MUZAFFARABAD
District Disaster Risk Management Plan

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Building Enabling Governance and Institutions for Earthquake Response (BEGIN-ER)

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Acronyms

AC	Assistant Commissioner
AD	Assistant Director
ADB	Asian Development Bank
AKDN	Aga Khan Development Network
AJ&K	Azad Jammu & Kashmir
CBDM	Community Based Disaster Management
CBO	Community Based Organization
CD	Civil Defence
DC	Deputy Commissioner
DDMA	District Disaster Management Authority
DEOC	District Emergency Operations Centre
DFO	District Forest Officer
DM	Disaster Management
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DRU	District Reconstruction Unit
EOC	Emergency Operations Centre
ERC	Emergency Relief Cell
ERRA	Earthquake Reconstruction and Rehabilitation Authority
EWS	Early Warning System
GoP	Government of Pakistan
GSP	Geological Survey of Pakistan
HVCA	Hazard Vulnerability and Capacity Assessment
IDB	Islamic Development Bank
IHK	Indian-held Kashmir
INGO	International Non-Governmental Organization
IOM	International Organization for Migration
JICA	Japan International Cooperation Agency
LG&RD	Local Government & Rural Development
NDMA	National Disaster Management Authority
NDMC	National Disaster Management Commission
NDMO	National Disaster Management Ordinance

NESPAK	National Engineering Services Pakistan
NGO	Non-Governmental Organization
OCHA	Organization for Coordination of Humanitarian Affairs
PAK	Pakistan Administered Kashmir
PC-1	Planning Commission (Form)-1
PKR	Pakistani Rupees
PMD	Pakistan Meteorological Department
PRCS	Pakistan Red Crescent Society
SERRA	State Earthquake Reconstruction and Rehabilitation Authority
SOPs	Standard Operating Procedures
SSP	Senior Superintendent of Police
SW&WD	Social Welfare & Women Development
SUPARCO	Pakistan Space and Upper Atmosphere Research Commission
UC	Union Council
UNDP	United Nations Development Program
WAPDA	Water and Power Development Authority
WB	World Bank

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Foreword

The devastating earthquake of October 2005 brought about an acute awareness among government institutions and communities of the critical need for disaster risk management. As part of the joint UN response to earthquake relief and recovery, the United Nations Development Programme (UNDP) supported the Government in restoring the operations of local government institutions for the planning and implementation of recovery activities through the "Building Enabling Governance and Institutions for Earthquake Response (BEGIN-ER)" project in the affected districts of North West Frontier Province (NWFP) and Pakistan Administered Kashmir (PAK). It was during the implementation of the capacity building component of this project that government officials, elected local representatives, community based organizations, and national and international NGOs identified the need for developing District Disaster Risk Management Plans.

Meanwhile, the Government of Pakistan promulgated the National Disaster Management Ordinance in December 2006. The Ordinance provides for a coherent disaster risk management system through the establishment of National Disaster Management Commission (NDMC) and National Disaster Management Authority (NDMA). It also calls for instituting similar bodies at the provincial and district levels. The NDMA has been established to ensure that appropriate policies, strategies and programmes for risk management are developed and implemented to reduce disaster risks in a proactive, organized and effective manner.

Considering these national level developments and the needs expressed by local authorities, UNDP engaged national and international planning experts to develop disaster risk management plans for the districts of Muzaffarabad, Neelum, Rawalakot, and Bagh in Pakistan Administered Kashmir (PAK). During the process, they conducted a series of bilateral meetings and had consultations with the district administration officials and civil society representatives. Based on review of the secondary data and consultations, draft plans were prepared, which were presented in district level stakeholder workshops for final comments. The plans were also shared with Earthquake Reconstruction and Rehabilitation Authority (ERRA) and we are grateful especially to Lieutenant General Nadeem Ahmed for his valuable inputs to finalize and endorse the district plans.

I am glad to present the District Disaster Risk Management Plan (DDRMP) of district Muzaffarabad, which has been developed with a primary objective of saving lives, properties and infrastructure of the district from existing and future natural and human-induced hazards. The Plan consists of three sections: a) profile of district Muzaffarabad; b) risk assessment and current response; and c) disaster risk reduction strategy, structures and roles of stakeholders in disaster risk management; and recommended readings on the subject.

I am grateful to our experts Mr. Zorobabel Zuniga and Mr. Iqbal Haider Butt for putting together their efforts in producing the Plan. For guiding the planning process we are thankful to Mr. Mohammad Zafar Iqbal, Mr. Zubair Murshed and Mr. Irfan Maqbool. Thanks are also due to Ms. Shaista Hussain, Mr. Tariq Rafique and Mr. Usman Qazi for review and editing of the plan, and Ms. Asma Rashid and Ms. Jamila Sikander Khan for the copy editing. The preparation of this document and publishing has been made possible with support from United Nations secretariat of the International Strategy for Disaster Reduction (UN-ISDR).

The production of District Disaster Risk Management Plan is only a first step towards achieving the broader objective of reducing disaster risks. We hope that the government of PAK would extend all possible support to the District Administration through the establishment of the District Disaster Management Authority and provision of resources for the implementation of this plan.

Mikiko Tanaka
Acting Country Director
UNDP Islamabad

Message from Deputy Chairman ERRA

In the post-earthquake phases of emergency relief, early recovery, rehabilitation of the affected populace, and the on-going process of reconstruction in NWFP and Azad Jammu & Kashmir, the United Nations Development Programme - Pakistan has so far played a commendable role through its continuous support to the Earthquake Reconstruction and Rehabilitation Authority (ERRA).

Most significantly, the BEGIN-ER (Building Enabling Governance and Institutions for Earthquake Response) project has been a great success in terms of providing critically needed prefabricated offices to the local government institutions in the most affected districts and enhancing capacities of elected representatives, government officials, and community based organizations for an effective and integrated response to the earthquake disaster.

I am glad that under the training component of the BEGIN-ER project, UNDP has been able to produce District Disaster Risk Management Plans for Muzaffarabad, Rawalakot, Bagh and Neelum districts in AJ&K and Abbottabad, Battagram, Shangla and Mansehra districts in NWFP.

I congratulate Mr. Mohammad Zafar Iqbal, Assistant Resident Representative, UNDP and his team for such a tangible and timely output. It is expected that these plans can be used as guidelines for development of plans by National Disaster Management Authority for other districts of Pakistan.

The ERRA, on its part, would extend all possible assistance to the district governments for successful implementation of the disaster risk management plans in due course of time. Additionally, the planning guidelines and framework would also be shared with other district governments in Pakistan to be followed during the future development discourse.

I am confident this initiative would lead towards achieving the overall objective of making communities more resilient against future hazards and putting the country on the path of integrating disaster risk reduction into development plans, ensuring sustainable development.

Lieutenant General Nadeem Ahmed
Deputy Chairman, ERRA

Introduction

The destruction and devastation caused by the October 2005 earthquake has diverted global attention to Pakistan in general and Pakistan Administered Kashmir (PAK) in particular[1]. The level of direct damage is higher in PAK than in NWFP. For PAK, it amounts to PKR 76.4 billion (US$1.3 billion) and for NWFP, PKR 58.7 billion (US$989 million). In most sectors, the monetary value of destruction of physical assets in PAK exceeds comparatively in NWFP[2].

Assistance to PAK started from emergency response and has entered into the rehabilitation and construction phase today. The Pakistani government, with the help of the UN system and other countries, has also established the policies and procedures to guide the reconstruction process.

Among the government agencies in the forefront are the Earthquake Rehabilitation and Reconstruction Authority (ERRA) and the recently formed National Disaster Management Authority (NDMA).

The development of the Muzaffarabad District Disaster Risk Management Plan, hereafter called the Plan, is part of this undertaking and has been developed with support from the BEGIN-ER project, which is being implemented by UNDP. This plan is the result of an extensive literature review, series of meetings with various officials in Muzaffarabad, consultative workshop with stakeholders and technical review by Disaster Management experts.

The Plan will guide initial operationalization of the District Disaster Management Authority (DDMA) until such time that it is able to function on its own. The Plan will also guide in identifying risks and hazards in district Muzaffarabad and as to what activities are most urgent and need immediate implementation.

The Disaster Risk Management Plan for district Muzaffarabad is composed of three (3) chapters:

1. **Profile of District Muzaffarabad** is a brief introduction to the area. It provides basic information about the location, administrative areas and divisions, salient physical features and land-use patterns, climate and rainfall, socio-economic features and population, and the scale of public services and resources (i.e. health, education, roads, power, etc.) available to the district populace. This section sets the geographical context of Disaster Risk Management planning for district Muzaffarabad.

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[1] Azad Jammu and Kashmir (AJ&K) is the national designation, while the official designation of the UN for Kashmir is Pakistan Administered Kashmir (PAK)

[2] ADB /WB, *Preliminary Damage and Needs Assessment*, November 2005.

2. Risk Assessment and Current Responses in the District prioritizes risks and hazards being faced by the district. While using a qualitative matrix, this section is developed by scientific research and participatory approaches to map out which hazards affect the district most in order of both likelihood and consequences. The planning consultants have traced patterns of occurrences of disasters i.e. landslides, earthquake, floods, etc. This section highlights and prioritizes localized problems and disaster risks of the district Muzaffarabad; so that appropriate strategies are adopted to minimize these risks.

3. Strategy for Implementation of the District Disaster Risk Management Plan delineates principles of social vulnerability. This section is further divided into two sub-sections (i) the institutional mechanism for District Disaster Risk Management, specifically the structure of DDMA, and (ii) implementation activities/ targets to be achieved by the DDMA for immediate and mid-term periods. This section proposes DDMA's structure, functions and implementation process.

Purpose and Scope of the Plan

The Muzaffarabad District Disaster Risk Management Plan is conditioned by the following objective:

- The Plan aims to guide the establishment and operationalization of the District Disaster Management Authority Muzaffarabad in terms of structure, strategy and activities and will provide implementation agenda for the medium term (3 years).

Planning Process

The following steps were undertaken in the crafting of the District Disaster Risk Management Plan:

1. Review of existing documents on the disaster situation, present activities in rehabilitation and reconstruction, and the pertinent documents relevant to the National Disaster Management Framework at the UNDP office in Islamabad. *(See Bibliography given at the end of the Plan)*
2. Information gathering at field level through bilateral meetings with district officials, some NGO and local residents. (For details see *Annex VIII Bi-lateral meetings for the development of Muzaffarabad District Disaster Risk Management Plan*)
3. Impressions were taken through site visits, visual inspection, observations, photography, and discussions with affected people, officials and field staff of aid agencies
4. Review of information gathered and Plan drafting
5. Sharing of draft Plan with stakeholders through a consultative workshop in Muzaffarabad

6. Revision of the Plan and internal review
7. Consultation with ERRA and endorsement of draft plans
8. Finalization of the Plan

SECTION 1:

Profile of District Muzaffarabad

1.1. Location

Muzafarabad district is situated at the latitude of 34-35.8, longitude of 73.7 - 74 and altitude of 3,000 feet on the banks of the Jhelum and the Neelum Rivers.

It borders on the East with Indian Administered Kashmir, to the South with District Bagh, to the West with District Abbotabad, to the North-West with District Mansehra, and to the North with the District Neelum.

Muzaffarabad is the main city and is also capital of the PAK. It is situated at a distance of 138 kilometers from Rawalpindi and Islamabad, and about 76 kilometers from Abbottabad. It became a district headquarter approximately 80 years ago. A Town Committee in 1938, it was upgraded as Municipal Committee in 1960 and a Municipal Corporation in 1990.

1.2. Area and Divisions

Total area of the district Muzaffarabad is 2449 sq kms. Total population according to 1998 census, was 0.746 million and was projected for year 2006 as 0.88 million. But now this has decreased after the separation of Neelum valley as an independent district in 2005. The average population density is 210 persons per sq. km at an annual growth rate of 2.90.

District Muzaffarabad is divided into two tehsils, Muzaffarabad and Hattian, which contain one Municipal Corporation, one Town Committee, 38 Union Councils, 528 villages inhabited by 106338 households.

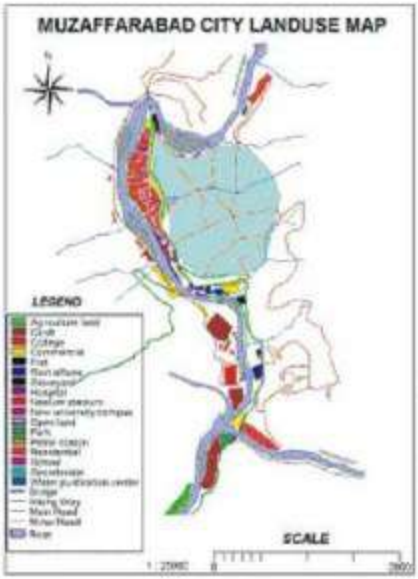
1.3. Salient Physical Features and Land Use Patterns

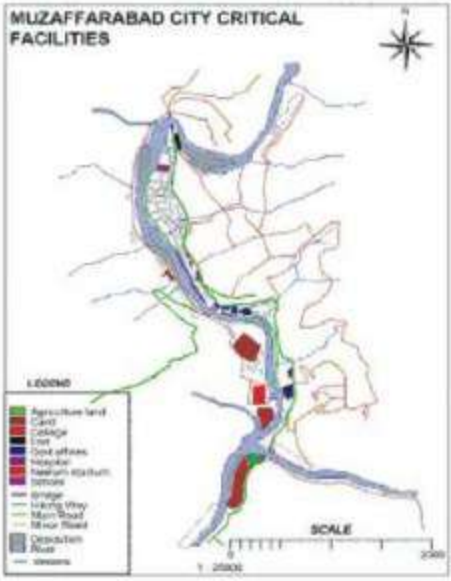
District Muzaffarabad is generally hilly and mountainous and can broadly be categorized as:

i. Mountain plateaus
ii. Mountain slopes
iii. Inter-mountainous valleys

Much of this area is highly eroded and is characterized by deeply cut ravines and undulating hilly terrain.

As regards to the city of Muzaffarabad, its land use map reveals that residential areas are predominantly situated at the riverbank.





The map also shows that there is severe lack of land use planning. For example, thickly populated residential area of the Muzaffarabad city, the lower plate, the culturally rich much of the cantonment area, and the confluence of River Neelum and Jhelum, Domel, which is a high class commercial locality, all are situated at the riverbank[3].

This pattern can be further witnessed in mushroom growth of narrow and unplanned residential streets on the sloppy terrain of the city that caused much of the urban causalities during the October 2005 earthquake by way of domino effect; in that roofs upon roofs triggered a series of construction collapse and consequently took lives of the citizens in Muzaffarabad city.

[3] Falak Nawaz & Mohammad Shafique, *Data integration for flood risk analysis by using GIS/RS as tools*, 2005. http://www.gisdevelopment.net/application/natural_hazards/floods/ma03032.htm

The district has a forest cover of 218,168 acres at the rate of 37% for whole of Muzaffarabad. The predominant species of tree found are deodar, blue pine, spruce, chir, walnut, ash, maple, poplar, willow and oak.

1.4. Climate and Rainfall

The climate varies considerably in the north and in the south. The southern part of the district experiences warm summer and cold winter whereas in the north summer is cool and winter extremely cold. June, July and August are the hottest months. The mean maximum and minimum temperature during the month of July are about 35 and 23° C respectively. December, January and February are the coldest months. The average temperature in district Muzaffarabad ranges from 25° C to 42° C in summer and between -3° C to 15° C in winter. Average annual precipitation of the district is 1511 millimeters.

1.5. Socio-Economic Features

According to the 1998 census, the demographic features observed in district Muzaffarabad are as follows:

Total number of households:	106338
Total Population:	746000
Total Male Population:	51 %
Total Female Population:	49 %
Population density:	210 per sq km
Literacy Rate:	46.95 %

Socially speaking, different tribes and clans are settled in the district i.e, Rajput, Jat, Gujjar, Mughal, Syed, Awan, Khawaja etc. In Muzaffarabad city, there are also a sizeable number of families originally coming from PAK and parts of the Indian-held Kashmir valley.

1.6. Public Services and Resources

As for public services and resources, a total of 76689 consumers (Domestic: 68475, Commercial: 7868, Industrial: 346) are using electric power resources in district Muzaffarabad.

In terms of water resources, district Muzaffarabad is in the catchment area for the Jehlum and Neelum Rivers. These water courses are part of the greater Indus basin catchment area. The Jehlum River is the main waterway of Kashmir. The Jhelum and Neelum rivers are relatively rapid-flowing, and they are responsible for moving vast quantities of alluvial matter downstream. The district has no major irrigation system.

The district has a network of 2205 km roads within its boundary, which includes metalled (904 km) and link roads (1301 km). There are 69 health units and 1312 schools in district Muzaffarabad.

SECTION 2:

Risk Assessment and Current Responses

The consultation in Muzaffarabad undertaken by the BEGIN - ER project on the draft District Disaster Risk Management Plan has resulted in prioritization of risks faced by the area. In this deliberation, the stakeholders prioritized landslide as first, earthquake as second and flood as third hazard, which calls for immediate attention of District Disaster Management Authority.

The main considerations for the prioritized list of hazards were the likelihood of occurrence, the consequences of the hazard and the current responses. [For details of the criteria to determine the severity of a hazard, please see *Annex VII: Matrix for Prioritization of Hazards*]

In Muzaffarabad, landslide is a frequently occurring hazard intensified by the effects of the earthquake. Rains trigger landslide events which result in deaths and destruction of properties. We have recently witnessed this combination and its fatal effects during first quarter of 2007. During the summer season when snow melts and during the monsoon season landslide becomes a routine occurrence. There is a pressing need to control/mitigate this hazard that is causing deaths and destruction on regular basis.

The earthquake is put second on the hazards list. The casualties and damages caused due to the collapse of poorly constructed structures in earthquake 2005 calls for the immediate and serious attention of the authorities. Constructing earthquake resistant structures following proper building codes and preparedness activities is mandatory.

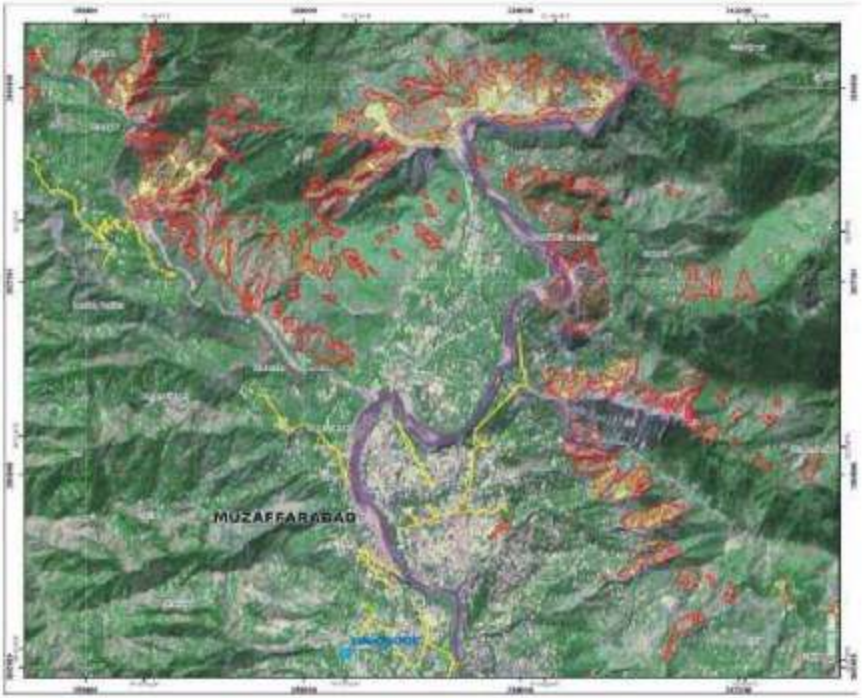
The hazard of flood is put third in the list of priority hazards. A review of the destruction caused in Muzaffarabad in 1992 and a recall of the flood waters rampaging causing death and destruction to those in the flood plain puts flood on third number on the prioritized list of hazards.

There were concerns raised regarding deaths caused due to vehicular accidents. Deaths due to vehicular accidents, when added together in a span of time may equal the devastation caused by a hazard that occurs once in fifty years. Furthermore, there is very little activity undertaken for this event to reduce fatalities.

2.1. The Landslide Situation

Muzaffarabad faces the risk of landslides which has been worsened after the earthquake. In fact right from the north-western to north-eastern parts of the district, making a huge curve all along the location, landslides have either been there or reactivated after the earthquake. The vast belt of landslides ranges from and around Kanah, Thangar, Shawal, Chahia, Dhanni, Bandi Mir Sumdani, Barbala, Sherwan, and Dhammanjhol areas.

With pressure on land, many vacant sites on hill slopes or bottoms of hills have turned into inhabited area and thereby become vulnerable to landslides. Based on the experiences of the residents near these landslide-prone areas, they have observed an increase in the frequency of landslides after the earthquake of 2005.



Source: SERTIT UNOSAT, Red circles are showing sites of newly detected landslides while the brownish ones locate sites of reactivated landslides. Continuous yellow lines display roads/ trails. The broken yellow lines decipher probable roads/ trails.

Muzaffarabad Landslide Study of the Durham University states that:

Across the whole of the affected area there are vast numbers of tension cracks extending across the slopes for hundreds of metres. Many of these clearly define incipient landslides. Most were creeping at the time. These are feared to be activated during heavy rains especially the monsoon season. In addition to the rock and soil slopes there was also extensive collapse of the old uplifted terrace edges. Often structures have been constructed that use the slope of the edge of the terrace.

Shallow rockslides have been triggered on the steeper slopes, especially where cutting has been undertaken as a result of road construction. These slides are now causing major problems for communication. (For details see *Annex II*)

Discussions with local government officials indicate that landslide is a critical hazard risk. In Muzaffarabad city, the landslide over the Shuwai area is a critical matter of concern for the local inhabitants. According to the rough estimates of the local forest department officials this hill can completely slide downwards within a period of 2 years and during heavy rains the process might pace fast to cause greater damages mostly to human lives and residential areas in the town. However, scientific study and further field work is needed to validate this observation that's also shared almost daily by thousands in Muzaffarabad. In 2006, in the forest area of union council of Lippa a cloudburst caused a landslide that buried 12 people whose homes were in the lower part of the mountain.

From the news reports below, the landslide events are reflected as regular occurrence resulting in death and destruction of varied intensities.

> ***July 27, 2006:*** *Key road links in Azad Kashmir were blocked by landslides Wednesday prompted by the recent spate of monsoon incessant rains, obstructing movement of the people. Heavy downpour which began Monday and caused landslides, cuting off the scenic Neelum valley's only link with Muzaffarabad, the capital of Azad Kashmir. Army and civil engineers teams were busy clearing the landslides but rain was hampering the efforts, an ISPR spokesman reported. Some 10,000 survivors had been shifted to safer locations away from landslide-prone areas. Twelve people who survived last year's major earthquake in the area were killed in a landslide at a camp on Monday near Muzaffarabad.*
>
> ***Feb 25, 2007:*** *Thirteen (13) bodies were recovered and five seriously wounded people were also pulled out.*
>
> ***March 24, 2007:*** *In Dhoba Syedian of Jehlum valley area of Azad Kashmir, Pak Army rescue team recovered 10 bodies from the mud-slide so for where as 18 corpses were still under the slide. 15 injured were rescued and were flown through four Helicopter sorties to CMH and Abbas Institute of Medical Sciences (AIMS) hospital Muzaffarabad for treatment. (Pakistan Times, Kashmir Desk)*
>
> ***March 2007:*** *Muzaffarabad: At least 30 people died when a landslide hit two homes in Doba Sayedan, a remote village in the mountainous Himalayan territory, a spokesman in Muzaffarabad said. (Pakistan Times, Kashmir Desk)*

The Government of Pakistan through ERRA conducted a study of PAK landslides and for Muzaffarabad the table below shows the landslide areas and the priority category for attention. The tables also show that there is an existing target list which guides the government in dealing with the physical aspects of the landslide hazards.

16	Sehri Bawli	681149/Mzd-Chkthi	JVR	600	5	3000	Debris	Slide	–	Active	Y	Y	-	Y	-	-
17	Hatian Bala	738140/Mzd-Chkthi	JVR	1200	8	9600	Debris	Slide	–	Active	Y	Y	-	Y	-	-
18	Kuchan	748142/Mzd-Chkthi	JVR	41	6	246	Debris	Slide	–	Active	Y	Y	-	Y	-	-
19	Kuchan	753142/Mzd-Chkthi	JVR	60	6	360	Rock	Slide	–	Active	Y	Y	-	Y	-	-
20	Jhelum Valley	754141/Mzd-Chkthi	JVR	100	20	2000	Debris	Slide	–	Active	Y	Y	-	Y	-	-
21	Jhelum Valley	648159/Mzd-Chkthi	JVR	22	4.5	99	Debris, Rock	Slide, Fall	–	Dormant	Y	-	-	Y	-	-
22	Jhelum Valley	672145/Mzd-Chkthi	JVR	10.5	3.5	36.75	Rock, Debris	Slide	–	Inactive	Y	-	-	Y	-	-
23	Jhelum Valley	672145/Mzd-Chkthi	JVR	10.5	3.5	36.75	Debris	Fall	–	Inactive	-	-	-	Y	-	-
24	Darang/Bandi Syedan	829105/Mzd-Chkthi	JVR	600	10	6000	Rock, Debris	Slide, Fall	–	Dormant	Y	Y	-	Y	-	-
25	Darang/Naka	836097/Mzd-Chkthi	JVR	20	1	20	Debris	Slide	–	Inactive	Y	-	-	Y	-	-
26	Jhelum Valley	859075/Mzd-Chkthi	JVR	800	10	8000	Rock, Debris	Slide, Fall	–	Dormant	Y	Y	-	Y	-	-
27	Chakothi	864074/Mzd-Chkthi	JVR	600	9	5400	Rock, Debris	Slide	–	Dormant	Y	Y	-	Y	-	-
28	Chinari	812116/Mzd-Chkthi	JVR	120	15	1800	Debris	Slide, Fall, Flow	–	Active	Y	Y	-	Y	-	-
29	Jhelum Valley	802125/Mzd-Chkthi	JVR	100	8	800	Rock, Debris	Slide, Fall, Flow	–	Active	Y	Y	-	Y	-	-
30	Jhelum Valley	788132/Mzd-Chkthi	JVR	28	3	84	Debris	Fall, Flow	–	Active	Y	Y	-	Y	-	-
31	Jhelum Valley	783135/Mzd-Chkthi	JVR	25	10	250	Rock, Debris	Fall, Flow	–	Active	Y	Y	-	Y	-	-

32	Kuchan	752143/Mzd-Chkthi	JVR	125	15	1875	Debris	Slide, Fall	–	Active	Y	Y	-	Y	-	-
33	Sawan	749142/Mzd-Chkthi	JVR	170	35	5950	Debris	Fall, Flow	–	Active	Y	Y	-	Y	-	-
34	Sawan	767141/Mzd-Chkthi	JVR	1000	11	11000	Rock	Slide, Flow	–	Active	Y	Y	-	Y	-	-
35	Sawan	782143/Mzd-Chkthi	JVR	20	3	60	Debris	Slide, Flow	–	Active	Y	Y	-	Y	-	-
36	Chinari	788132/Mzd-Chkthi	JVR	50	6	300	Debris	Slide	–	Dormant	Y	Y	-	Y	-	-
37	Jhelum Valley	792130/Mzd-Chkthi	JVR	150	6	900	Debris	Slide	–	Dormant	Y	Y	-	Y	-	-
38	Chinari	795129/Mzd-Chkthi	JVR	200	6	1200	Rock, Soil	Slide	–	Dormant	Y	Y	-	Y	-	-
38	Chinari	7991227/MzdChkthi	JVR	600	10	6000	Rock, Debris	Fall	–	Dormant	Y	Y	-	Y	-	-
49	Chinari	812115/Mzd-Chkthi	JVR	150	6	900	Debris	Slide	–	Active	Y	Y	-	Y	-	-
41	Faisal Hotal	23-24/15	JVR	150	60	9000	Soil	Slide	–	Active	-	-	Y	Y	-	-
42	Faisal Hotel	29-30/13	JVR	25	40	1000	Soil	Slide	–	Active	-	Y	-	Y	-	-
43	Faisal Hotel	25/24 KM	JVR	1000	60	60000	Soil	Slide	–	Active	-	-	Y	Y	-	-
44	Sanavi	13KM/CMH Rd	JVR	118	25	2950	Soil	Slide	–	Active	-	-	Y	Y	-	-
45	Bandi Karim Haider	7/Airport-Hotreri	Mzd	64	40	2560	Debris	Fall	–	Active	Y	Y	Y	Y	-	-
46	Dhun Chhattar	9.2/Airport-Hotreri	Mzd	80	50	4000	Rock	Slide	–	Active	Y	Y	Y	Y	-	-
47	Airport-Hotreri Road	15.4/Airport-Hotreri	Mzd	128	20	2560	Rock	Fall	–	Active	Y	Y	Y	Y	-	-
48	Hotreri	17.8/Airport-Hotreri	Mzd	200	300	60000	Rock	Fall	–	Dormant	Y	-	-	Y	-	-

(Priority-II)

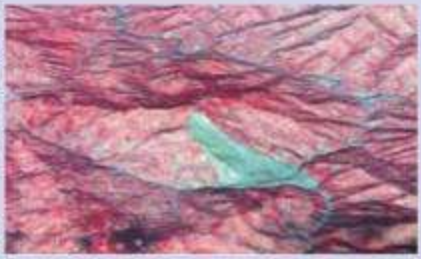
S/No	Location		Measurements				Features				Causes			Damage		
	Vill/Town	KM/Road	Valley /City	Length (m)	Height (m)	Area (Sqm)	Material	Type	Previous Movement	Present Status	E/Q 8 Oct	Rain	Erosion	Road Block	Res	Nullah Block
1	Manak	1.3/Airport-Hotreri	Mzd	25	70	1750	Debris	Fall	-	Dormant	Y	Y	Y	Y	-	-
2	Airport-Hotreri Road	13.7/Airport-Hotreri	Mzd	50	150	7500	Rock	Flow	-	Active	Y	Y	Y	Y	-	-
3	Airport-Hotreri Road	Airport-Hotreri	Mzd	45	120	5400	Rock	Fall	-	Active	Y	Y	Y	Y	-	-
4	Airport-Hotreri Road	16/Airport-Hotreri	Mzd	100	100	10000	Rock	Flow	-	Active	Y	Y	Y	Y	-	-
5	Jhelum Valley	645157Mzd-Chkthi	JVR	23	4.5	103.5	Rock	Fall, Slide	-	Dormant	Y	Y	-	Y	-	-
6	Jhelum Valley	636164/Mzd-Chkthi	JVR	10	2.5	25	Rock	Slide, Fall	-	Inactive	Y	-	-	Y	-	-
7	Jhelum Valley	578218/Mzd-Chkthi	JVR	7	2.5	17.5	Rock	Slide, Fall	-	Inactive	Y	-	-	Y	-	-
8	Jhelum Valley	564228/Mzd-Chkthi	JVR	8	3	24	Rock	Fall, Topple	-	Inactive	Y	-	-	Y	-	-
9	Jhelum Valley	552251/Mzd-Chkthi	JVR	7	2.5	17.5	Rock, Debris	Slide,Fall	-	Dormant	Y	-	-	Y	-	-

(Priority-III)

#	Location		Measurements				Features				Causes			Damage		
	Vill/Town	KM/Road	Valley /City	Length (m)	Width (m)	Area (Sqm)	Material	Type	Previous Movement	Present Status	E/Q 8 Oct	Rain	Erosion	Road Block	Res	Nullah Block
1	Khori-Patika-Deolian Rd	38/ Khori-Deolian	NVR	130	25	3250	Debris	Slide	Nill	Dormant	Y	-	-	Y	Y	-
2	Bandi Karim Haider	6.8/Airport-Hotreri	Mzd	75	45	3375	Debris	Fall	-	Dormant	Y	Y	Y	Y	-	-
3	Bandi Karim Haider	7/Airport-Hotreri	Mzd	56	30	1680	Debris	Fall	-	Dormant	Y	Y	Y	Y	-	-
4	Ghun Chattar	11.1/Airport-Hotreri	Mzd	35	50	1750	Rock	Fall	-	Dormant	Y	Y	Y	Y	-	-
5	Airport-Hotreri Road	16.2/Airport-Hotreri	Mzd	100	40	4000	Rock	Fall	-	Dormant	Y	Y	Y	Y	-	-
6	Airport-Hotreri Road	16.3/Airport-Hotreri	Mzd	72	325	23400	Rock	Fall	-	Dormant	Y	-	-	Y	-	-
7	Shala Bagh	9/Lungerpura-Dabn	Mzd	90	30	2700	Debris	Slide	Once	Dormant	Y	-	-	Y	-	-

Special Concern - Hattian Landslide

Hattian landslide is the largest landslide area in the world triggered by the earthquake. This landslide, triggered by the earthquake, is 2.5 kms length and 1.0 km in width. It has also been forming two lakes here: one, 200 ft wide, 50 ft deep - in Nalla Tang, and the other one 337ft wide 80 ft deep in Nalla Karli. Professor David Petley and Dr. Mark Bulmer, two experts from International Landslide Centre, University of Durham (UK), and Landslide Observatory, University of Maryland - Baltimore County (USA) consider that the threat posed by this site is severe, and the consequences of a failure of an artificial dam that this landslide had created could be a second potential large-scale disaster in AJ&K[1]. They strongly recommended undertaking an assessment immediately and insisted on detail mapping, monitoring and evaluation of the landslide.



The ERRA in cooperation with the NESPAK and the Geological Survey of Pakistan has completed a technical study of the Hattian landslide problem and has come up with six (6) options. These are: blasting, pumping, siphoning, outlet tunnel, structural spillway, and open cut spill way.

Presently, there is a team to monitor the developments in the Hattian landslide dam as the actual option is chosen and executed to solve the threat of a flash flood from the debris dam in Hattian.

A potential threat is the possibility of a landslide due to a cloudburst or earthquake that will upset the existing balance in the landslide dam and cause the break in the dam before a permanent solution is implemented. An earthquake of M6 has occurred on Tuesday, April 3, 2007 with its epicentre estimated about 100 km north of Peshawar. No harm has been done so far. However, the study of the Dr. D. Petley of Durham University has concluded that the earthquakes in the Himalayan mountains have always affected each other is enough warning to be already implementing both the temporary and permanent solutions for the Hattian landslide dam threat.

Major General Shaukat Sultan, the Director General of the Inter Services Press Relations (ISPR), informed journalists in Dec. 2005 that three or four such events [dam creation] have also developed along the Neelum River following the October earthquake[2].

Seven highly vulnerable locations with unstable slope conditions were identified during a risk assessment survey done by Aga Khan Development Network's (AKDN) together with Pakistan's National Engineering Services (NESPAK) in June 2006, ahead of monsoon rains. It recommended that housing related prospects for residents of these areas needed to be urgently considered by authorities.

Following the assessment, about 900 families from 23 landslide-prone villages in the suburbs of Muzaffarabad were moved to makeshift tented camps for their own safety. The AKDN/NESPAK survey also found that there had been a drastic increase in the degradation of slope conditions since last year. In several areas, wide, open fresh cracks appeared within the steep upper slopes, whereas in others dormant cracks have been activated.

John Sampson, head of the International Organization for Migration's (IOM) sub-office in Muzaffarabad, said that they had urged authorities "to carry out a technical study to identify landslide risk areas and relocate vulnerable families to safe places to minimise the risk of any future disaster".

"In our opinion, such an assessment should be done as soon as possible, [preferably] pre-monsoon because vulnerability is likely to increase during this time," AKDN's Programme Manager Shireen Issa said in a statement[3].

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[1] See: International Landslide Centre / Landslide Observatory Open File Report 06-01, Brief Report, Landslide issues requiring attention

[2] 8th October 2005 earthquake affected areas, northern Pakistan, February 2006.

[3] http://www.presidentofpakistan.gov.pk/NewsEventsDetail.aspx?NewsEventID=2725

2.1.1. Settlements and Structures

All residential and farm structures located in the areas mentioned by the SERTIT UNOSAT landslide mapping of district Muzaffarabad face the threat of complete or partial destruction with deaths and injuries to the occupants and residents of these areas.

2.1.2. Lifelines

In the past, most cases of landslides occurred during heavy rain associated with high velocity winds. It sometimes resulted in loss of human lives and damage to structure. After the 2005 earthquake, landslides have become more frequent in some areas while the threat of major slides is present along the main highway connecting Muzaffarabad to Pakistan, an observation shared by the Head of the Forest Department. Some water sources are also within the landslide-prone areas. The exact locations are reported by the district's department of Local Government and Rural Development.

The Public Works Department and the Pakistan Army are engaged in the repair and rehabilitation of the highways and roads affected by road slips and road cuts due to the landslides, clearance of debris from roads and construction of retaining walls on unstable slopes. Some NGOs are engaged in bio-engineering for slope stabilization.

As noted in many studies, some of the school buildings were located near areas where landslide occurred. However, the majority of school buildings collapsed due to the shaking of the land during the earthquake. The exact numbers and location are contained in the report of the district's department of Education.

2.1.3. Population and other At-risk Elements

The existing number of people living in these threatened areas will have to be identified through actual survey because the delineation of the threatened areas is not accurate in the existing study done by national agencies on the 66 potential and actual landslide sites in Muzaffarabad. The survey should also determine the farm animals that are also threatened by the landslide hazard.

2.2. The Earthquake Situation

The Earthquake 2005 (also known as the South Asia earthquake or the Great Pakistan earthquake), was a major earthquake, of which the epicenter was the Pakistan Administered Kashmir. The earthquake occurred at 08:50:38 Pakistan Standard Time (03:50:38 UTC) on 8 October 2005. It registered 7.6 on the richter scale making it a major earthquake similar in intensity to the 1935 Quetta earthquake, the 2001 Gujarat Earthquake, and the 1906 San Francisco earthquake. The earthquake occurred in a region where a great plate-boundary earthquake has long been considered overdue. (For details on the 2005 earthquake, see *Annex I: Kashmir Earthquake Study by Colorado University)*

There are two uncovered fault lines passing through Muzaffarabad one of which was activated in the October 2005 earthquake. All structures that are constructed along these fault lines are considered located in unsafe or high risk areas. Furthermore, there are structures located below slopes of mountainsides where landslides have occurred. These slopes are considered unstable and the structures on the slopes as well as those below the slopes are therefore in high-risk areas. Among this is the Shuwai neighbourhood near the Chehla Bandi Bridge.

2.2.1. Buildings and Structures

The destruction caused by the earthquake in Muzaffarabad was severe with 38,562 *pakka* and 69,595 *kacha* structures completely demolished while 6,790 and 10,330 suffered damages. 1,231 education-related building collapsed, and more than a hundred other government and health structures also crashed[1]. (For detailed description of earthquake devastation, see *Annex IV: Most-Affected Areas in District Muzaffarabad, Markaz/Union Council-wise)*

Different types of buildings that collapsed during the earthquake have been observed. Three classifications of building were identified as follows:

- Unreinforced Stone Masonry buildings
- Unreinforced Solid Concrete Block Masonry Buildings
- Reinforced Concrete Framed Buildings

Among the findings that showed why these buildings collapsed during the ground shaking produced by the earthquake were:

- Poor quality of concrete used for fabrication of blocks, rendering low strength blocks
- Poor quality of mortar
- Inadequate thickness of walls (6 inch) which were the main shear resisting elements.
- No integrity of the wall in the transverse direction
- Weak connections at corners
- Most of the structures were designed with strong column-weak beam connections
- Deficient design for seismic forces, improper length and location of column splices, improper spacing and anchorage of lateral ties in columns, and poor quality of concrete

In Muzaffarabad town centre, there are more than 600 condemned buildings whose structures were damaged by the last earthquake. The PAK government has allocated funds for the demolition of these structures under the Removal of Debris initiative worth PKR 409.266 million. According to the Municipal Administrator, the demolition of the condemned buildings will soon begin.

The ERRA is responsible for ensuring that structures to be rehabilitated or reconstructed with government assistance adhering to the guidelines. An organizational structure down to the

[1]All figures from the Assistant Commissioner for Relief AJ & K

district level has been set up to implement the rehabilitation and reconstruction plan. Some of ERRA's achievements for 2005 2006 are listed under[5]:

a. *Housing Rehabilitation / Reconstruction*

- A total number of 577,062 rural houses have been assessed and 536,648 MoUs have been signed with the owners, out of a total of 630,000 houses reported to be damaged and destroyed. Funds amounting to Rs. 29.82 billion have been disbursed to 422,777 beneficiaries.
- Bank/post office accounts have been opened for over 600,000 beneficiaries for direct transfer of compensation to their accounts without the use of any intermediary.
- In order to impart training, 12 Housing Reconstruction Centres (HRCs) have been established at strategic locations. So far 9,000 Master Trainers have been trained at these centres who, in turn, have trained 75,000 artisans and house-owners in 282 affected Union Councils. An outreach programme by these HRCs has also been launched for direct training at the village level to further increase the number of skilled persons.
- So far, 65 construction material hubs for the provision of key materials have been established at controlled prices. Process for establishment of satellite hubs in remoter valleys has also started.
- Initially three standard housing designs based on stone, brick and block construction were issued. Recently two additional designs covering timber based and RCC frame construction have also been added to the menu.
- An estimated 25% of the affected households have started reconstruction and majority of them are complying with ERRA specified construction guidelines.
- Plinth level inspection for the release of 3rd tranche of PKR.25, 000 has started.
- Additional funding for housing sector is being negotiated and the potential donors include Asian Development Bank (US$ 300 million), World Bank (US$ 200 million) and Islamic Development Bank (US$ 130 million).
- Urban Housing Damage Assessment survey is complete. Final Master Plan of Muzaffarabad has been prepared and presented by Japan International Cooperation Agency (JICA) on September 2, 2006.

b. *New Standard Designs for Health & Education Facilities*

Preparation of new standard designs for health and education facilities to ensure user friendly and safe buildings for the future.

c. *Revision of Building Codes*

Revision of building codes to establish appropriate building standards during reconstruction.

[5] ERRA, *Rebuild, Revive with Dignity & Hope: Annual Review 2005- 2006*, October 2006.

Areas of Concern

The number of monitoring and inspection teams are not enough to provide appropriate cover to ensure that guidelines are followed by contractors and other partners constructing the houses and / or the buildings. Some people living in rural part of the district have voiced preference for the old design of pakka/kacha houses because these can keep cold out while the tin roofs cannot.

There are also objections already being raised regarding the Muzaffarabad Master Plan that intend to move structures farther away from the inactivated faulty line in the southern portion of the Municipality. On the one hand, concern is being brought out to the instruction of rebuilding structures in identified red zones or hazardous areas.

Finally, the aspect of political will is raised again regarding the capability of the government office/s concerned to enforce the revised building code.

2.2.2. Lifelines

Water, power and communication services were severely damaged by the earthquake. Health and education systems were seriously impaired. These added to the difficulties faced by the physically injured and the traumatized residents of district Muzaffarabad.

Most of the collapsed structures were damaged by the shaking of the ground. Only those which were located on and below the mountain slopes were destroyed by the landslides and rockslides. A few were destroyed when taller buildings collapsed on them.

The major highways linking Muzaffarabad to Pakistan and to other districts of PAK were impassable due to landslides, rockslides and cracked pavement. Other secondary roads also suffered. In the first days immediately after the earthquake, the only way was by climbing over the mountains or the use of helicopters.

In district Muzaffarabad, 70 health facilities units were destroyed or damaged including one DHQ Hospital, one THQ Hospital, five RHCs, 44 BHUs and 19 Civil Dispensaries.

Health Facilities in District Muzaffarabad: Pre and Post Earthquake Comparison

Category	Before Earthquake	Damaged during Earthquake 2005
DHQ Hospitals	02	01
THQ Hospitals	01	01
RHC	06	05
BHUs	47	44
Cds	19	19

Source: District Health Plan, Muzaffarabad 2006-07, DoH/AJ&K and ERRA/Pakistan, supported by World Health Organization.

Health Profile of Muzaffarabad: Assessment findings							
Total facilities	Facility level	Total facilities	No of facilities assessed	# supported by external agency			
	BHU	58	45	26 (48%)			
	RHC	7	7				
	Hospitals	3	2				
	Total	68	54 (79%)				
Access	Accessible by all vehicles		Accessible by 4X4 only	Accessible by foot only			
	48 (88%)		4 (7%)	2 (4%)			
Current Structure	Building	14 (26%)	Utilities available	Functional toilet	33 (61%)		
	Tent	18 (32%)		Water supply	20 (37%)		
	Prefab	9 (17%)		Electricity	37 (69%)		
	Multiple structures	13 (26%)					
Staff available (as against posts)	MO (male)	25 (46%)	Services available				
	MO (female)	8 (15%)	OPD	53 (98%)	TB management	13 (24%)	
	Dispenser/ technician	51 (95%)	IPD	17 (32%)	EPI	43 (80%)	
	LHV	42 (78%)	Pre-natal care	25 (46%)	ORS provision	46 (85%)	
	Vaccinator	38 (70%)	Delivery	18 (33%)	Laboratory	12 (22%)	
Status of Equipment	Well equipped	11 (20%)	Family planning	36 (67%)	Minor surgery	20 (40%)	
	Average	22 (41%)	Growth Monitoring	15 (28%)	Access to ambulance	13 (26%)	
	Poorly equipped	21 (39%)					

Source: District Health Plan, Muzaffarabad 2006-07, DoH/AJ7K and ERRA/Pakistan, supported by World Health Organization

2.2.3. Population

The majority of the Muzaffarabad population is classified as belonging to the middle and lower middle economic strata with their livelihood mainly in the areas of services. This shows that most do not have savings on which to fall back in case of emergencies with no access to banks and other financial credit institutions. This is most obvious in the case of owners of condemned building who continued the use of structures for both private and pubic purpose despite the danger. The inability of the government to impose safety restrictions also betrays its incapability to offer alternative to the affected families.

With regards to the earthquake, almost all the interviewed district officials have stated that none had thought of earthquake as a hazard to be considered in their areas despite the occurrence of tremors in northern areas of Pakistan and neighbouring India and Iran.

2.2.4. Environment

Forest products have been one of the major sources of revenues of Pakistan Administered Kashmir as it contributed about 60% to the coffers of the State. The October 8 earthquake has also affected forestry, aquatic and terrestrial ecosystems in the area. The post-disaster scenario presents with the following risks:

- Increased deforestation due to demand of timber for reconstruction and wood for cooking and heating
- Land slides in the wake of earthquake and historic denudation of mountain areas caused by tree cutting and agricultural activities

The illegal cutting of logs contributed to the slope degradation which aggravated the landslide effect of the earthquake. To contribute to the reversal of this situation, the PAK government has instituted a check on rampant log cutting by allowing only the logging of dead trees. The Forest Department has raised the alarm on the increasing encroachment of forest lands especially by families either displaced by the earthquake or in search for alternative livelihood to sustain a family. This situation could lead to annulment of the results intended in the government check on illegal log cutting. In lieu, the government has allowed logging of dead trees. The fragile forest environment of PAK has been studied by different UN and scientific agencies.

Forest Cover as percent of land area

S.No	District	Total Area (Ac)	Forest Area (Ac)	Forest Cover %
2	Muzaffarabad	588,142	218,168	37

Source: Raja Muhammad Rafique Kiani, Assessment of Damage in Earthquake Affected Areas of AJ&K, A PPT Presentation, Central Forest Office Muzaffarabad AJ&K.

2.3. The Flood Situation

The 1992 flood disaster in PAK and in the areas of Pakistan along the Jhelum River occurred in the summer monsoon season. This was the worst event recorded since 1959 and brought in its wake large economic losses and infrastructure damage to PAK and Pakistan. This record breaking heavy rainfall occurred during the month of September. The abnormal monsoon rainfall was related to the interaction of monsoon depression with an intense westerly passing over north of Pakistan.

The damage caused in Muzaffarabad by the September 1992 flood is shown below:

CATEGORY		Loss in Number
No. of Villages Affected		292
No. of Persons Affected		13,169
No. of Casualties (Killed)		54
Houses Damaged	Mud houses	3793
	Brick plus concrete houses	-
Houses Demolished	Mud houses	1710
	Brick plus concrete houses	42
Shops Damaged	Mud shops	55
	Brick plus concrete shops	255
Shops Demolished	Mud shops	180
	Brick plus concrete shops	161
Mosques Damaged		12
Cattle lost		3558
Hotels Damaged		3
Water Mills		356
Petrol Pumps		3
Saw Mills		5
Crush Machines		2
Total Area Affected (in Acres)		33083
Total Trees Affected		3563

Source: Falak Nawaz & Mohammad Shafique, *Data integration for flood risk analysis by using GIS/RS as tools*, 2005. http://www.gisdevelopment.net/application/natural_hazards/floods/ma03032.htm

2.3.1. Settlements and Structures

With regards the flood hazard, there are growing settlements along the river and these are in risk of being destroyed and the occupants killed in case of a recurrence of the 1992 flood disaster. Most of these flooding points have a localized impact. However, some of these flooding points have a tendency to disrupt the traffic and paralyze city life.

2.3.2. Lifelines

During the 1992 floods, all bridges, except one, the iron bridge, that linked the city centre to other parts of the district were demolished by the raging waters. This cut off the town centre for a few days, according to the Administrator of the Muzaffarabad Municipal Corporation. There were no reports regarding damages to health and education buildings or the cutting off of the water and power services in the city and the other parts of the district.

Annual flooding in some parts of the district and city occur and create traffic congestion. If not responded to, these events could contribute to the disruption of city life in the near future and to the development of a disaster situation.

2.3.3. Population and At-Risk Elements

All residents and farm animals living in the flood plain are among the threatened elements in a flood disaster of 1992 characteristics. Crops and vegetation in the floodplain are also threatened. Most of the people who are presently residing here are not knowledgeable of the flood's strength and havoc wrought. This ignorance of facts can contribute to false sense of security especially with the presence of some "flood protection" activities such as the building of weir dikes along a stretch of the river. However, the Met Bureau has modelled the flood disaster and identified the factors that combined to create the flood.

The warning system that could enable the threatened population to evacuate before the raging waters reach the area does not seem to be in place yet. The absence of this system coupled with a lack of pre-identified evacuation site may spell the difference between a disaster and an extreme event. Furthermore, the floods can cause other effects such as the formation of a dam with the debris carried by the waters and then, the break out of this temporary dam could harm downstream settlements.

2.4 Fires and Road Accidents

Fire problems and road accidents occur frequently in Muzaffarabad. These are considered as manageable emergency events and not disasters, according to police official interviewed. However, the district is not in a position to face such hazard and disaster as it has no equipment or manpower trained for such events.

There is a need to come up with a study to ascertain the status of these man-made events in terms of deaths and destruction to properties. The study will assist in determining whether the fire and road accidents warrant more attention than is presently being given.

The cumulative impact of accidents is not considered because natural disasters are a sudden

occurrence and attract people by the force of their immediate consequences. Accidents taking toll of human lives and economy are often underreported and go unnoticed and the victims of these incidences are also ill compensated. It is therefore necessary to pay adequate attention to accidents and formulate appropriate policies for giving equal treatment to the victims of these events and also to make efforts for mitigating these.

SECTION 3:

Disaster Risk Reduction Strategy

The Hazard and Vulnerability Analysis shows that the rural areas and town centre of district Muzaffarabad are vulnerable to landslides, earthquake and riverine flood disasters in different degrees. In view of this, the plans for mitigation and preparedness will have to be evolved while the implementation is to be monitored locally at the union council level to reduce the impact of the disasters. A community based monitoring scheme will be more effective but this has to be established in relation to the development of capacities of the union and wards.

Furthermore, experience has shown that mitigation and preparedness plan should be area specific. This considers the nature and type of vulnerabilities which will determine, to a great extent, the risk reduction strategies. Given the principles of disaster management, the strategies are oriented primarily to the social and impoverished communities and families as against the vulnerability of the overall system.

In view of the risks and the vulnerabilities identified in the earlier sections, the disaster risk reduction measures proposed are presented using the hazards as the point of reference. These are landslide, earthquake and flood. The events of traffic accidents, domestic fires and annual health epidemics are not tackled as the views of the concerned officials show that these are localized and controllable emergencies and not disasters. Prevention measures to ensure that these do not develop into disasters will be the responsibility of the District Disaster Management Authority Muzaffarabad.

Based on these, the requirements for the line departments will have to be identified keeping in view their future growth requirements as well as specific demands put on them as a result of disaster management plan exercise. It is expected that special procurements and inputs will enhance the capabilities and the quality of service and rationalize efficient contributions of the limited manpower resources available with these agencies. The risk reduction strategy also envisages the possibilities of upgrading the quality of human resources, through training, in the long run.

3.1. Institutional Mechanism for District Disaster Management Authority (DDMA) Muzaffarabad

Muzaffarabad is a special area in that it is the capital of PAK, the business center, the most advanced district in the state, and also has a city/town center. As such administration of the State and district are both in Muzaffarabad. The establishment of the District Disaster Management Authority (DDMA) Muzaffarabad is the keystone of the proposed disaster risk reduction

strategy. All activities aimed at hazard impact reduction and decreasing the vulnerability of at-risk population, private and public assets and the environment, require the presence and participation of the DDMA.

The coordination of efforts of all district departments, the non-governmental organizations and civil society is a major concern of the DDMA Muzaffarabad. The present sectoral coordination arrangements will be strengthened by the multi-sectoral coordination that will be handled by the DDMA. These meetings will afford all the stakeholders the opportunity to have a bird's eye view of all the efforts being undertaken to make Muzaffarabad a safer place.

The systems to be set-up by the DDMA Muzaffarabad will be backed up by appropriate equipments and trained staff. The existence of a Municipal Corporation also has to be considered in the development of the different activities of the DDMA.

The DDMA is a coordinating mechanism for all government agencies and non-governmental organizations operating in a district and have functions which are important for disaster risk reduction as well as disaster response.

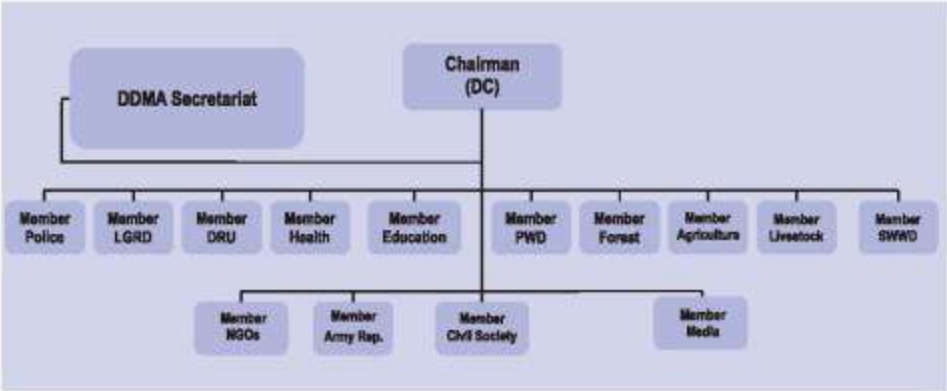
The DDMA is composed of the following:

Deputy Commissioner	District Disaster Management Authority Head
Office of the Deputy Commissioner	Member, DDMA Secretariat
Agriculture	Member
Civil Defence	Member
Civil Society Representatives in the District	Member/s
Designated Local Representative of the Pakistan Army	Member/s
Education	Member
Fire Service	Member
Forestry	Member
Health	Member
Livestock	Member
Local Government	Member
Muzaffarabad Municipal Corporation, Administrator	Member
NGO Representatives in the District	Member/s
Pakistan Red Crescent	Member/s
Police	Member
PWD	Member
Others	Member

3.1.1. The Office of District Disaster Management Authority Muzaffarabad

The Deputy Commissioner (DC) is the head of District Disaster Management Authority. In running the day-to-day operations of DDMA, a Secretariat would assist the DC. The make-up of the office of the DDMA will depend on the set-up of the State Disaster Management Authority because of the integrated and interdependent nature of these organizational units and also in consideration of economies of scale.

DDMA members will include designated representatives of all line departments in the district.



3.1.2. Functions of the DDMA

Based on the Ordinance No. XI of 2006, titled National Disaster Management Ordinance, 2006, the District Disaster Management Authority has the following functions to perform:

- Formulate district disaster risk management plan, based upon a hazard and vulnerability analysis of the district
- Coordinate and monitor the implementation of district plan in accordance with the State Disaster Risk Management plan
- Continuously monitor the hazards, risks, and disaster threats and the conditions of vulnerable population within the district
- Prepare guidelines for mitigation, preparedness, and response as well as for vulnerability reduction
- Identify training needs and conduct education, training and public awareness programs

- Conduct training in disaster risk reduction and relief administration for local government officials, public and civil society representatives and at-risk communities
- Set up, maintain, review and upgrade district level early warning and communication systems for effective dissemination of warning messages
- Coordinate with local authorities to ensure that post disaster activities are carried out promptly and effectively
- Mobilize and coordinate all interventions from other agencies at the time of emergencies
- Mobilize needed financial and material resources for disaster risk management
- Implement disaster risk reduction and response activities as decided in the district disaster risk management plans
- Review development plans of government departments at the district/municipal level and provide guidance on mainstreaming disaster risk reduction measures in these plans
- Identify buildings and places in the district/municipality that could be used as evacuation sites or relief centres in case of a disaster and make arrangements for water supply and sanitation in such buildings or places
- Establish stockpiles of relief and rescue materials or ensure preparedness to make such materials available at a short notice
- Encourage the involvement of non-government and community groups in disaster risk reduction and preparedness
- Identify alternative means for emergency communications should the regular channels be disrupted
- In the event of a disaster, the DDMA will take operational control, by activating the Emergency Operation Centre, of the situation to ensure that support is delivered promptly to the affected communities
- Keep linkages with the State Disaster Management Authority and the Relief Department
- Perform such other functions as the State government of the PAK may assign to it or as it seems necessary for disaster risk management in the district

3.1.3. The Secretariat of the DDMA

In running the day-to-day operations of the DDMA, a Secretariat would assist the Deputy Commissioner. It should be led by a District Disaster Officer, who should be responsible, committed and experienced in disaster risk management. During the consultative workshop on draft DDRMP by the UNDP consultants, the stakeholders approved the idea of the Civil Defence Official to be the District Disaster Officer. He/she should have a dedicated team of technical, liaison and support staff so that the DDMA works efficiently through out the year.

It is suggested that the minimum staff of the DDMA will be one Head, with district level personality and authority, one office secretary (ex. officio) and two technical staff assistants, one liaison officer and one driver within the secretariat.

3.2 Implementation Activities of DDMA in District Muzaffarabad

3.2.1. Pre-Disaster Activities

The DDMA is the focal organization and authority in conducting and implementing activities and actions on disaster management in district Muzaffarabad. In the event of a disaster the DDMA will be complemented by the union council and community based disaster management groups in carrying out emergency response and relief activities in the affected areas.

During the pre-disaster stage, the DDMA is expected to undertake selected mitigation activities to make it ready for the onset of any disaster. In this instance, activities are suggested to be accomplished with in six months and one year time frame.

a. Suggested Mitigation Activities

- Develop warning system for communities in identified landslide prone areas and the transport system passing through landslide prone highways and roads
- Organize communities and train them in emergency response for landslide hazard
- Come up with a district map identifying actual and potential landslide prone areas in coordination with the AJ&K University, appropriate line departments, UN organizations, and NGOs
- Design Action Plan for Landslide Risk Response that will include among others population details of threatened areas, evacuation routes, camp sites for temporary use, and selected areas for permanent shifting of families, livelihood assistance, and the like
- Establish institutional linkages with national and international agencies undertaking studies on topics such as warning systems, emergency response activities, and mitigation interventions for earthquake hazard. The organizations may include Pakistan Metrological Department, Federal Flood Commission, Geological Survey of Pakistan (GSP), National Engineering Services Pakistan (NESPAK) and Pakistan Space and upper Atmosphere Research Commission (SUPARCO) etc.
- Document and monitor transport situation with the police and transport offices, to include vehicular accidents, number of dead and injured, location of accident, cause of accident, etc. and develop a trend analysis for use in development of a transport hazard reduction plan
- Implement safer construction techniques in rural areas

b. Preparedness Activities to be Accomplished within Six Months

The officers and members of the DDMA shall without delay:

- Set up the office, secure equipment and design and install office systems (e.g. Disaster Management Information System)
- Conduct the fist inter-agency coordination meeting for familiarization with the DDMA set up and its operating system. Agenda may include organization of an adhoc team for Damage and Needs Assessment (until such time that the more permanent inter-agency arrangement is formed), the build-up of District Emergency Response team, stockpiling of essential commodities, and the like
- Undertake an executive level disaster management training seminar for officials of district departments, selected as focal persons on disaster management to provide comprehensive

understanding of the policy requirements and operational aspects of the Disaster Risk Management from the state, district, tehsil, union council and village levels

- Secure from JICA the statement on the safety of the relocation areas in town centre and certification on the statement that 85% of the town centre area is "fit for living"
- Initiate the training and formation of a skeletal emergency operations group for the district in Collapsed Structures Search and Rescue and Medical First Responders Skills. Ensure that this group is also equipped after the training *(refer to No.3.2.4. b, Equipment for Immediate Procurement)*

  Note: The training for Muzaffarabad Rescue Team should involve selected personnel from Neelum, Rawalakot and Bagh districts from the Police, Fire Brigade and the Civil Defence Departments. Selected NGOs and voluntary agencies may be included in these training.
- Call the first Multi-Sectoral Meeting with NGOs and voluntary agencies, introduce the DDMA and discuss coordination points and SOPs
- Conduct Training Needs Assessment and organize training in disaster risk management for selected tehsil and union level officials and NGOs operating in the areas
- Conduct Community Based Disaster Management Training Seminars for selected persons in the most hazard-prone villages
- Assist in completion of the Muzaffarabad Municipal Master Plan
- Test run communications system with State DMA, municipal committee, tehsils and NGOs and CBOs in the district
- Arrange initial training of two K-9 units

c. *Preparedness Activities to be Accomplished within the First Year*

The DDMA is to undertake the following activities within the First Year of this Draft Plan:

- Finalize Standard Operating Procedures for the district level coordination and action covering all aspects and phases of disaster risk management based on State DMA policies and procedures. Among the concerns here will be an inventory of department assets (manpower, skill, equipment, etc) and assessment of these resources for disaster risk management purposes
- Assist in setting up a Municipal Committee plan for Control Room during emergencies
- Finalize communications system with State DMA, Tehsils, Union Councils and Village Disaster Management organizations
- Finalize coordination mechanisms and SOPs with NGOs at the multi-sectoral level and

establish coordination in rescue, relief and rehabilitation activities as well as information sharing

- In coordination with the appropriate departments, conduct union council level meetings to increase awareness of target population regarding the major hazards in the district
- Undertake at least one training on Mass Casualty Management for personnel of selected hospitals and health organizations
- In coordination with ERRA and DRU, conduct evaluation of randomly selected residential structures, educational buildings and related structures to determine adherence to earthquake safety measures
- Identify evacuation areas and develop evacuation plans with and for residents of threatened areas
- Assist line departments to conduct disaster management capacity assessments and formulate capacity development plan for each department considering the approved PC-1s
- Establish stockpile warehouse in the district and maintain the quality level of the supplies
- Discuss with Public Works Department (PWD) the provision of safer alternative routes linking the district to the outside world
- Ensure budgetary and financial support for district level activities

3.2.2. Activities During Disaster Events

a. Establishment of the District Emergency Operations Centre (DEOC)

In the event a disaster emergency occurs, the District Disaster Management Authority shall activate the District Emergency Operations Centre (DEOC) and take the operational lead for all district administration departments. The DDMA Head will manage the EOC and is responsible for ensuring that following activities are always undertaken:

- Set up the EOC
- Advise State DMA on the disaster situation
- Send out Damage and Needs Assessment teams
- Set up Relief Centres (following the SOPs for relief by Revenue Department) for residents residing outside the municipal or town centre
- Supervision and monitoring of disaster management and relief activities
- Coordinate the activities of
  - Police
  - Municipal Committee Control Room
  - Fire Brigade
  - Civil Defence
  - PWD

  - Health Department
  - Army District Command
  - Other members of the DDMA with emergency response functions
- Enlist services of laboratories and expert institutions for specialised services through the Health Department as and when required
- Issue advisories on the disaster situation immediately and in appropriate time phases thereafter to the State DMA and the general public
- Operate a public information display area for immediate access to information by the public and media regarding the disaster and the current situation
- Arrange requisition of accommodation, structure, vehicles and equipments for relief
- Set up transit camps and arrange food distribution
- Arrange dry rations and family kits for cooking
- Provide gratuitous relief
- Organise and coordinate clearance of debris
- Carry out temporary repairs to damaged infrastructure
  - water
  - telecommunication
  - public buildings
- Set-up an information centre to organize sharing of information with the media and the public
- Generate and provide all information contained in the Risk and Vulnerability Assessment document to other control rooms and in special circumstance communicate about the disaster prone sites to all control rooms
- Manage international relief coming into the district
- Monitor disaster warning or disaster occurrence and communicate the same to tehsils, union councils , and wards/ villages for better preparedness and effective response in coordination with and on the advise of the following agencies :
  - State DMA
  - Meteorological Department (Heavy Rains, Cyclones)
  - SUPARCO (Earthquakes)
  - Fire Brigade, Police (Road Accidents, Riots, Bomb threats/blast, Fires, House Crashes)
  - PWD and LG&RD (Landslides)
  - Health Department (Epidemics and Food Poisoning)

b. *Emergency Response Equipment*

Materials/equipments needed for emergencies for immediate procurement (within 6 months)

Cutters	Hammers and Chisels
Helmets with Lights	Stretchers
Shovels and Picks	Megaphones
Ropes	Ladders

Materials/equipment to equip a fully capable District Emergency Operations Centre (DEOC)

· Ambulances	· Mobile X-Ray units
· Boats/rescue boats	· Public address systems
· Buses	· Pumps diesel and electric
· Cranes	· Self breathing apparatus
· Demolition equipments	· Sniffer dogs
· Drilling rigs	· Tankers/ dozers
· Earth moving equipments	· Tents
· Foam tenders	· Toxic gas masks
· Generators	· Tractor
· Ham sets	· Trucks
· Helicopter service	· VHF sets with batteries
· Mobile trauma care vans	· Wireless sets

c. *Activities of Line Departments Before and During Disasters*

The various line departments will be responsible for coordinating and facilitating the performance of certain emergency services and functions within their departments. These activities would ensure availability and movement of staff and resources of their respective departments for response to the emergency at hand. Additional assistance of the District Emergency Operations Centre (DEOC) may be sought in emergency situations.

Army

- Maintain liaison with the DEOC for vital inputs during warning period
- Collate information and warn appropriate army units
- Coordinate movement of human resource and material as required
- Establish communication system reaching till the sites of disaster and supplement the civil communication set up if required
- Coordinate all military activity required by the civil administration

The armed forces can be requested to also perform the following activities in the event of a disaster:

- Command centre for relief. This would include provision of communications (radio, telephone) and specialized manpower
- Provide medical aid
- Provide medical care with the help of medical teams, including treatment at the nearest armed forces hospital
- Organize transportation of relief material
- Provide logistic back-up (aircrafts, helicopters, boats, etc) and vehicles for transportation of relief material to the affected areas
- Establish relief camps
- Set up relief camps and oversee their running, if needed
- Construct and repair roads and bridges to enable relief teams/material to reach affected areas. This will include provision of technical and plant equipment such as cranes, bulldozers and boats etc
- Organize maintenance of essential services
- Repair, maintenance and running of essential services in the initial stages of relief
- Evacuate people to safer areas
- Assist in evacuation of people to safe places before and after the disaster
- Local management of international relief can be undertaken by the defence services

Civil Defence

- Rescue and evacuation
- Communicate to DEOC details of all the above activities
- Communicate to DEOC any additional resources required for performing the above tasks

Fire Brigade

- Rescue and evacuation
- Salvage Operations
- Communicate to DEOC details of all the above activities
- Communicate to DEOC any additional resources required for performing the above tasks

Health

- Provide emergency treatment for the seriously injured
- Ensure emergency supplies of medicines and first-aid
- Corpse disposal
- Preventive medicine and anti-epidemic actions
- Supervise food, water supplies, sanitation and disposal of waste
- Assess and co-ordinate provision of ambulances and hospitals where they could be sent (public and private);
- Provide special information required regarding precautions for epidemics
- Set-up an information centre to organise sharing of information with public
- Communicate to DEOC details of all the above activities
- Communicate to DEOC any additional resources required for performing the above tasks

Local Government & Rural Development

- Provide information on the situation of rural areas and submit the same to the DEOC
- Monitor progress of relief operations in the rural areas
- Send advisories to the DEOC on the progress of disaster situation
- Assist and facilitate Damage and Needs Assessment teams from NGOs

Municipal Committee Control Room

During disaster emergencies, the Municipal Committee will be involved in the delivery of following activities within its area of jurisdiction:

- Send Initial Damage and Need Assessment Report of the Town to District EOC
- Salvage Operations for areas within the town centre

- Corpse disposal
- Assist other agencies for movement/transport of staff including rescue parties, relief personnel and relief materials
- Communicate to the DEOC additional resources required by various control rooms
- Establish communication links with DEOC, Union Council Disaster Management Committees (DMCs), NGO coordinating committee and private donors
- Course all information and any other as instructed by the DEOC
- Provide official identification bands to all ward officers and other Municipal officers on disaster duty for easy identification
- Issue passes and identity cards to relief personnel including the persons from NGOs operating in the Town Centre
- Coordinate NGO activities through necessary support to ensure community participation by establishing coordination mechanisms among NGOs
- Identify NGOs to serve on committees task force
- Assign well-defined area of operations and assign specific response functions to specialized NGOs and report to DEOC
- Coordinate supplies distributed directly by NGOs and other organizations including private donors

Police

- Co-ordinate with District EOC
- Cordon the area to restrict movement of vehicular and pedestrian traffic
- Shift the rescued/affected people to hospitals
- Provide easy access to rescue and relief personnel/vehicles
- Corpse disposal
- Law and order
- Divert traffic on alternate routes as and when necessary in co-ordination with PWD
- Request PWD for providing access through roads during emergencies for specific time duration and monitor the requirement of such an access

Public Works Departments

- Send advisories to the DEOC on road conditions especially regarding blocked or impassable roads
- Organize draining of flood waters from roads
- Set-up an information centre to organise information for public

- Communicate to DEOC details of all the above activities
- Communicate to DEOC any additional resources required for performing the above tasks
- Rescue and Salvage Operations for road accidents
- Monitor flood situations and landslides on roads and co-ordinate with DEOC for mass transport requirements and advisory on rerouting of traffic, as needed

Revenue Department

- Establish relief distribution centres
- Accept relief donations and relief support
- Put up camps, if warranted by the situation, and manage the same
- Request assistance from the DEOC, as needed
- Submit reports to the DEOC of operations and expenses

Women and Social Welfare

- Provide the DEOC with reports on the impact of disaster on women, children and poor in affected areas
- Extend advisories to the DEOC regarding observance or violation of gender principles
- Send report to the DEOC regarding needs assessment of vulnerable segments of the population

3.2.3. Post-Disaster Activities

The DDMA is also responsible for pursuing the efforts of recovery of communities affected by the disaster.

a. Recovery and Rehabilitation Activities

- Post disaster Damage and Need Assessment: Inter-disciplinary team with community involvement
- Recovery planning based on need assessment: Multi-disciplinary team with community involvement
- Linking with State development plan
- Implementation of recovery and rehabilitation plan with community participation
- Coordination integrated with monitoring and evaluation participated in by the affected communities

b. Minimum Intervention

The recovery management approach should be one of minimum intervention. However, recovery services and information should always be readily available within disaster affected communities and be responsive to the range of needs.

External recovery services and resources are provided as a support to an affected community, to be used if the needs following the event are beyond the capacity of existing services and resources. Wherever possible additional resources should be under local management through the network of existing service providers.

3.3. Community Based Activities

In partnership with NGOs already involved in risk reduction activities at the community level, the union councils and ward/village leaders should develop the Union and Ward/Village Disaster Management Plans based on the DEOC's Plans regarding actions during emergencies and disasters. It must be kept in mind that disaster, such as the 2005 Earthquake, resulted in cutting off essential services. Furthermore, experiences in other countries have also shown that despite administrative preparedness, the government may not be able to bring relief to particular communities immediately. In district Muzaffarabad there are villages that are located in the mountains and are not immediately accessible even by four-wheeled vehicles, in such a case, community based disaster management activities will be really effective.

3.3.1. Community Preparedness

Mitigation efforts and preparation of the disaster risk management plan for local areas are essential elements and pre-requisites. Preparedness to a large extent would reduce the impact and damage. Training and simulation exercises for enhancing the community's preparedness and response capability to identify risks will simultaneously strengthen and enhance capacity of the administration to undertake necessary preparedness or evacuation.

As a part of general preparedness at community level, the NGOs will make the communities conscious about the type of hazard that the community faces. Thus local disaster risk management plans for hot-spot areas in the context of specific vulnerability would be developed.

a. During Emergency Situations

For appropriate security and to maintain law and order, precautionary evacuation would be undertaken with assistance from community leaders and community based organisations (CBOs). The entire family would evacuate together as a unit. However, to avoid stampede and confusion and in cases of inadequate transport or limited time, emergency evacuation would be

undertaken in an orderly manner.

The community evacuation plan should train the community residents how to leave the area in an organized manner and move to the safe place or evacuation site without losing any family member. The proper steps to orderly evacuation must be learned by the community members.

Also, there should be training in the management of evacuation centres so that the developmental nature of this activity can be safeguarded through the participatory arrangements involving the affectees. This will include participatory method in distribution of relief assistance and running of the evacuation camp affairs.

b. During Relief and Rehabilitation

After the impact of a hazard in a disastrous situation, members of the community may be depressed or still panicky. The learning from the 2005 Earthquake showed that many families sold their animals at very low prices for fear of being unable to tend these because of helplessness. The community could have come together to extend help for the more injured members and give succour regarding care of the animals. An organized community will be able to promote help for each other. This will also assist in the early recovery and promote confidence in the rebuilding stage after the disaster.

Organizing a community managed and owned disaster management organization is going to ensure the achievement of the goal of resilient community.

c. Areas of Community Participation

The DEOC Muzaffarabad and NGOs at the disaster site should ensure maximum community participation in all stages of operation in order to maintain community morale and confidence; maximize the use of local resources and promote a faster recovery. Disaster management situations offer a wide range of choices and demands that require immediate decision making. Participation of communities and their representatives would duly inform the field agencies about communities' perceptions and would thus create public ownership of the official decisions.

Based on local dynamics, ethos and the experience of other countries, an appropriate strategy to ensure community support needs to be evolved. Such efforts to enlist community support and participation have gone a long way in reassuring the community about administration's intent and seriousness about managing the disaster.

3.4. Directions for Community Based Response Plan

The involvement of communities in the District Disaster Risk Management Plan necessitates action at the micro-level and at the ward level. The Plan will have to be evolved with the

participation of village residents, their leaders and the officials of the union councils. When disaster is localised at union council level and can be managed locally, community based disaster management plan will come into operation.

However, a disaster situation may cover a major part of the city which would call for co-ordination of activities at the city level. Under such conditions, the community based plan in the affected wards would be in operation along with the DDRMP.

The response structure given in the ward plan essentially limits itself to micro-level intervention. When more than one ward are affected, DEOC which is the co-ordinating authority, would expect the ward officers to co-ordinate the activities at ward level with the line agencies such as Fire Brigade, Police etc., while the inter-ward co-ordination will be the responsibility of DEOC.

The Community Based Disaster Management Plan will include the following:

- Responsibilities of CBOs on receipt of warning or occurrence of disaster
- Responsibilities of ward officer on receipt of warning or occurrence of disaster
- Responsibilities of the tehsils and union councils on receipt of warning or occurrence of disaster

3.5. Non-Governmental Organisations (NGOs) and Voluntary Agencies

The non-governmental organisations and voluntary agencies play an important role in disaster management and provide a strong band of committed volunteers with experience in managing the disasters. Their strength lies in the choice of their manpower, the informality in operations and flexibility in procedures. These organisations enjoy a fair degree of autonomy and hence can respond to changing needs immediately.

However, in order to maintain uniformity in operations and effective co-ordination, it is desirable that they follow the standards of services (as given in the Guidelines), information exchange and reporting so as to enable the DEOC to have a total picture of resource availability, disbursements and requirements. NGOs therefore have been assigned specific tasks by the Municipal Commissioner to undertake relief work within the overall institutional framework. As and where possible, NGOs may also be able to improve the quality of delivery of services. In addition, CBO Committees have been operating at the community level, especially in times of emergencies like house collapses, fires, and floods. Such committees have been identified at the ward level.

Specific activities in which NGOs/private sector can be involved during disaster management operations are:

- Search and rescue operations
- Information dissemination
- First aid
- Burial of dead
- Damage and Need Assessment
- Management of information centres at temporary shelters
- Mobilisation and distribution of relief supplies including finances
- Community mobilisation, crowd control, rumour control, traffic management
- Specialised services (psychiatric and mental health assistance)
- Management of transit camps
- Rehabilitation activities

The following agencies will be associated with relief and rehabilitation activities. Most of these agencies have capacity to mobilise required resources and have assisted the administration in the past in managing relief and rehabilitation activities. These agencies include:

- CARE
- CARITAS
- Islamic Relief
- Helping Hand
- Hilal-e-Ahmar
- MERLIN
- NRSP
- Oxfam
- Salvation Army
- Save the Children
- Service Clubs of Rotary, Lions and Giants
- UN Agencies
- Others

3.6. Reporting Formats

The need for common reporting formats to be used by both government and non-government agencies during disasters will facilitate understanding of messages, data and information. This will avoid both embarrassments and mistakes in the emergency work to save lives and properties. Examples of reporting formats are in *Annex X*.

The DEOC will send the Status and Action taken Report on a continuous basis to the State DMA. The DEOC will provide updates of the situation and include advisories for the State DMA to guide it in its decision-making responsibilities.

3.7. Plan Dissemination through Community Education

The DDMA will disseminate the DDRMP at four levels;

- District administration departments, and to the state level officials
- To the tehsil, union council and ward/village leadership
- Through mass media to the general public in the district
- Through existing CBOs and collaborating NGOs

In addition to dissemination of literature related to the DDRMP, the DDMA will ensure that disaster response drills are conducted by the ward officers and other agencies on a regular basis, especially in the disaster prone areas to maintain the readiness of communities and departments, with attention to operational procedures, personnel, equipment and orderly response.

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