 monthly income and only 13.6 % of the respondents had above Rs. 15000 monthly income. According to FAO [8], the floods had bad impact on economic sources and income.

**Assessment about the Damages during Flood:**

Table 2 reveals about different areas that were affected by flood. A large majority *i.e.* 72.7 % of the respondents reported that irrigation system was badly affected while 20.9% of them reported that the irrigation system was damaged to some extent during flood. A large majority *i.e.* 63.6 % of the respondents revealed that housing was

damaged to large extent while 33.6% of the respondents reported this damage to some extent. A vast majority *i.e.* 82.7 % of the respondents reported the destruction of agriculture to a greater extent followed by 17.3% of respondents who reported this loss to some extent. Slightly less than one-fifth *i.e.* 19.1 % of the respondents reported that livestock was badly affected by to some extent while 74.5 % of them disagreed this statement. Almost 79 % of the respondents reported the damage of transport and communication to great extent while 16.4 % of them reported this damage to some extent. A large majority *i.e.* 81.8 % of the respondents agreed that energy sector was destroyed by flood to great extent while 16.4 % of them reported this damage to some extent. Majority *i.e.* 76.4 % of the respondents assessed to some extent about the financial, private sector and industries damage during flood while 21.8 % of them never agreed with this damage. A large majority *i.e.* 77.3 % of the respondents unveiled that education was affected to great extent while 15.5% of them reported that it was affected to some extent. A huge majority *i.e.* 85.5% of the respondents favoured that health problems were to great extent followed by 9.1% of respondents who responded this statement to some extent. A vast majority *i.e.* 84.5% of the respondents reported that water and sanitation areas were badly affected by flood while this response was to some extent by 11.8% of the respondents. Similarly, [9] found that the Pakistan government estimates total economic damage to be near \$15 billion, or about 10 % of GDP. Damage to infrastructure alone (roads, power plants, telecommunications, dams and irrigation systems and schools and health clinics) amounts around \$10 billion.

**Table 3: Damage to infrastructure**

	Frequency	Percentage
Facing any lose of crop due to flood		
Completely destroyed	64	58.2
Partially destroyed	15	13.6
No land	31	28.2
Total	110	100.0
Facing land erosion and salinity due to floods		
Completely erosion and salinity	64	58.2
Partially erosion and salinity	15	13.6
No land	31	28.2
Total	110	100.0

Distribution of the respondents according to facing any loss of crop due to flood and extent of land erosion and salinity due to floods

**Table 4: Distribution of the respondents according to their opinion how much their sources of income are disturbed due to flood**

Respondents' opinion how much their sources of income are disturbed due to flood	Frequency	Percentage
Partially (1-50%)	6	5.5
Badly (51-80%)	22	20.0
Completely (81-100%)	82	74.5
Total	110	100.0

**Loss of Crops Due to Flood and Land Erosion, Salinity:**

Table 3 shows that more than a half *i.e.* 58.2% of the respondents reported that their crops were completely destroyed due to flood, while 13.6% of them revealed that their crops were partially destroyed. Above results are in line with those of Marin [10] who found that more than 1.1 million houses were completely destroyed and more than 2 million hectares of standing crops were damaged or lost. Table 3 further reflects that more than a half *i.e.* 58.2 % of the respondents were facing completely erosion and salinity problems, 13.6 % of them were facing partially erosion and salinity problems.

**Opinions about Sources of Income:**

**Disturbed Due to Flood:** Table 4 reveals that only 5.5% of the respondents reported that their sources of income were partially (1-50%) disturbed due to flood, while 20.0% of them told that their sources of income were badly disturbed by flood, whereas a majority *i.e.* 74.5% of the respondents reported that their sources of income were completely disturbed by flood. WFP [11] also reported that a majority of households' livelihood was severely affected by flood with decrease in income.

**Damage of Houses Due to Flood:** Table 5 shows that a majority *i.e.* 70.0% of the respondents reported that their houses were completely destroyed, about one-fifth *i.e.* 20.9% of them reported that their house was partially destroyed

**Table 5: Distribution of the respondents according to the damage of their house due to flood and**

Damage of house	Frequency	Percentage
Completely destroyed	77	70.0
Partially destroyed	23	20.9
Cracked walls	10	9.1
Total	110	100.0

**Table 6: Distribution of the respondents according to the type of problems faced by them during flood**

Problems	Yes		No		Total	
	F.	%	F.	%	F.	%
Safe drinking water	107	97.3	3	2.7	110	100.0
Food	105	95.5	5	4.5	110	100.0
Appropriate health facilities	110	100.0	0	0.0	110	100.0
Availability of cloth	104	94.5	6	5.5	110	100.0
Limited living space	110	100.0	0	0.0	110	100.0
Privacy disturbance	110	100.0	0	0.0	110	100.0
Any other	6	5.5	104	94.5	110	100.0

**Table 7: Distribution of the respondents according to role of government/NGOs in rehabilitation of flood affected area (n=110)**

Facilities	To a great extent		To some extent		Not at all	
	F.	%	F.	%	F.	%
Loan facility for agriculture purpose	0	0.0	0	0.0	110	100.0
Loan facility for livestock purpose	0	0.0	0	0.0	110	100.0
Loan facility for housing	0	0.0	14	12.7	96	87.3
Housing/shelter facility	0	0.0	106	96.4	4	3.6
Food	4	3.6	106	96.4	0	0.0
Employment	0	0.0	10	9.1	100	90.9
School	0	0.0	108	98.2	2	1.8
Roads	0	0.0	104	94.5	6	5.5
Sewerage system	0	0.0	9	8.2	101	91.8
Irrigation system	0	0.0	43	39.1	67	60.9

**Table 9: Bi-variate analysis**

Variables	Chi-square	D.F.	P-value	Gamm a
Education of the respondents	11.24	4	0.04*	0.215
Income after flood (Rs.)	12.41	4	0.03*	0.264
Having agricultural land	5.75	2	0.05*	-.304

Dependent Variables: Assessment about the role of govt. /NGOs in flood rehabilitation \* = Significant

and remaining 9.1% of the respondents told that their walls were cracked due to flood. According to the PDMA [12] that more than 1.1 million houses were completely destroyed or made un-live-able and more than 2 million hectares of standing crops were damaged or lost.

**Problems Faced During Flood:** Table 6 presents the type of problems in the flood-affected areas. Table shows that a huge majority *i.e.* 97.3% of the respondents reported that they faced safe drinking water problem, while another vast majority *i.e.* 95.5% of them had food problem and all of them had lack of health facilities during flood disaster. An overwhelming majority *i.e.* 94.5% of the respondents faced problem in availability of clothes. All of the respondents had limited living space and privacy problems.

**Role of Government and NGOs in Rehabilitation of Flood Affected Area:** Table 7 shows that the government and non-government organization had no role in loan facility for agriculture and livestock purpose, while 12.7% of the respondents reported that the government and non-government organizations provided them loan facility for housing. A large majority *i.e.* 96.4 % of the respondents unveiled that the government and non-government organizations provided housing/shelter facility to some extent. About 4% of the respondents reported that the government and non-government organizations provided them food facility to a greater extent, while a significant majority *i.e.* 96.4% of them reported that the government and non-government organization provided them food facility to some extent. About 9% of the respondents reported that the government and non-government organizations provided employment opportunities to some extent in flood-affected areas, while about 91% of them revealed that the government and non-government organizations never provided employment facility. A huge majority *i.e.* 98.2 % of the respondents were agreed that government and non-government organizations provided them school facility to some extent while 94.5% of them agreed that government and non-government organization provided roads facility. Whereas few respondents *i.e.* 8.2% of them reported that the government and non-government organizations provided sewerage system in their area and 39.1% of the respondents told that the government and non-government organizations provided facility of irrigation system. Therefore, it is evident from above table that the government and non-government organizations will have to play their role in housing/shelter, food and the improvement of infrastructure in the flood affected areas. In flood affected areas, public schools were the initial shelters for the displaced people. For this purpose, 2064 schools are being used as Relief Camps (officially/un-officially) for flood affecties at present.

**Bi-Variate Analysis:** Chi-square value (11.24) shows asignificant association (0.04) between education of the respondents and their assessment about the role of govt. /NGOs in flood rehabilitation. Gamma value shows a positive relationship between the variables. It means educated respondents had more assessment about the role of Govt. /NGOs in flood rehabilitation as compared to illiterate respondents. So the hypothesis “Higher the education of the respondents, higher will be assessment about the role of govt. /NGOs in flood rehabilitation” is accepted. Chi-square value (12.41) shows a significant association (P=0.03) between income of the respondents after flood disaster and their assessment about the role of govt. /NGOs in flood rehabilitation. Gamma value shows a positive relationship between the variables. It means if the respondents had more income after then they had also more assessment about the role of Govt. /NGOs in flood rehabilitation. So the hypothesis “Higher the income after flood of the respondents, higher will be assessment about the role of govt. /NGOs in flood rehabilitation” is accepted. Chi-square value (5.75) shows a significant (P=0.05) association between respondents having agricultural land and their assessment about the role of govt. /NGOs in flood rehabilitation. Gamma value shows a negative relationship between the variables. It means if the respondents were having agricultural land then they had less assessment about the role of Govt. /NGOs in flood rehabilitation. So the hypothesis “Landless respondents will be having more assessment about the role of govt. /NGOs in flood rehabilitation” is accepted.

**CONCLUSIONS**

It is clear from the study that floods had adverse impact on the socio-economic status of livelihoods for people in Muzaffargarh district. The study has established that livelihood patterns play an important role in settlement patterns. It was found the floods had negative impact on income and economic sources. Majority of the respondents reported that the damages during flood were severe to irrigation system, housing, agriculture, livestock, transport and communication, education, health, water supply and sanitation and environment. Many problems like unsafe drinking water, food, appropriate health facilities, unavailability of clothes, limited living space, privacy disturbance were found in flood affected areas. Government and non-government organizations (NGOs) will have to play their role in rehabilitation of flood affects in the selected area. These organizations can play their role in housing/shelter, food and the improvement of infrastructure in the flood affected areas.

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