



## An Overview of Damages, Mitigation and Reduction Efforts in District Muzaffargarh, Pakistan after Flood 2010

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### Abstract

*Muzaffargarh is a district in southern Punjab, which is spread over an area of 8,249 square km and it is wedged between the River Chenab on its east and the River Indus on its west. Generally major floods in the Pakistan occur due to heavy monsoon rains. This paper has an overview of the damages, preparedness, and mitigation and reduction efforts in District Muzaffargarh after flood 2010. First the paper summarizes the overall damages of houses, number of people, agriculture, livestock, fisheries, sanitation system and infrastructure due to flood 2010 in district Muzaffargarh. Next to it, this paper describes about the preparedness, mitigation and reduction efforts with important determinants as, Model village rehabilitation program, improve water quality, Sanitation and hygiene promotion programmes. The Government of the Punjab has started the model village rehabilitation programme. The programme has the quality of integrating humanitarian organizations efforts into government flood response. This programme of providing basic facilities like shelter, education, health, communication etc. (Needs assessment report, 28 Dec 2010). In the end the paper provides some recommendations for future strategies in Muzaffargarh District*

**Keywords:** Flood disaster, damages, mitigation, Muzaffargarh District.

### Introduction

Floods are usually considered the most destructive of all natural disasters, but they can be simply defined as the accumulation of too much water in a specific area<sup>1</sup>. There are many kinds of floods, according to the geographical, climatic and hydrological characteristics of the area. Such as seasonal floods, urban floods, flash floods and coastal floods etc<sup>2</sup>. Seasonal floods occur during the summer season in Pakistan due to the monsoon rainfalls and melting of snow which increase the flow of the large river basins of the region, such as Indus River in Pakistan. Consecutive addition of water in the extensive catchment area generates high volumes of runoff, which flow out from the river's natural flood plains<sup>3</sup>.

**District hazards and vulnerability:** Muzaffargarh is an old and prominent district of Punjab province and it is located between 28.57' to 30.46' north and 70.30' to 71.47' east longitude. It is administratively divided into four tehsils, namely Muzaffargarh, Kot Addu, Jatoi, and Alipur. These four tehsils are further divided into 93 Union councils. Muzaffargarh district is situated between two rivers i.e. river Chenab and river Indus. River Indus is situated on the right side of the district with 35km distance from district head quarter and river Chenab lies on the left side with 8km distance away from city. Due to its close proximity to river Indus and river Chenab, the district is prone to heavy flooding during the rainy season. History of the district as witnessed many disasters such as droughts, floods and heat waves etc. But the area of Muzaffargarh district is severely affected by the flood. In rainy season both river overflow and effect the towns, villages and crops in the district River Chenab

is active during the period of mid of July to September where as river Indus from august to October. There is little awareness regarding natural hazards and disasters and people are generally living in vulnerable areas. Harsh climate, poor communications and transport infrastructure makes the district vulnerable in any case of disaster<sup>4</sup>.

**An Over View of Flood 2010 Damages:** Muzaffargarh is one of the worst affected districts in the Punjab province of flood 2010 and certainly the top of the list due to the following estimations.

**Damages to houses during flood 2010:** In Muzaffargarh district most of the houses damaged or nearly washed away during the flood 2010. It has been estimated that nearly 131,293 houses damaged completely, because of flood water. Rest of the houses partially destroyed because of the excessive amount of water.

**Agriculture damages:** The flood 2010 severely affected the crops. As shown in Table 3 below 69% in tehsil Muzaffargarh, 56% in tehsil Kot Addu, 46% in tehsil Alipur and 26% in tehsil Jatoi cultivated area were badly affected by flood<sup>5</sup>. The standing crops of kharif have been affected such as rice, cotton, sugarcane, fodder and vegetables. It has been estimated that nearly one million tons of food and seed stocks destroyed during flood. In district many on-farm water courses and tube wells badly devastated. Flood also severely affected on the forthcoming Rabi crops of the season which are not planted because of the stagnant water in many cultivated areas of the region<sup>5</sup>.

**Table-1**  
**Flood affected tehsils and union councils in Muzaffargarh district**

S.No.	Name of Tehsil	Total number of union councils	Total population 2006	Severely affected UCs(More than 50%)	Moderate Affected UCs(Less than 50%)
1	Muzaffargarh	35	1210864	12	14
2	Kot Addu	28	969084	20	3
3	Alipur	14	484758	4	3
4	Jatoi	16	550243	0	7
Total		93	3214949	36	27

Source: District disaster risk management plan, 2010

**Table-2**  
**Total population affected during flood 2010**

As per census 1998 total population of Muzaffargarh	2.640 million
As estimation(31-12-2009)	3.504 million
Area affected in acres(Non agricultural land)	394,855
Persons affected	2.5 million
No. of deaths	68

Source: Needs assessment report 2010

**Table-3**  
**Number of houses damaged in flood 2010**

Sr. No	Name of Tehsil	No. of houses damaged
1	Muzaffargarh	34,539
2	Kot Addu	71,104
3	Alipur	14,870
4	Jatoi	10,780
	Total	131,293

Source: Needs assessment report 2010

**Agriculture damages:** The flood 2010 severely affected the crops. As shown in table 3 below 69% in tehsil Muzaffargarh, 56% in tehsil Kot Addu, 46% in tehsil Alipur and 26% in tehsil Jatoi cultivated area were badly affected by flood<sup>5</sup>. The standing crops of kharif have been affected such as rice, cotton, sugarcane, fodder and vegetables. It has been estimated that nearly one million tons of food and seed stocks destroyed during

flood. In district many on-farm water courses and tube wells badly devastated. Flood also severely affected on the forthcoming Rabi crops of the season which are not planted because of the stagnant water in many cultivated areas of the region<sup>5</sup>.

**Livestock damages:** Muzaffargarh district is 2<sup>nd</sup> largest district in the province in livestock sector and the source of survival for the people is livestock which includes cows, buffaloes, goats, sheep, donkeys, camels and oxen. An extensive number of livestock have been killed during the flood and it is estimated that more than 50% of livestock was badly affected by the flood of 2010. During flood 5 civil veterinary hospitals and 28 veterinary dispensaries out of total 89 have been damaged.

**Table-4**  
**Total cultivated area affected in District Muzaffargarh by the flood 2010**

Sr.No.	Tehsils names	Total area damaged		% of damage
		Area Sown	Area Affected	
1	Muzaffargarh	183170	126263	69
2	Kot Addu	272974	153435	56
3	Alipur	163585	75819	46
4	Jatoi	163554	42686	26
	Total	783283	398203	50.84

Source: Muzaffargarh district disaster report, 2010

**Table-5**  
**Devastations to different crops production area in district Muzaffargarh in flood 2010**

Tehsil	Cotton		Sugarcane		Rice		Fodder		Vegetables		Others	
	Area Sown	Area Affected	Area Sown	Area Affected	Area Sown	Area Affected	Area Sown	Area Affected	Area Sown	Area Affected	Area Sown	Area Affected
M.Garh	80170	67084	36000	14468	25000	12385	34000	24442	2000	4475	2000	282
Kot Addu	92001	50147	102473	54285	30000	28236	36000	15917	2000	550	2000	600
Alipur	142500	68481	3785	1246	2500	564	10000	2199	1500	454	1500	1445
Jatoi	140829	33770	5525	3390	2500	600	10000	4436	1500	60	1500	30
Total	455500	219482	147783	73389	60000	41785	90000	46994	7000	5539	7000	2357

Source: Muzaffargarh district disaster report, 2010

**Table-6**  
**Number of livestock died during flood 2010**

Sr. No.	Animals	Numbers
1	Sheep	19
2	Goats	66
3	Cow	11
4	Buffalo	7
5	Donkey	5
6	Hens	185
	Total	293

Source: Mohyuddin and Ramzan, 2011

**Fisheries:** Muzaffargarh district is a major source of fish production. Most of the fisheries were badly affected including public and private hatcheries. Fish farms spread over 1700 acre land which completely washed away by the flood water.

**Damages to Infrastructure:** The flood 2010 had a severe affect on the roads and railway network in the district. District government roads, provincial roads and national highway roads were destroyed to some extent. The railway line between railway stations Bud to Memood Kot has completely been washed away. Similarly, breeches have occurred near railway station Kot Addu and DD Panah.

The education sector was badly affected by the flood as well. 52% of the total education facilities in the entire district have been affected by t flood 2010. These damages can be categorise as 74.7 % fully damaged while remain 25.3% partially damaged school buildings in the flood affected areas. The National commission for human development (NCHD) has established 407 feeder schools in the district and out of it 229 have been damaged. Similarly, a number of schools in private sector have also been inundated by the flood water.

After flood many diseases evolved in the area because of the stagnant water and unavailability of medical facilities. The epidemiological report of the district presented that most of the diseases like diarrhoea, dehydration, malaria fever and skin rash occupied the whole area after flood<sup>7</sup>. The medical situation of the district became worst because of the lacking of health facilities, basic health units, doctors availability especially female staff and medicines. During flood out of 71 basic health units 21 were severely destroyed.

Two thermal power stations KAPCO-Kot Addu with capacity of 1600 MW and Lalpir 726 MW were damaged and production suspended. Transmission lines were also devastated badly in two tehsils.

**Damages to Sanitation System:** In Muzaffargarh district around 0.13million households are without facilities of sanitation system. In many areas of the district there is no supply of pure drinking water, only 0.2 million people have an access to safe drinking water through 24 drinking water supply schemes. It is estimation that 36 drainage schemes have been

devastated during flood.

**Flood Relief Measures by the Government, District Government and Agencies:** All the three tiers of Govt, Federal, Provincial and District are engaged in relief activities. Prime minister of Pakistan and federal ministers visited the district and distributed dry ration and other relief goods amongst affectees. Director of Punjab province distributed 10 trucks of dry goods amongst the flood affectees<sup>8</sup>. The district government adopted pre-flood and post-flood measures. The people were rescued and evacuated during flood but due to inadequate resources/equipments, thousands of people became stranded and are still marooned. The district government set up 50 relief camps in \govt schools and buildings for affected people and provided tem shelter and food. According to the statistics released by District Govt, the relief work taken up till 23-08-2010. Te district govt, carrying out survey of damages and loss and a survey committee consisting of village patwari, head master school, member of youth council etc as been constituted.

The livestock department started vaccination of animal and is also distributing Wanda amongst the cattle owners. Similarly 67 camps have been set up in various areas of the districts and 4 mobile dispensaries remain roaming trough out the day. The department treated 576833 animals and distributed 4050 bags of Wanda.

The civil society and individuals also participated in relief work and provided food, shelter, health and water facilities. Many NGOs were evolved in commendable services to the community<sup>9</sup>.

The district government has setup 49 relief camps in various part of the district were as the 22 relief points have been established in government buildings were the affected people are being provide shelter and food. There are 26 dewatering pumps available with district and tehsil government.

**Preparedness and Mitigation Measures by the District Government: Low compensation scenario: Agriculture compensation (crops up to June 2011):** District government provided low agriculture compensation for farmers in district. Farmer with 10ha land will be provided seed, fertilizers and land preparation costs for Rabi crop wheat in upcoming season. The amount would be equivalent to 80 percent of total expenses needed for sowing 1ha of land.

**Livestock compensation (for up to 2 years):** In livestock compensation 2-3 small animals or one large animal will be provided to those who are below the poverty line. This compensation would be 50 percent equivalent of animal losses during flood 2010.

**On-farm water management compensation (up to 2-3 years):** Around 40 percent of the watercourses in Muzaffargarh district will be rehabilitated with proper infrastructure.

**Fisheries compensation (up to 2 years):** For fishing communities around 50 percent of the total recovery needs will be provided in the form of subsidies.

**Medium compensation scenario: Agriculture compensation (crops up to June 2011):** District government provided medium agriculture compensation for such as farmer with 10ha land will be provided seed, fertilizers and land preparation costs for Rabi crop wheat in upcoming season. The amount would be equivalent to 80 percent of total expenses needed for sowing on 3ha of land.

**Livestock compensation (up to 2 years):** In livestock medium compensation 50 percent subsidy given to those, live below poverty line and lost their animals but those living above the poverty line will be compensated for about 30 percent of their lost animals.

**On-farm water management compensation (up to 2-3 years):** Around 60 percent of the watercourses in Muzaffargarh district will be rehabilitated with proper infrastructure.

**Fisheries compensation (up to 2 years):** For fishing communities around 50 percent of the total recovery needs will be provided in the form of subsidies.

**High compensation scenario: Agriculture compensation (crops up to June 2011):** District government give high agriculture compensation for farmers in district. Farmer with 10ha land will be provided seed, fertilizers and land preparation costs for Rabi crop wheat in upcoming season. The amount would be equivalent to 80 percent of total expenses needed for sowing 5ha of land.

**Livestock compensation (for up to 2 years):** In livestock high compensation 50 percent subsidy given to those, live below poverty line and lost their animals but those living above the poverty line will be compensated for about 50 percent of their lost animals.

**On-farm water management compensation (up to 2-3 years):** Around 80 percent of the watercourses in Muzaffargarh district will be rehabilitated with proper infrastructure.

**Fisheries compensation (up to 2 years):** For fishing communities around 50 percent of the total recovery needs will be provided in the form of subsidies.

**Model Village Rehabilitation Programme of Punjab Government in the District Muzaffargarh:** The government of the Punjab has started the model village rehabilitation programme. The programme has the quality of integrating humanitarian organizations efforts into the government flood response. This programme of providing basic facilities like shelter, education, health and communication<sup>10</sup>. The first model village has been constructed in Muzaffargarh district for flood affected. The district authorities have identified 56 sites for

model village within the “model village rehabilitation programme”, out of which 46 sites have been successfully committed for reconstruction of houses by donors from humanitarian agencies. Recent report by UN-OCHA Muzaffargarh and DCO office shows that shelter construction has been started on 28 sites so far while about 90% facilities (both water and sanitation) remain uncommitted. Each house has two rooms, a washroom and a shed for livestock.

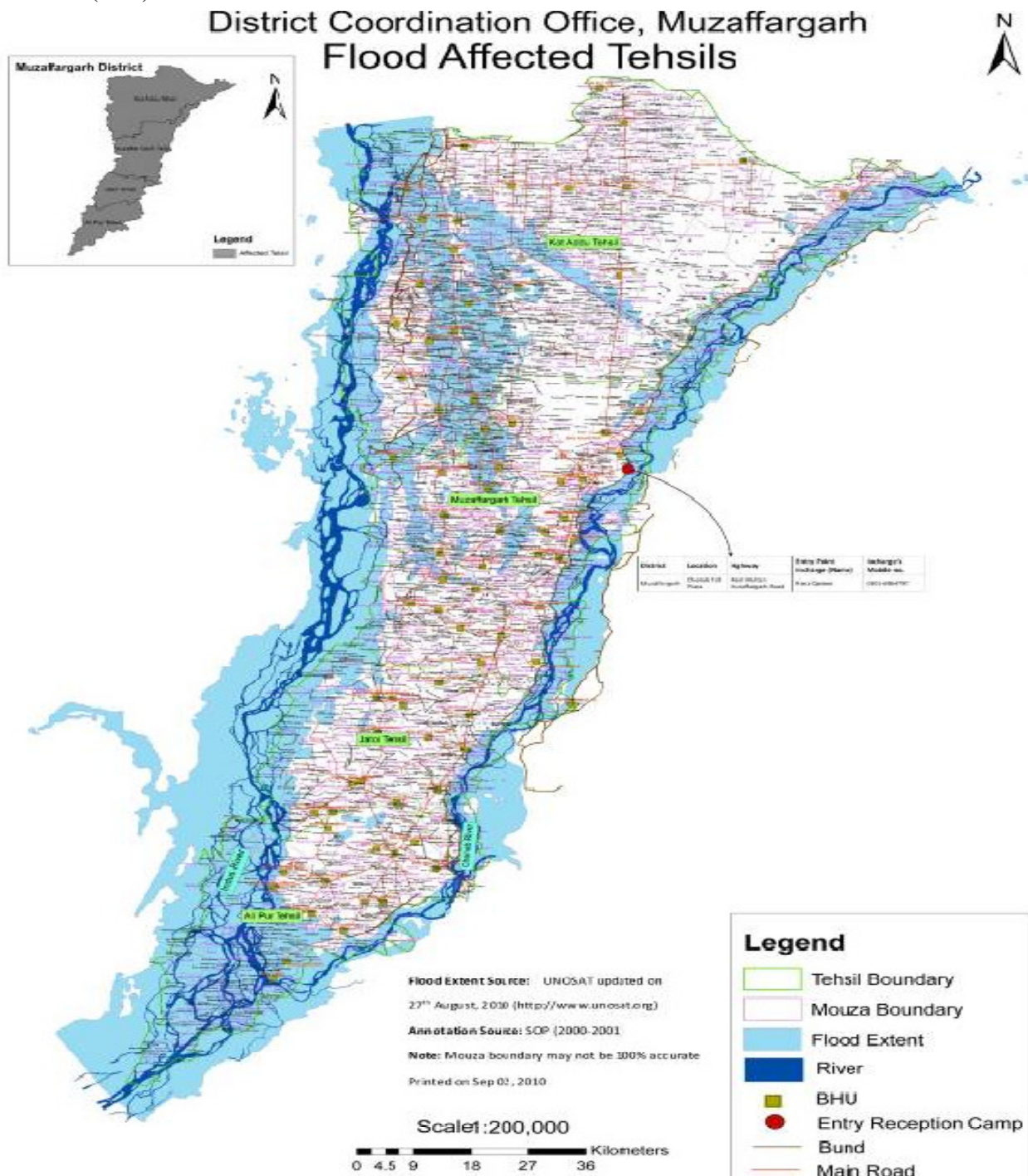
## Conclusion

Paper summarises that Muzaffargarh district is a flood prone area and every year flood devastated a huge area of the district. Flood severely affected the human lives, agricultural land and livestock production in that area. It is a general belief that in flood prone area the casualties are directly proportional to the densities of population. Emergency operational plan should be established for the flood prone area by the district government flood damage prevention measures taken by the individuals' business communities and government. District disaster management department should make the preliminary steps and future mitigation measures to save the area from the flood effects.

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Source: Needs Assessment report, 2010

**Figure-1**  
**Map of the study area**

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