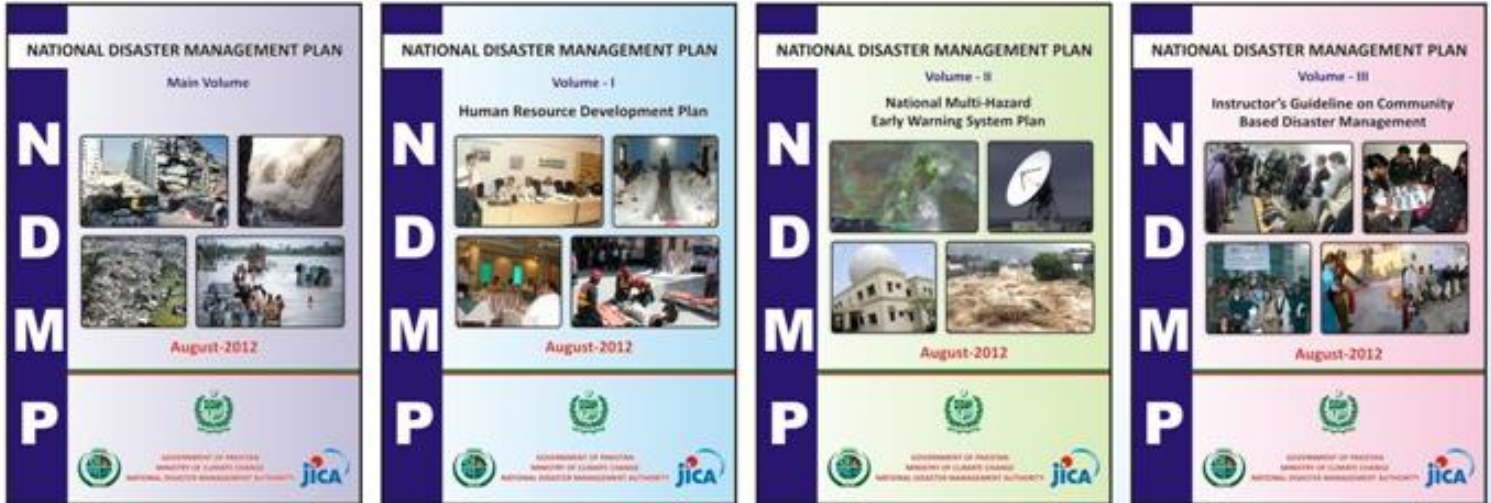


# NATIONAL DISASTER MANAGEMENT PLAN

## EXECUTIVE SUMMARY



August-2012



GOVERNMENT OF PAKISTAN  
MINISTRY OF CLIMATE CHANGE  
NATIONAL DISASTER MANAGEMENT AUTHORITY



# NDMP

The following foreign exchange rate is applied in the study:

US\$ 1.00 = PKR 88.4

## **PREFACE**

The National Disaster Management Plan (NDMP) is a milestone in the history of the Disaster Management System (DRM) in Pakistan. The rapid change in global climate has given rise to many disasters that pose a severe threat to human life, property and infrastructure. Disasters like floods, earthquakes, tsunamis, droughts, sediment disasters, avalanches, GLOFs, and cyclones with storm surges are some prominent manifestations of climate change phenomenon. Pakistan, which is ranked in the top ten countries that are the most vulnerable to climate change effects, started planning to safeguard and secure the life, land and property of its people in particular the poor, the vulnerable and the marginalized. However, recurring disasters since 2005 have provided the required stimuli for accelerating the efforts towards capacity building of the responsible agencies, which include federal, provincial, district governments, community organizations, NGOs and individuals.

Prior to 2005, the West Pakistan National Calamities Act of 1958 was the available legal remedy that regulated the maintenance and restoration of order in areas affected by calamities and relief against such calamities. An Emergency Relief Cell within the Cabinet Division has been serving since 1971 as an institutional disaster relief support at the national level. Similar institutional arrangements existed at the provincial level in the form of relief commissioners. However, that regime provided a reactive approach towards emergency response only.

The United Nations International Strategy for Disaster Reduction (UNISDR) introduced the paradigm shift from a reactive to a proactive approach in the form of the Hyogo Framework of Action (2005-2015) signed by 168 countries including Pakistan. To fulfill the global obligations as well as cope with the challenges emerged in the aftermath of the October 2005 earthquake, the Government of Pakistan promulgated the National Disaster Management Ordinance in 2007 to introduce a comprehensive National Disaster Management System in the country. The Ordinance became the Act called the National Disaster Management Act in December 2010. The Act establishes three tiers for the disaster management system: i.e., national, provincial and district levels.

Under the Act, the National Disaster Management Commission (NDMC) was established at the national level, and has the responsibility for laying down policies and guidelines for disaster risk management and approval of the National Plan. The National Disaster Management Authority (NDMA) was subsequently established in 2007 in line with the Act, and serves as the implementing, coordinating and monitoring body for disaster risk management at the national level. Along with the Ordinance (now Act), the National Disaster Risk Management Framework (NDRMF) was prepared by the NDMA in March 2007. The NDRMF served as an overall guideline for disaster risk management at national, provincial and district levels. In March 2010, the NDMA formulated the National Disaster Response Plan (NDRP) identifying specific roles and responsibilities of the relevant stakeholders in emergency response including Standard Operation Procedures (SOPs).

Concurrently, NDMA, in collaboration with national and international partners, had been in the process of strengthening the DRM system in the country. In order to support this new approach in Pakistan, the Japan International Cooperation Agency (JICA) dispatched a series of missions from the year 2008 to 2009 based on the request from the Government of Pakistan. It studied the whole legal and administrative system of DRM in Pakistan and held meetings with all stakeholders to identify the needs and requirements to enhance the capacity of the national DRM system. Based on thorough bilateral consultations, a project document on formulation of a National Disaster Management Plan (NDMP) for Pakistan was conceived for implementation through Japanese Grant-in-Aid. A PC-II was prepared accordingly and was approved by the Planning Commission in the meeting of Central Development Working Party held on 19-11-2009. For implementation through Grant-in-Aid, the scope of work for the project was discussed, agreed and signed between the Government of Pakistan and JICA on 11-12-2009 and the project Inception Report was prepared in April 2010. The Plan, aimed at enhancing the capacity of the country to prepare for and respond to disasters by defining the measures to be considered necessary for disaster management and risk reduction in line with the provision of the National Disaster Management Act (Chapter II, Section 10), was finalized in June 2012.

The overall NDMP is a comprehensive plan, having a total investment cost of USD 1040.9 million (PKR 92.02 Bn with 1 USD = PKR 88.4), consisting of the “Main Plan” document along with three supporting volumes besides the Executive Summary, which identifies macro level hazards and risk assessment, development of the multi hazard early warning system to reduce the vulnerability to disasters by enhancing and strengthening the early warning capacity, identification of the roles and responsibilities of the stakeholders, including federal, provincial and district governments, community organizations, NGOs, businesses, and individuals who are involved in the disaster management. The Community Based Disaster Risk Management (CBDRM) approach, in view of its universal reorganization and importance in DRM planning, has been given due place in the Plan. Based on pilot activities tested in different hazard contexts and social settings, best practices and guidelines have been documented in the Plan to serve as models for future CBDRM activities in Pakistan. The Plan also provides strategic direction for systematic human resource development in the field of disaster management and the operational plan for the National Institute of Disaster Management (NIDM).

The components of NDMP published in one main document with three supporting volumes, besides the Executive Summary, are entitled:

National Disaster Management Plan	Main Plan
Human Resource Development Plan on Disaster Management	Vol. I
Multi-Hazard Early Warning System Plan	Vol. II
Instructors’ Guidelines on Community Based Disaster Risk Management	Vol. III

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AD	Assistant Director	D.I. Khan	Dera Ismail Khan
ADB	Asian Development Bank	DM	Disaster Management
ADPC	Asian Disaster Preparedness Center	DMA	Disaster Management Authority
AFD	France's Development Assistance (Agence Française de Développement)	DNA	Damage and Needs Assessment
AJK	Azad Jammu and Kashmir	DRAC	District Reconstruction Advisory Committee
A/P	Administration and Procurement	DRM	Disaster Risk Management
APEC	Asia Pacific Economic Cooperation	DRMP	Disaster Risk Management Program
APT	Automatic Picture Transmission	DRR	Disaster Risk Reduction
ATO	Assistant Town Officer	DRUs	District Reconstruction Units
AWS	Automatic Weather Stations	D&SCC	Donors and Sponsors Coordination Cell
AZRI	Arid Zone Research Institute	DTC	Diarrhea Treatment Center
BoG	Board of Government	EAD	Economic Affairs Division
C&IM	Coordination and Information Management	ECNEC	Executive Committee on National Economic Council
C&W	Communication and Works	ECSRC	Executive Committee of the Space Research Council
CAA	Civil Aviation Authority	EDO	Executive District Officer
CBDRM	Community Based Disaster Risk Management	EEZ	Exclusive Economic Zone
CBDRR	Community Based Disaster Risk Reduction	EM-DAT	Electron Microscopy Data
CBOs	Community Based Organizations	ENERCON	National Energy Conservation Centre
CD	Capacity Development	EO	Evacuation order
CDG	City District Government	EOC	Emergency Operations Centre
CDGR	City District Government Rawalpindi	EQ	Earthquake
CDH	Climate Discussion Hour	ERC	Emergency Relief Cell
CDMC	Community Disaster Management Committee	ERRA	Earthquake Reconstruction and Rehabilitation Authority
CEA	Chief Engineering Adviser	ETo	Reference Crop Evapotranspiration
CFFC	Chairman, Federal Flood Commission	EWS	Early Warning System
CIDA	Canadian International Development Agency	FAO	Food and Agriculture Organization
CM	Centimeter	FANA	Federally Administrated Northern Areas
COS	Chief of Staff	FATA	Federally Administrated Tribal Areas
COSPAS	Cosmicheskaya Sistema Poiska Avariynyh Sudov in Russian (Space System for the Search of Vessels in Distress): Name of Satellite	FAX	Facsimile
C/P	Counter part	FDMA	FATA Disaster Management Authority
CPI	Cumulative Precipitation Index	FEWS	Flood Early Warning System
CPO	City Police Officer	FFC	Federal Flood Commission
CSO	Civil Society Organization	FFD	Flood Forecasting Division
CTII	CTI engineering International	FFWMCC	Flood Forecasting and Warning Master Control Centre
DC	Deputy Commissioner	FFWS	Flood Forecasting and Warning System
DCO	District Coordination Officer	FGD	Focus Group Discussion
DD	Deputy Director	F/G/S/P	FATA/GB/State/Provincial
DDMA	District Disaster Management Authority	FHA	Focus Humanitarian Assistance
DDMP	District Disaster Management Plan	FIDC	Federal Irrigation and Drainage Cell
DDRMPs	District Disaster Risk Management Plans	FM	Financial Management
DDO	Deputy District Officer	FMIS	Financial Management Information System
DDO	Drawing and Disbursing Office (in Figure 7.3.2 in Chapter 7)	FOCUS	FOCUS Humanitarian Assistance
DDRC	District Disaster Resource Centers	FPSP	Flood Protection Sector Projects
DERA	Drought Emergency Relief Assistance	F/S	Feasibility Study
DEWS	Disease Early Warning System	FY	Fiscal Year
DEO	District Emergency Officer	GB	Gilgit Baltistan
DFCC	District Flood Control Centre	GBDMA	Gilgit Baltistan Disaster Management Authority
DF/R	Draft Final Report	GDP	Gross Domestic Product
DG	Director General	GFAS	Global Flood Alert System
D.G Khan	Dera Ghazi Khan	GIS	Geographic Information System
DHQ	District Head Quarter	GLOF	Glacial Lake Outburst Flood
DIG	Disaster Imagination Game	GM	General Manager



GMDSS	Global Maritime Distress Safety System	M&E	Monitoring and Evaluation
GOP	Government of Pakistan	M&P	mitigation and preparedness
GPS	Global Positioning System	MBC	Mid East Broadcasting Center
GPRS	General Packet Radio Service	MDMA	Municipal Disaster Management Authority
GSHAP	Global Seismic Hazard Assessment Program	METI	Japan's Ministry of Economy, Trade, and Industry
GSM	Global System for Mobile Communications	MHEWP	Multi-Hazard Early Warning Plan
GSP	Geological Survey of Pakistan	MIS	Management Information System
GTS	Global Telecommunication System	M/M	Man and Month
GTZ	German Society for Technical Cooperation (Deutsche Gesellschaft für Technische Zusammenarbeit)	MMI	Modified Mercalli Intensity
HA	Hazard Assessment	MOA	Memorandum of Agreement
HEPR	Health Emergency Preparedness and Response	MOD	Ministry of Defence
H. F.	High Frequency	MOHW	Ministry of Housing and Works
HFA	Hyogo Framework for Action 2005-2015	MOST	Ministry of Science and Technology,
HH	Household	MRDEA	Medical Rehabilitation for Persons with Disabilities in Earthquake Affected Areas
HLV	Hazard, Livelihood and Vulnerability	MSA	Maritime Security Agency
HR	Human Resource	MTO	Mechanical Transport Officer
HRDP	Humana Resource Development Plan	MWG	Ministerial Working Group
H.R.P.T.	High Resolution Digital Telemetry	MWP	Ministry of Water and Power
H&WM	Hydrology and Water Management Organization	NA	Northern Areas
IBR	Institution-Based Rehabilitation	NASA	U.S. National Aeronautics and Space Administration
IBDR	International Bank for Reconstruction and Development	NCA	National Command Authority
ICID	International Commission on Irrigation and Drainage	NDMA	National Disaster Management Authority
ICOLD	International Commission on large Dams	NDMC	National Disaster Management Commission
ICT	Islamabad Capital Territory	NDMO	National Disaster Management Ordinance
IDB	Islamic Development Bank	NDMF	National Disaster Management Fund
IESCO	Islamabad Electrical Supply Company	NDMP	National Disaster Management Plan
IFAS	Integrated Flood Analysis System	NDRF	National Disaster Management Force
IFRC	International Federation of Red Cross	NDRMF	National Disaster Risk Management Framework
IIEES	International Institute of Earthquake Engineering and Seismology	NDRP	National Disaster Response Plan
IIMI	International Irrigation Management Institute	NEC	National Economic Council
INGOs	International Non-governmental Organizations	NEOC	National Emergency Operations Centre
IPC	Inter-Provincial Coordination	NESPAK	National Engineering Services of Pakistan
IPCC	<a href="http://www.ipcc.ch/">http://www.ipcc.ch/</a>	NESPC	National Engineering Services Pakistan
IPP	Independent Power Producers	NFPP	National Flood Protection Plans
IRSA	Indus River System Authority	NGDC	National Geographical Data Center
ISDR	International Strategy for Disaster Reduction	NGOs	Non-governmental Organizations
IT	Information Technology	NHA	National Housing Authority
IT/R	Interim Report	NIDM	National Institute of Disaster Management
JBIC	Japan Bank for International Cooperation	NIO	National Institute of Oceanography
JICA	Japan International Cooperation Agency	NLC	National Logistics Cell
JMA	Japan Meteorological Agency	NPO	Nonprofit Organization
JPs	Joint Programs	NSC	National Steering Committee
JPCs	Joint Program Components	NSMC	National Seismic Monitoring Centre
KESC	Karachi Electricity Supply Corporation	NSPP	National School of Public Policy
KFW	Kreditanstalt für Wiederaufbau, (meaning Reconstruction Credit Institute (German government-owned development bank))	NWFC	National Weather Forecast Centre
KP	Khyber Pakhtunkhwa	NWFP	North West Frontier Province
KMC	Knowledge Management Cell	NWP	Numerical Weather Prediction
K MGM	Knowledge Management	OC	Oriental Consultants Co., Ltd.
Las	Local Authorities	ODA	Official Development Assistance
LFFFC	Local Flash Flood Forecasting Centres	OIC	OYO International
LGRD	Local Government and Rural Development	Ops	Operations
MAC	Management Advisory Committee	PAEC	Pakistan Atomic Energy Commission
MAF	Million Acre Feet	PARC	Pakistan Agriculture Research Council
		PC&WD	Provincial Communication and Works Department

PCATAP	Pakistan Council of Architects and Town Planners	SRC	Space Research Council
PCIW	Pakistan Commissioner for Indus Waters	SRS	Satellite Remote Sensing
PCRWR	Pakistan Council of Research in Water Resources	SSPM	Special Secretary to the Prime Minister
PDMA	Provincial Disaster Management	SUPARCO	Space and Upper Atmospheric Research Corporation
P&D	Planning and Development Authority	TC	Tropical Cyclone
PDMC	Provincial Disaster Management Commission	TCMC	Tropical Cyclone Monitoring Centre
PEC	Pakistan Engineering Council	TCP/IP	Transmission Control Protocol/Internet Protocol
PEER	Program for Enhancement of Emergency Response	TCWC	Tropical Cyclone Warning Centre
PEMRA	Pakistan Electronic Media Regulation Authority	TDF	Tarbela Development Fund
PEOC	Provincial Emergency Operations Centre	TMA	Tehsil Municipal Administration
PEPAC	Pakistan Environmental Planning and Architectural Consultants Limited	TMO	Tehsil Municipal Officer
PEPCO	Pakistan Electric Power Company	TOT	Training of Trainers
PERRA	Provincial Earthquake Reconstruction and Rehabilitation Agency	TRC	Transnational Relief Cell
PICU	Project Implementation Coordination Unit	TS	Technical Services
PID	Provincial Irrigation and Power Department	TV	Television
PIDA	Provincial Irrigation and Drainage Authority	UAN	Universal Access Number
P&Imp	Planning and Implementation	UC	Union Council
PIPD	Provincial Irrigation and Power Department	UCDMC	Union Council Disaster Management Committee
PM	Prime Minister	UCERT	Union Council Emergency Response Team
PMD	Pakistan Meteorological Department	UN	United Nations
PMF	Probable Maximum Flood	UNDP	United Nations Development Program
PRCS	Pakistan Red Crescent Society	UNEP	United Nations Environment Program
PSO	Personal Staff Officer	UNESCO	United Nations Educational, Scientific and Cultural Organization
PSPM	Principal Secretary to the Prime Minister	UTC	Universal Time, Coordinated
PTA	Pakistan Telecommunication Authority	VCA	Vulnerability and Capacity Assessment
PTCL	Pakistan Telecommunication Company Limited	WAPDA	Water and Power Development Authority
PWDs	Persons with Disabilities	WASA	Water and Sanitation Agency
QPM	Quantitative Precipitation Measurement	WASH	Water, Sanitation and Hygiene
R&D	Research and Development	WB	World Bank
R&R	Roles & Responsibilities	WCAP	Water Sector Capacity Building and Advisory Services Project.
RBC	Reinforced Brick Concrete	WCDR	World Conference on Disaster Reduction
RCC	Reinforced Cement Concrete	WEC	World Engineering Council
RDFD	Routine Daily Flood Forecast	WFP	World Food Plan
RDMC	Regional Drought Monitoring Center	WMO	World Meteorological Organization
REDIM	Regional Drought Identification Model	XEN	Executive Engineer
RFFWC	Regional Flood Forecasting and Warning Centres		
SARSAT	Search And Rescue Satellite-Aided Tracking		
S&S	Support and Services		
SCARP	Salinity Control and Reclamation Project		
SERRA	State Earthquake Reconstruction and Rehabilitation Agency		
SDMA	State Disaster Management Authority		
SLMP	Sustainable Land Management Project		
SMA	Senior Management Advisor		
SMRFC	Specialized Medium Range Forecasting Centre		
SO	Section Officer		
SOE	Standard Operating Environment		
SOPs	Standard Operating Procedures		
SPC	Special Projects Cell		
SPI	Standard Precipitation Index		
SPU	Strategic Planning Unit		

## LIST OF BASIC TERMS

### **Acceptable risk**

The level of loss a society or community considers it can live with and for which it does not need to invest in mitigation

### **Biological hazard**

Biological vectors, micro-organisms, toxins and bioactive substances, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

### **Capacity**

A combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster.

Capacity may include physical, institutional, social or economic means as well as skilled personnel or collective attributes such as leadership and management. Capacity may also be described as capability.

### **Capacity building**

Efforts aimed to develop human skills or societal infrastructure within a community or organization needed to reduce the level of risk. In extended understanding, capacity building also includes development of institutional, financial, political and other resources, at different levels of the society.

### **Climate change**

The climate of a place or region is changed if over an extended period (typically decades or longer) there is a statistically significant change in measurements of either the mean temperature or variability of the climate for that region.

### **Coping capacity**

The means by which people or organizations use available resources and abilities to face a disaster. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions.

### **Disaster**

A serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources. It results from the combination of hazards, conditions of vulnerability and insufficient capacity to reduce the potential negative consequences of risk.

### **Disaster risk management (DRM)**

The comprehensive approach to reduce the adverse impacts of a disaster. DRM encompasses all actions taken before, during, and after the disasters. It includes activities on mitigation, preparedness, emergency response, recovery, rehabilitation, and reconstruction.

### **Disaster risk reduction/disaster reduction**

The measures aimed to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development.

### **Early warning**

The provision of timely and effective information, through identified institutions, to communities and individuals so that they could take action to reduce their risks and prepare for effective response.

### **Emergency management**

The management and deployment of resources for dealing with all aspects of emergencies, in particularly preparedness, response and rehabilitation

### **Forecast**

Estimate of the occurrence of a future event (UNESCO, WMO). The is term is used with different meanings in different disciplines.

### **Geological hazard**

Natural earth processes that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. For example earthquakes, tsunamis, volcanic activity and emissions, landslides, rockslides, rock falls or avalanches, surface collapses, expansive soils and debris or mud flows.

### **Hazard**

potentially damaging physical event or phenomenon that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Hazards can include natural (geological, hydro meteorological and biological) or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity, frequency and probability.

### **Hazard analysis**

Identification, studies and monitoring of any hazard to determine its potential, origin, characteristics and behavior.

### **Land-Use planning**

Branch of physical and socio-economic planning that determines the means and assesses the values or limitations of various options in which land is to be utilized, with the corresponding effects on different segments of the population or interests of a community taken into account in resulting decisions. Land-use planning can help to mitigate disasters and reduce risks by discouraging high-density settlements and construction of key installations in hazard-prone areas, control of population density and expansion

Mitigation Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.

### **Natural hazards**

Natural processes or phenomena occurring on the earth that may constitute a damaging event. Natural hazards can be classified by origin namely: geological, hydro meteorological or biological. Hazardous events can vary in magnitude or intensity, frequency, duration, area of extent, speed of onset, spatial dispersion and temporal spacing.

### **Preparedness**

Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.

### **Prevention**

Activities to ensure complete avoidance of the adverse impact of hazards.

### **Public awareness**

The processes of informing the general population, increasing levels of consciousness about risks and how people can reduce their exposure to hazards. This is particularly important for public officials in fulfilling their responsibilities to save lives and property in the event of a disaster.

### **Recovery**

Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk.

### **Relief / response**

The provision of assistance during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.

### **Resilience / resilient**

The capacity of a community, society or organization potentially exposed to hazards to adapt, by resisting or changing in order to maintain an acceptable level of functioning. Resilience can be increased by learning from past disasters for better future protection and to improve risk reduction measures.

### **Retrofitting (or upgrading)**

Reinforcement of existing buildings and structures to become more resistant and resilient to the forces of natural hazards.

### **Risk**

The chances of losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between hazards and vulnerable social conditions. Risk is expressed as Risk = Hazards x Vulnerability. Some experts also include the concept of exposure to refer to the physical aspects of vulnerability.

### **Risk assessment/analysis**

A methodology to determine the nature and extent of risk by analyzing potential hazards and evaluating existing vulnerability that could pose a potential threat to people, property, livelihoods and the environment.

**Structural/ non-structural measures**

Structural measures refer to any physical construction to reduce or avoid possible impacts of hazards, which include engineering measures and construction of hazard-resistant and protective structures and infrastructure.

Non-structural measures refer to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk and related impacts.

**Sustainable development**

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and the future needs. (Brundtland Commission, 1987).

**Technological hazards**

Danger originating from technological or industrial accidents, infrastructure failures or certain human activities, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Some examples: industrial pollution, nuclear activities and radioactivity, toxic wastes, dam failures; transport, explosions, fires, spills.

**Vulnerability**

The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community or society to the impact of hazards.

**Wildland fire**

Any fire occurring in vegetation areas regardless of ignition sources, damages or benefits.



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## Executive Summary

### National Disaster Management Plan (Main Plan)

#### 1. National Disaster Management System

The West Pakistan National Calamities Act of 1958 provides for the maintenance and restoration of order in areas affected by calamities and relief against such calamities and focuses on emergency response. Based on the Act, an Emergency Relief Cell was created within the Cabinet Division in 1971 and has been responsible for disaster relief at the national level. The Government of Pakistan promulgated the National Disaster Management Ordinance in 2007 (the Ordinance) in order to establish a National Disaster Management System in the country. The Ordinance became the Act called the National Disaster Management Act in December 2010. The Ordinance (now Act) established three levels for the disaster management system: i.e., national, provincial and district levels. At the national level, the National Disaster Management Commission (NDMC) was established, which has the responsibility for laying down policies and guidelines for disaster risk management and for approval of the National Plan. The National Disaster Management Authority (NDMA) was created in 2007 as the executive arm of the NDMC and serves as the implementing, coordinating and monitoring body for disaster risk management at the national level.

Along with the Ordinance (now Act), the National Disaster Risk Management Framework (NDRMF) was prepared by the NDMA in March 2007. The NDRMF served as an overall guideline for disaster risk management at national, provincial and district levels. In March 2010, the NDMA formulated the National Disaster Response Plan (NDRP), which presents emergency response activities for all stakeholders including Standard Operation Procedures (SOPs) of emergency response.

#### 2. The National Disaster Management Plan

The National Disaster Management Plan (NDMP), prepared based on the Act, aims at enhancing the capacity of the country to prepare for and respond to disasters (floods, earthquakes, tsunamis, droughts, sediment disasters, avalanches, GLOFs, cyclones with storm surges, etc.) by defining the measures to be considered necessary for disaster management. The NDMP identifies the roles and responsibilities of the stakeholders, including federal, provincial and district governments, community organizations, NGOs, businesses, and residents who are involved in the disaster management. Disaster management is one of the most important administrative measures for protecting the land and people's lives, welfare and property from disasters.

#### 3. Vision

To achieve sustainable social, economic and environmental development in Pakistan through reducing disaster risks and vulnerabilities, particularly those of the poor and marginalized groups of people in the country; and to enhance country's ability to manage all disasters (floods, earthquakes, tsunamis, droughts, landslides, sediment disasters, avalanches, GLOFs, cyclones with storm surges, etc.) using a comprehensive national approach.

#### 4. Mission

To manage the complete spectrum of disasters by development of disaster risk reduction policies, strategies, measures and actions of all stakeholders, especially at the national level; and to enhance institutional capacities, and human and material resources for mitigation, prevention and preparedness, response and recovery in disasters.

## **5. Objectives**

The objectives of the NDMP are:

- i) To develop resilience in society against disasters that Pakistan has experienced in the past, such as the 2005 Earthquake and floods of 2010 and 2011.
- ii) To mitigate damages from recurring disasters such as floods, urban flooding, earthquakes, tsunamis, droughts, landslides, sediment disasters, avalanches, GLOFs, cyclones with storm surges, etc.
- iii) To reduce disaster risks and vulnerabilities, particularly those of the poor and the marginalized groups of people in the country.
- iv) To clarify the roles and responsibilities of the national and local governments, public agencies, corporations, NGOs, communities and residents to reduce disaster risk.

## **6. Disaster Risk Management Approach**

According to the National Disaster Management Act 2010, the National Plan should include the following:

- Measures to be taken for the prevention of disasters and/or the mitigation of their effects.
- Actions to be taken for the integration of mitigation measures in the development plans.
- Measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situation or disaster.
- Roles and responsibilities of different Ministries or Divisions of the federal government in respect of measures specified above.

The National Plan has been organized/based on three stages: (i) pre-disaster including mitigation and preparedness measures, (ii) during disaster including emergency rescue, response and relief measures, and (iii) post-disaster including recovery, rehabilitation and reconstruction measures.

## **7. Disaster Reduction Measures**

In order to reduce disaster damage, there must be a close combination of three types of measures:

"self-help efforts" rooted in the awareness of people and corporations, "mutual-help efforts" of community-based organizations and NGOs, and "public-help efforts" made by national, provincial and local governments. These three types of measures are essential in all stages of the disaster cycle.

## **8. Hazard Analysis**

A hazard is a potentially damaging physical event or phenomenon that may cause the loss of life or injury, property damage, social and/or economic disruption or environmental degradation. Hazards can include natural (geological, hydro meteorological and biological) phenomena or those induced by human processes (biological, environmental and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity, frequency and probability.

Pakistan is one of the most vulnerable countries to natural disasters since it has great variety in terms of topography and meteorology throughout the country. Among all types of natural disasters, Pakistan has experienced floods most frequently, which have caused huge losses to human lives and damage to properties. Earthquakes have also caused severe damage in the country, especially in the northern region. Drought has caused significant loss of crops and affected a large number of people. Over the last few years, Pakistan has experienced some unprecedented and devastating disasters in the form of drought during 1998-2002 due to extremely low rainfall, the 2005 Earthquake, countrywide floods in 2010 and 2011 flooding in Sindh due to an abnormal monsoon rain pattern. These disasters have manifested Pakistan's vulnerability to disaster risks. Furthermore, recent climate change and urbanization has increased the vulnerabilities of Pakistani society to natural disasters. All these climate change trends have been very well identified by the IPCC reports.



## 9. National Policies and Strategies for Disaster Management

Key issues for disaster management in Pakistan include:

- 1) Strengthen disaster management administration at the national, provincial and local levels.
- 2) Enhance the disaster management system in the stages of pre-, during and post-disaster periods.
- 3) Establish mechanisms for monitoring and assessment of disaster risks.
- 4) Promote mechanism for mainstreaming disaster risk reduction measures into development planning processes.
- 5) Promote disaster risk management at local and community levels.
- 6) Strengthen capacity of all relevant players in disaster management.

The NDMP, in line with Hyogo Framework for Action (HFA), envisages ten (10) disaster management interventions to establish an efficient and effective disaster management system in Pakistan through forty two (42) strategies and one hundred eighteen (118) proposed priority actions/programs. These policies are:

### Intervention-1:

Establish the institutional and legal system for disaster management.

### Intervention-2:

Prepare disaster management plans at various levels.

### Intervention-3:

Establish national hazard and vulnerability assessment.

### Intervention-4:

Establish multi-hazard early warning systems.

### Intervention-5:

Promotion of training, education and awareness in relation to disaster management.

### Intervention-6:

Strengthen the awareness program on disaster risk reduction at the local level.

### Intervention-7:

Infrastructure development for disaster risk reduction.

### Intervention-8:

Mainstreaming disaster risk reduction into development.

### Intervention-9:

Establish a national emergency response system.

### Intervention-10:

Capacity development for post-disaster recovery.

The time frame for implementation of the above Interventions, over the next ten years (2012-2022) under the overall NDMP (Main Plan, Vol.-I to Vol.-III) have been identified as shown in Table 1 whereas Priority Actions/Programs under the Main Plan including Cost are shown in Table 2. The policies are guidelines covering all actions raised in the Hyogo Framework for Action as illustrated in Table 3. Intervention-wise strategies and proposed priority actions/programs to be undertaken by the responsible organizations are given in Table 4 to Table 13.

Table 1 Priority Actions/Programs for the Next Ten Years (2012-2022)

Strategy	app. Cost (million USD)	Time Frame									
		Phase 1				Phase 2			Phase 3		
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>4.1 Intervention-1: Establish the Institutional and Legal System for Disaster Management</b>											
1. Establish and function disaster management organizations at national, provincial and district levels.	2.0										
2. Formulate disaster management operation plans for relevant organizations.	0.2										
3. Implement periodic meetings among the disaster management organizations to monitor the situations.	0.1										
4. Implement drills and training of disaster management activities in the organizations to improve their capacities.	-										
<b>4.2 Intervention-2: Prepare Disaster Management Plans at Various Levels</b>											
1. Formulate and update disaster management plans at national, provincial, district and community or TMA levels.	1.0										
2. Develop hazard specific contingency plans.	1.0										
3. Develop sectoral disaster risk management operation in federal ministries, departments and authorities.	1.0										
<b>4.3 Intervention-3: Establish national hazard and vulnerability assessment</b>											
1. Conduct detailed multi-hazard vulnerability and risk analysis/assessments at national level	14.0										
2. Conduct detailed multi-hazard vulnerability and risk analysis/assessments at local level	5.0										
3. Conduct research and studies on impact of climate change on glaciers and ice cap	5.0										
<b>4.4 Intervention-4: Establish multi-hazard early warning and evacuation systems</b>											
1. Strengthen forecasting and early warning systems	168.5										
2. Prepare hazard maps at local scale in targeted locations	5.7										
3. Strengthen early warning dissemination systems	3.1										
4. Develop capacity of early warning and evacuation systems	11.2										
<b>4.5 Intervention-5: Promotion of training, education and awareness in relation to disaster management</b>											
1. Develop NIDM (National Institute of Disaster Management) to promote human resource development in the field of disaster management.	20.7										
2. Enhance the capacity of government agencies in charge of disaster management.	12.9										
3. Promote mainstreaming DRR through capacity enhancement of governmental officers.	2.6										
4. Develop the capacity of communities to cope with disasters.	26.2										
5. Raise people's awareness of disaster management.	1.9										
<b>4.6 Intervention-6: Strengthen awareness program on disaster risk reduction at local level</b>											
1. Enhance knowledge on disasters management in the general public	1.0										
2. Establish safe evacuation places in the case of disaster situation	10.0										
3. Implement and disseminate CBDRM activities	1.0										
4. Disseminate self help and mutual help efforts in disaster management	1.0										
5. Establish disaster mitigation measures incorporated with existing development program	1.0										
<b>4.7 Intervention7: Infrastructure development for disaster risk reduction</b>											
1. develop schools, hospitals and other important public facilities with safe against disasters	100.0										
2. Protect important coastal facilities against disasters taking into account climate change	21.0										
3. Enforce the building code in construction of buildings	10.0										
4. Implement appropriate structural measures in flood prone areas taking into account comprehensive and integrated flood management plans	565.6										
5. Enhance disaster risk management capacity in urban areas	11.0										
<b>4.8 Intervention-8: Mainstreaming disaster risk reduction into development</b>											
1. Establish disaster risk reduction policies in National Development Plan and National Poverty Reduction Strategy	-										
2. Set up sectoral guidelines on mainstreaming disaster risk reduction	1.0										
3. Establish criteria to assess development projects from a risk reduction perspective	0.2										
4. Improve technical capacity of federal and provincial governments to integrate risk reduction into development plans and programs	-										
<b>4.9 Intervention-9: Establish national emergency response system</b>											
1. Establish and strengthen warehouse or stockpiling system for storing food, medicine, relief supplies and rescue equipments at strategic locations	10.0										
2. Enhance emergency response capacities, such as emergency operation centers, Civil Defence and urban search and rescue teams in major cities.	10.0										
3. Establish a robust communication system and efficient transport and logistics mechanism to be used during emergency situations.	6.0										

1USD=88.4PKR

Table 2 Priority Actions/Programs/Cost of NDMP (Main Plan) for the Next Ten Years (2012-2022)

Strategy	app. Cost (million USD)	Time Frame									
		Phase 1				Phase 2			Phase 3		
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>4.1 Intervention-1: Establish the Institutional and Legal System for Disaster Management</b>											
1. Establish and function disaster management organizations at national, provincial and district levels.	2.0										
2. Formulate disaster management operation plans for relevant organizations.	0.2										
3. Implement periodic meetings among the disaster management organizations to monitor the situations.	0.1										
4. Implement drills and training of disaster management activities in the organizations to improve their capacities.	-										
<b>4.2 Intervention-2: Prepare Disaster Management Plans at Various Levels</b>											
1. Formulate and update disaster management plans at national, provincial, district and community or TMA levels.	1.0										
2. Develop hazard specific contingency plans.	1.0										
3. Develop sectoral disaster risk management operation in federal ministries, departments and authorities.	1.0										
<b>4.3 Intervention-3: Establish national hazard and vulnerability assessment</b>											
1. Conduct detailed multi-hazard vulnerability and risk analysis/assessments at national level	14.0										
2. Conduct detailed multi-hazard vulnerability and risk analysis/assessments at local level	5.0										
3. Conduct research and studies on impact of climate change on glaciers and ice cap	5.0										
<b>4.7 Intervention7: Infrastructure development for disaster risk reduction</b>											
1. develop schools, hospitals and other important public facilities with safe against disasters	100.0										
2. Protect important coastal facilities against disasters taking into account climate change	21.0										
3. Enforce the building code in construction of buildings	10.0										
4. Implement appropriate structural measures in flood prone areas taking into account comprehensive and integrated flood management plans	565.6										
5. Enhance disaster risk management capacity in urban areas	11.0										
<b>4.8 Intervention-8: Mainstreaming disaster risk reduction into development</b>											
1. Establish disaster risk reduction policies in National Development Plan and National Poverty Reduction Strategy	-										
2. Set up sectoral guidelines on mainstreaming disaster risk reduction	1.0										
3. Establish criteria to assess development projects from a risk reduction perspective	0.2										
4. Improve technical capacity of federal and provincial governments to integrate risk reduction into development plans and programs	-										
<b>4.9 Intervention-9: Establish national emergency response system</b>											
1. Establish and strengthen warehouse or stockpiling system for storing food, medicine, relief supplies and rescue equipments.at strategic locations	10.0										
2. Enhance emergency response capacities, such as emergency operation centers, Civil Defence and urban search and rescue teams in major cities.	10.0										
3. Establish a robust communication system and efficient transport and logistics mechanism to be used during emergency situations.	6.0										
4. Develop and implement emergency response plans in relevant ministries and departments at federal, provincial and district levels	5.0										
5. Establish an National Disaster Management Fund to enable the federal government to organize emergency response effectively.	-										
<b>4.10 Intervention-10: Capacity Development for Post Disaster Recovery</b>											
1. Prepare guidelines for post disaster recovery programs and activities	1.0										
2. Develop capacity of stakeholders in post disaster recovery	3.0										
3. Develop system and methodology for recovery needs assessment	1.0										
<b>Total Cost (million USD)</b>	<b>774.10</b>										
<b>Total Cost (billion PKR)</b>	<b>68.43</b>										

1USD=88.4PKR

**Table 3 The Relation between National Intervention and the Hyogo Framework**

Hyogo Framework for Action 2005-2015	National Intervention in Disaster Management
HFA-1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation	Intervention-1: Establish the institutional and legal system for disaster management
	Intervention-2: Prepare disaster management plans at various levels
HFA-2: Identify, assess and monitor disaster risks and enhance early warning	Intervention-3: Establish a national hazard and vulnerability assessment
	Intervention-4: Establish a multi-hazard early warning system
HFA-3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels	Intervention-5: Promotion of training, education and awareness in relation to disaster management
	Intervention-6: Strengthen awareness program on disaster risk reduction at local level
HFA-4: Reduce the underlying risk factors	Intervention-7: Infrastructure development for disaster risk reduction
	Intervention-8: Mainstreaming disaster risk reduction into development
HFA-5: Strengthen disaster preparedness for effective response at all levels	Intervention-9: Establish a national emergency response system
	Intervention-10: Capacity development for post-disaster recovery

**Table 4 Intervention-1: Establish the Institutional and Legal System for Disaster Management**

Strategies	Priority Actions / Programs	Responsible Organizations
1. Establish and function disaster management organizations at national, provincial and district levels	1.1. Promulgation of laws and regulations of disaster management	NDMA, F/G/S/PDMAs
	1.2. Provincial Disaster Management Commission and Authority are established and functioning	F/G/S/PDMAs
	1.3. District Disaster Management Authorities should be established and be functional	DDMA
	1.4. TMA and UC should recognize their roles and responsibilities in disaster management	TMA, UC
	1.5. Specific roles and responsibilities of each disaster management organization are recognized	NDMA, F/G/S/PDMAs, DDMA, TMA, UC
	1.6. NDMA follows the disaster management activities of disaster management organizations that are recognized by NDMC	NDMA
	1.7. Establishment of a disaster management organization in federal, provincial and district organizations	NDMA, F/G/S/PDMAs, DDMA
	1.8. Roles and responsibilities of the disaster management organizations are approved by NDMC	NDMC, PDMC
	1.9. Preparation of roles and responsibilities of TMA and UC	TMA, UC, DDMA
2. Formulate disaster management operation plans for relevant organizations	2.1. Formulation of disaster operation and contingency plans for each organization	NDMA, DDMA
	2.2. NDMA prepares the guidelines for disaster operation and contingency plans for disaster management organizations	NDMA
3. Implement periodic meetings among the disaster management organizations to monitor the situations	3.1. Periodic meetings should be held by NDMA to monitor the situations	NDMA, F/G/S/PDMAs, DDMA
4. Implement drills and training of disaster management activities in the organizations to improve their capacities	4.1. Implement drills and training and feed back to disaster operation and contingency plans	NDMA, F/G/S/PDMAs, DDMA
	4.2. Each disaster management organization implements drills and training based on its disaster operation and contingency plans	NDMA, F/G/S/PDMAs, DDMA

**Table 5 Intervention-2: Prepare Disaster Management Plans at Various Levels**

Strategies	Priority Actions / Programs	Responsible Organizations
1. Formulate/update disaster management plans at national, provincial, district and community or TMA levels	1.1. Revise and update provincial and district DMPs in light of lessons learned in the floods of 2010 and 2011.	NDMA, F/G/S/PDMAs, DDMAAs
	1.2. Develop district DMPs in remaining districts	F/G/S/PDMAs, DDMAAs
	1.3. Develop community-based DMPs at TMA level	F/G/S/PDMAs, DDMAAs
2. Develop hazard specific contingency plans	2.1. Develop hazard specific contingency plans at national and provincial levels	NDMA, F/G/S/PDMAs, Federal Ministries, Department and Authorities
3. Develop sectoral disaster risk management operational plans in federal ministries, department and authorities	3.1. Develop sectoral disaster management operational plans in federal ministries, departments and authorities	NDMA, Federal Ministries, Department and Authorities
	3.2. Develop detailed roles and responsibilities of federal ministries, departments and authorities in disaster management	NDMA, Federal Ministries, Department and Authorities

**Table 6 Intervention-3: Establish a National Hazard and Vulnerability Assessment**

Strategies	Priority Actions / Programs	Responsible Organizations
1. Conduct detailed multi-hazard vulnerability and risk analysis/assessments at national level	1.1. Preparation of vulnerability atlas*1 at the national level	NDMA in association with F/G/S/PDMAs, DDMA, FFC, PMD, GSP and ERRA
	1.2. Digitization of vulnerability atlas and the preparation of database	NDMA and F/G/S/PDMAs
2. Conduct detailed multi-hazard vulnerability and risk analysis/assessments at local levels	2.1. Preparation of vulnerability analysis and creation of hazard maps for selected districts and cities*2	NDMA in association with F/G/S/PDMAs, DDMA, FFC, PMD, GSP and ERRA
	2.2. Digitization of vulnerability/hazard maps and the preparation of database	NDMA and F/G/S/PDMAs
3. Conduct research and studies on impact of climate change on glaciers and ice caps	3.1. Conduct research on impact of climate change on glaciers and ice caps	WAPDA, PMD, FFC and GCISC in coordination with NDMA
	3.2. Establishment of GLOF early warning system for selected vulnerable areas	PMD in association with NDMA, FFC and WAPDA

Note \*1: Vulnerability Atlas refers to the hazard and risk maps for targeted disasters.

\*2: As the local levels to be targeted, districts vulnerable to disasters and high economic and densely populated major cities with high disaster vulnerabilities (based on the disaster experiences in the past) are prioritized. Thus, Karachi, Hyderabad, Faisalabad, Gujranwala, Sialkot, Peshawar, Lahore and ICD with their suburbs shall be included for the city level.

On the other hand, micro hazard (risk) maps shall be prepared for the most vulnerable locations for each disaster, such as Indus River floods, flash floods by nullahs, and landslides through projects to be undertaken by each responsible agency

**Table 7 Intervention-4: Establish a Multi-hazard Early Warning System**

<b>Strategies</b>	<b>Priority Actions /Programs</b>	<b>Responsible Organizations</b>
1. Strengthen forecasting and early warning systems	1.1. Establishment of a specialized medium range forecasting centre (SMRFC) with the meteorological radar station at Islamabad, upper air observations at designated locations	PMD
	1.2. Strengthening of flood forecasting by satellite information and hazard maps of Indus River	PMD/FFC/SUPARCO
	1.3. Establishment of a river flood forecast and warning system, including establishment of regional flood forecasting and warning centres (RFFWC)	PMD/WAPDA in consultation with NDMA/ F/G/S/PDMAs
	1.4. Establishment of a flash flood forecasting and warning system including local flash flood forecasting centres (LFFFC)	PMD in consultation with NDMA/ F/G/S/PDMAs
	1.5. Establishment of landslide forecast and warning system	PMD in consultation with NDMA/ F/G/S/PDMAs
	1.6. Establishment of a new tide level monitoring network including a data communication system	PMD
	1.7. Establishment of a GLOF and snow melt flash flood forecast and warning system with an avalanche advisory information system	PMD/WAPDA
	1.8. Establishment of a seismic intensity reporting system including a data communication system	PMD
	1.9. Establishment of a meteorological radar system along coastal areas	PMD
	1.10. Establishment of a meteorological radar system at designated locations	PMD
	1.11. Replacement of the meteorological radar systems at D.I. Khan, R.Y. Khan and Karachi	PMD
	1.12. Expansion and additional installation of an automatic weather observation system (AWS)	PMD in consultation with NDMA/ F/G/S/PDMAs
	1.13. Expansion of the real-time rainfall & water level observation network	PMD
2. Prepare hazard maps at local scale in targeted locations	2.1. Preparation of hazard maps and capacity development against local flash floods in vulnerable areas	PMD/FFC
	2.2. Preparation of landslide hazard maps based on the topographical and geological analysis at vulnerable locations	PMD/FFC GSP/NDMA
	2.3. Training on tsunami simulation and preparation of hazard maps	PMD /NDMA/ F/G/S/PDMAs /D DMA/Related Agencies
3. Strengthen early warning dissemination system	3.1. Innovation of the communication system between PMD and NDMA, and among DDMA (NDMA-PDMA-DDMA) and a communication system utilizing cellular phone and radio broadcast networks	NDMA/ F/G/S/PDMAs /DDMA/PMD/PID/ NGOs/PTA/PEMR A/Local Governments
	3.2. Development of the EWS National Plan, Guidelines and SOPs for Health Emergency Preparedness and Response (HEPR)	NDMA/ F/G/S/PDMAs Ministry of Health
	3.3. Weather information broadcasting system and weather information broadcasting program production system and installation of GTS in SMRFC Project	PMD
	3.3. Finalization of SOP of cyclone EWS	PMD
4. Develop capacity of early warning and evacuation systems	4.1. Enhancement of research activities for snow/glacier/glacial lakes	PMD/GCISC /WAPDA
	4.2. Establishment of weather forecast guidance system	PMD
	4.3. Enhancement of community enlightenment for EWS with execution of training and drills	NDMA/ F/G/S/PDMAs /D DMAs/PMD/FFC/ NGOs
	4.4. Education program for advanced meteorology and hydrology for PMD staff	PMD

**Table 8 Intervention-5: Promotion of Training, Education and Awareness in Relation to Disaster Management**

Strategies	Priority Actions / Programs	Responsible Organizations
1. Develop NIDM (National Institute of Disaster Management) to promote human resource development in the field of disaster management	1.1. Setting up of organization of NIDM	NDMA
	1.2. Construction of NIDM	NDMA
	1.3. Enhancement of coordination and partnership with stakeholders	NIDM
	1.4. Systemization of DRM capacity building	Relevant organizations
	1.5. Improvement of DRM training quality	NIDM
	1.6. Establishment of library	NIDM
	1.7. Promotion of research	NIDM
2. Enhance the capacity of government agencies in charge of disaster management	2.1. DRM courses for NDMA, F/G/S/PDMAs, and DDMA staff	NIDM
	2.2. Capacity enhancement of urban search and rescue teams	City District Government
	2.3. Implementation of regular refresher training for district fire brigades	Provincial Fire Brigade, Provincial Civil Defence
	2.4. DRM workshops for TMA staff	NIDM, DDMA
3. Promote mainstreaming DRR through capacity enhancement of governmental officers	3.1. DRM workshops for relevant ministries	NIDM
	3.2. DRM workshops for relevant departments of provincial governments	
	3.3. DRM workshops for district governments	DDMA
	3.4. DRM subjects into curriculum of government training institutes	NIDM
4. Develop the capacity of communities to cope with disasters	4.1. DRM workshops for community leaders	DDMA, NGO
	4.2. Search and rescue training for members of community emergency response teams	District Fire Brigade, District Civil Defence, NGO
5. Raise people's awareness of disaster management	5.1. Awareness campaigns	NIDM, F/G/S/PDMAs, DDMA, TMAs
	5.2. Promotion of disaster education at schools	NIDM, Provincial Education Department
	5.3. Promotion of disaster education in higher education	NIDM, Provincial Education Department, University

**Table 9 Intervention-6: Strengthen Awareness Program on Disaster Risk Reduction at Local Level**

Strategies	Priority Actions / Programs	Responsible Organizations
1. Enhance knowledge of disaster management in the general public	1. Conducting awareness campaigns for the general public utilizing various media such as radio, TV, the Internet, posters, mosques, and schools	NDMA F/G/S/PDMAs
2. Establish safe evacuation places in the case of a disaster situation	2. Preparing evacuation maps for vulnerable districts	F/G/S/PDMAs Districts
3. Implement and disseminate CBDRM activities	3.1. Establishing special teams of trainers for CBDRM activities	NDMA F/G/S/PDMAs
	3.2. Preparing information site regarding CBDRM on NDMA web page for CBDRM practitioners	NDMA
	3.3. Calling for donors to conduct CBDRM activities	NDMA
4. Disseminate self-help and mutual help efforts in disaster management	4.1. Conducting standardized <sup>1</sup> CBDRM activities for Union Councils at vulnerable districts	NDMA F/G/S/PDMAs Districts
	4.2. Conducting standardized CBDRM activities for communities at vulnerable districts	NDMA F/G/S/PDMAs Districts
	4.3. Conducting standardized CBDRM activities for Union Councils at locations other than vulnerable districts	NDMA F/G/S/PDMAs Districts
	4.4. Installing equipment for disaster risk management at UC	NDMA F/G/S/PDMAs Districts
5. Establish disaster mitigation measures incorporated with the existing development program	5.1 Planning small scale mitigation measures during CBDRM activities	NDMA F/G/S/PDMAs Districts
	5.2 Mitigation measures for community DRM are incorporated in the local government development program	NDMA Provinces F/G/S/PDMAs Districts

<sup>1</sup> Management Committees and response teams are to be organized at Union Councils. For Union Council Disaster Management Committees, a 4-day training course is planned and key activities are DRM basic concepts, hazard vulnerability capacity assessment, mainstreaming DRR, early warning system, emergency management (first aid, evacuation, relief, etc.), situation analysis and reporting, damage and need assessments, and resource mobilization. For Union Council response teams, a 6-day training course is planned and the key activities are DRM basic concepts, emergency first aid, search & rescue, fire fighting, stockpile management, emergency management, and simulation exercises.



**Table 10 Intervention-7: Infrastructure Development for Disaster Risk Reduction**

Strategies	Priority Actions/Programs	Responsible Organizations
1. Develop schools, hospitals and other important public facilities to be safe against disasters	1.1. Structural vulnerability evaluation for schools and hospitals against earthquakes, tsunamis and floods in Pakistan	NDMA/ F/G/S/PDMAs /DDMAs
	1.2. Preparation of guidelines for new public building construction in the areas vulnerable to disasters	NDMA/ F/G/S/PDMAs /DDMAs
	1.3. Retrofitting works of important public facilities (schools and hospitals)	NDMA/ F/G/S/PDMAs /DDMAs Ministry of Education Ministry of Health
2. Develop important coastal facilities to be safe against disasters taking into account climate change	2.1. Construction of coastal dikes along major public facilities against tsunamis and storm surges (cyclones)	Ministry of Ports and Shipping
	2.2. Construction of DRM centres in vulnerable areas to disasters	NDMA/ F/G/S/PDMAs /DDMAs
3. Enforce the building code in construction of buildings	3.1. Preparation of guidelines for housing construction in the areas vulnerable to disasters	NDMA/ F/G/S/PDMAs /DDMAs
4. Implement appropriate structural measures in flood prone areas taking into account comprehensive and integrated flood management plans	4.1. Establishment of comprehensive and integrated flood management/protection plan in Pakistan <ul style="list-style-type: none"> <li>• A review of breaching mechanism of the river embankments (flood bunds) and a review of designated breaching points</li> <li>• Revision and updating of NFPP-IV</li> <li>• Revision of SOPs of Tarbela Dam for flood mitigation</li> <li>• Flood plain zoning and management</li> <li>• Capacity building of the stakeholders in flood mitigation</li> </ul>	FFC/PIDs/Pakistan Army  FFC/PIDs/WAPDA/PMD /Planning Commission FFC/WAPDA  FFC/PIDs/PDMAs FFC/PIDs/PMD/WAPDA
	4.2. Construction and rehabilitation of flood control/mitigation structures <ul style="list-style-type: none"> <li>• Implementation of NFPP-IV</li> <li>• Construction of DRM centres in flood prone areas</li> <li>• Retrofitting of existing dams, barrages and flood protection works to increase floodwater retarding capacity and ability to accommodate design discharges</li> <li>• Constructing of new flood protection works, dams and barrages to increase flood mitigation/protection capacity</li> </ul>	FFC/PID/WAPDA/PMDs /Planning Commission NDMA/ F/G/S/PDMAs /DDMAs FFC/PIDs/WAPDA/ Planning Commission  FFC/PID/WAPDA/ /Planning Commission
5. Enhance disaster risk management capacity in urban areas	5.1. Formulation of urban disaster management plan to propose corresponding countermeasures against natural hazard risk in the urban areas	NDMA/ F/G/S/PDMAs /DDMAs
	5.2. Enforcement of effective land use control and regulations based on urban disaster management plan; introduction of the space needed for evacuation and disaster relief into land utilization program	NDMA/ F/G/S/PDMAs /DDMAs Planning Commission
	5.3. Construction of DRM centres in areas vulnerable to urban disasters	NDMA/ F/G/S/PDMAs /DDMAs

**Table 11 Intervention-8: Mainstreaming Disaster Risk Reduction into Development**

<b>Strategies</b>	<b>Priority Actions / Programs</b>	<b>Responsible Organizations</b>
1. Establish disaster risk reduction policies in National Development Plan and National Poverty Reduction Strategy	1.1. Collect lessons learnt from pilot projects on mainstreaming DRM	NDMA, F/G/S/PDMAs, Planning Commission
	1.2. The National Development Plan and National Poverty Reduction Strategy should include disaster risk reduction as a national policy	NDMA, F/G/S/PDMAs, Planning Commission
	1.3. Disaster risk reduction is put into practice as pilot projects	NDMA, F/G/S/PDMAs, Planning Commission
2. Set up sectoral guidelines on mainstreaming disaster risk reduction	2.1. Undertake case studies on previous experiences of line ministries on mainstreaming DRR	NDMA, F/G/S/PDMAs, Planning Commission
3. Establish criteria to assess development projects from a risk reduction perspective	3.1. Conduct cost-benefit analysis of integrated risk reduction into development sectors	NDMA, F/G/S/PDMAs, Planning Commission
	3.2. Establish the evaluation criteria and guidelines for mainstreaming DRM into development projects	NDMA, F/G/S/PDMAs, Planning Commission
	3.3. Disseminate the evaluation criteria to federal and provincial governments through workshops and awareness programs	NDMA, F/G/S/PDMAs, Planning Commission
	3.4. Review the development programs by the criteria set by NDMA	NDMA, F/G/S/PDMAs, Planning Commission
4. Improve technical capacity of federal and provincial governments to integrate risk reduction into development plans and programs	4.1. Prepare curriculum of national and provincial workshops on mainstreaming DRM	NDMA, F/G/S/PDMAs, Planning Commission
	4.2. Hold workshops for sharing lessons learnt and experience	NDMA, F/G/S/PDMAs, Planning Commission

**Table 12 Intervention-9: Establish a National Emergency Response System**

Strategies	Priority Actions / Programs	Responsible Organizations
1. Establish and strengthen warehousing or stockpiling system for storing food, medicine, relief supplies and rescue equipment at strategic locations	1.1. Develop emergency operation centres at national, provincial and district levels	NDMA, F/G/S/PDMAs, DDMA
	1.2. Establish a database of resources and equipment for emergency response in relevant agencies	NDMA, F/G/S/PDMAs, DDMA
	1.3. Prepare emergency response plans for the major lifelines and critical facilities, such as telephone, electricity, health, and water supply	Ministry of Communication, Ministry of Water and Power
2. Enhance emergency response capacities, such as emergency operation centres, Civil Defence and urban search and rescue teams in major cities, response force in provinces/districts	2.1. A capacity development of professionals to undertake assessment of damage for the use of multiple stakeholders	NIDM
	2.2. Establish search and rescue teams to deal with multiple hazards in provincial and regional capitals and key industrial cities, response force in provinces/districts	NDMA, F/G/S/PDMAs, DDMA
	2.3. Strengthen training institutions of the Pakistan Civil Defence to train emergency responders	NDMA, Civil Defence
	2.4. Enhance emergency response capacities at the community level	TMA, UC
3. Establish a robust communication system, supply chain and efficient transport and logistics mechanism to be used during emergency situations	3.1. Establish a robust communication system that can be used during emergency situations	NDMA, Ministry of Information and Broadcasting, Ministry of Information and Technology
	3.2. Establish efficient supply chain, transport and logistics management mechanism	NEOC, Ministry of Communication
4. Develop and implement emergency response plans in relevant ministries and departments at federal, provincial and district levels	4.1. Refine standard operating procedures (SOP) for emergency response at national, provincial and district levels based on the experience of the 2010 Flood	NDMA, F/G/S/PDMAs, DDMA
	4.2. Implement the Program for Enhancement of Emergency Response (PEER)	NDMA in association with F/G/S/PDMAs
5. Establish a National Disaster Management Fund to enable the federal government to organize emergency response effectively	5.1. Establish a National Disaster Management Fund	NDMA in association with F/G/S/PDMAs

**Table 13 Intervention-10: Capacity Development for Post-Disaster Recovery**

Strategies	Priority Actions / Programs	Responsible Organizations
1. Prepare guidelines for post-disaster recovery programs and activities	1.1. Preparation of guidelines for the formulation of recovery and rehabilitation plans	NDMA, SPU in consultation with F/G/S/PDMAs
	1.2. Documents of lessons learnt regarding recovery from the Pakistan 2010 Flood by related agencies	NDMA, F/G/S/PDMAs/DDMAs and PMD/FFC
	1.3. Establishment of a funding system for post-disaster recovery and rehabilitation	NDMA, SPU in consultation with F/G/S/PDMAs
2. Develop capacity of stakeholders in post-disaster recovery	2.1. Holding of orientation workshops for line ministries and other stakeholders on post-disaster recovery program design and implementation	NDMA in association with F/G/S/PDMAs
	2.2. Database on technical capacity of relevant stakeholders in designing and implementing recovery programs	NDMA in association with F/G/S/PDMAs
	2.3. Set-up of a system to coordinate and monitor flood early recovery activities	NDMA, F/G/S/PDMAs, DDMA
	2.4. Capacity development of research activities for new techniques for recovery and rehabilitation	Research Institutes
3. Develop system and methodology for recovery needs assessment	3.1. Preparation of guidelines for recovery needs assessment and recovery program design and management for multiple sectors	NDMA, F/G/S/PDMAs, SPUs

## Human Resource Development Plan (Volume I)

The plan consists of three parts: Part I - Introduction, Part II - Comprehensive Human Resource Development Plan and Part III NIDM Operation Plan.

### PART I INTRODUCTION

#### 1. Background

Human resources are one of the most important factors to reduce disaster damage. However, the current human resource development activities do not systematically provide sufficient human resources in Pakistan and there is a big need for qualified human resources to boost disaster management. In order to provide direction for systematic human resource development in the field of disaster management, this Human Resource Development Plan (HRDP) has been developed. The HRDP is a supplemental document to other important documents regarding disaster management in Pakistan such as the National Disaster Management Act and the National Disaster Management Plan.

### PART II COMPREHENSIVE HUMAN RESOURCE DEVELOPMENT PLAN

#### 1. Framework of the Plan

**Vision:** To build a culture of safety and resilience at all levels utilizing knowledge, innovation and education.

**Goal:** To improve preparedness against disasters and to reduce disaster damage.

**Objective:** A system of human resource development required in the field of disaster management will be established and human resources that promote “self-help efforts,” “mutual-help efforts,” and “public-help efforts” will be developed with better coordination.

**Time frame:** Ten (10) years (2012 to 2022)

#### 2. Strategies

The following strategies will be adopted over the next ten years.

- Involvement of various organizations to implement the capacity building activities of stakeholder groups with good coordination;
- Emphasis on capacity building of main stakeholders groups;
- Development of a system of accumulation and sharing of research results and lessons learnt in the field of disaster management; and
- Fictionalization of NIDM as a national level focal organization for human resource development in the field of disaster management.

#### 3. Outputs and Activities

In order to achieve its objectives, HRDP is expected to produce the following five (5) outputs. Each output shall be produced through several activities shown below in Table 14.

**Table 14 Output and Activities of Comprehensive HRDP**

Output	Activity
1. NIDM takes initiative for improvement of human resources in the field of disaster management	1-1 Setting up of organization of NIDM
	1-2 Construction of NIDM Building Complex
	1-3 Enhancement of coordination and partnerships with national and international organizations in the field of disaster management
	1-4 Systematization of DR M capacity building in various organizations
	1-5 Improvement of DR M training quality through technical advisories
	1-6 Establishment of a library and disaster information Resource Centre (DIRC) specialized for disaster management
	1-7 Promotion of research in the field of disaster management
2. Capacity of governmental staff who are in charge of DRM is enhanced.	2-1 Implementation of D RM training courses for F/G/S/C/PDMAs and DDM As staff
	2-2 Capacity enhancement of urban search and rescue teams
	2-3 Implementation of regular refresher trainings for district fire brigades
	2-4 Implementation of D RM work shops for TM A staff
3. Capacity of staff of government offices related to disaster management is enhanced for mainstreaming D RR activities for their implementation.	3-1 Implementation of DRM work shops for relevant ministries
	3-2 Implementation of DRM work shops for relevant departments of provincial governments and state governments
	3-3 Implementation of DRM work shops for district governments
	3-4 Incorporation of DRM subjects into curriculum of government training institutes
4. Capacity of communities is	4-1 Implementation of DRM work shops for community leaders
	4-2 Search and rescue training for members of community emergency response teams
5. Individuals are aware of importance of DRM.	5-1 Implementation of awareness campaigns for the general public
	5-2 Promotion of disaster education at schools
	5-3 Implementation of DRM workshops for university students

### PART III NIDM OPERATION PLAN

#### 1. Goal and Objectives

**Goal:** To promote human resource development in the field of disaster management in diverse ways.

**Objectives:** To accelerate construction of the NIDM building complex (Step 1); to prepare the NIDM institution after the completion of the NIDM building complex; to increase the number of people who implement DRR through human resource development (Step 2).

**Time Frame:** Step 1 is from 2012 to 2016 (before NIDM is not fully operational) and Step 2 is after 2016 (after NIDM is fully operational).

#### 2. Strategies

There are two strategies as below.

- Preparation for the full operation of NIDM
- Strengthening the institutional capacity of NIDM

#### 3. Organizational Structure

Currently, the organizational structure of NIDM is not clear. Considering the roles and responsibilities regulated by the National Disaster Management Act, the proposed organizational structure is as shown below in Figure 1.

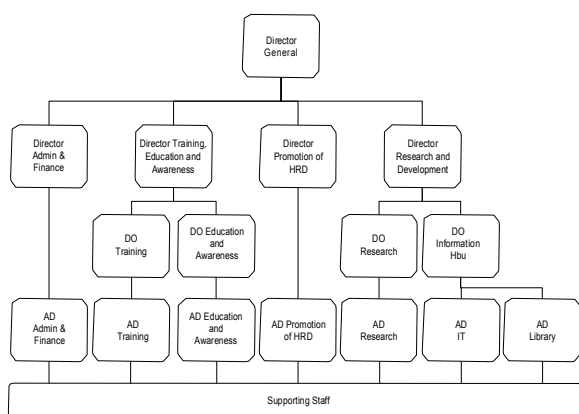


Figure 1 Proposed Organization Structure of NIDM

#### 4. Activities for the Next Ten Years (2012-2022)

In order to achieve the objectives, the sub-activities that need to be implemented step by step while the institutional capacity of NIDM is strengthened are given in Table 15.

Table 15 Sub-Activities

Training	
T-1	Training of NDMA staff
T-2	Training of F/G/S/PDMAs staff
T-3	Training of DDMA staff
T-4	Training of TMA staff through DDMA
T-5	Training of staff of Federal Ministries
T-6	Training of university students
Education	
E-1	Incorporation of disaster management subjects into curriculum of governmental staff general training
E-2	Promotion of disaster education in basic education
E-3	Promotion of disaster education in higher education
Awareness	
A-1	Holding of national disaster management exhibition, seminars, workshops, conferences etc.
A-2	Awareness campaign through media
Promotion of Comprehensive Human Resource Development	
P-1	Enhancement of coordination among organizations which conduct capacity building in the field of disaster management
P-2	Technical advisories and assistances for human resource development activities in the field of disaster management
Research	
R-1	Establishment and operation of a library and Disaster Information Resource Centre (DIRC)
R-2	Promotion of research in the field of disaster management

#### 5. Implementation Schedule

The implementation schedule of the sub-activities is shown in Figure 2 below. Programs and related cost under HRDP (Vol.-I) is in Table 16.

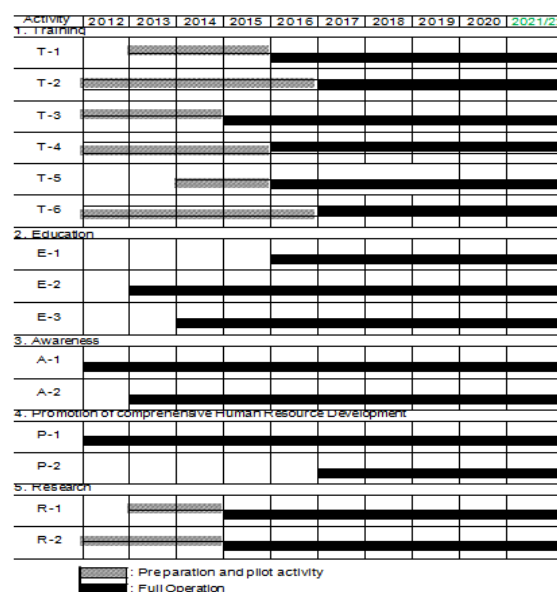


Figure 2 Implementation Schedule

**Table 16 HRDP Priority Actions/Programs/Cost for the Next Ten Years (2012-2022)**

Strategy	app. Cost (million USD)	Time Frame									
		Phase 1				Phase 2			Phase 3		
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>4.5 Intervention-5: Promotion of training, education and awareness in relation to disaster management</b>											
1. Develop NIDM (National Institute of Disaster Management) to promote human resource development in the field of disaster management.	20.7										
2. Enhance the capacity of government agencies in charge of disaster management.	12.9										
3. Promote mainstreaming DRR through capacity enhancement of governmental officers.	2.6										
4. Develop the capacity of communities to cope with disasters.	26.2										
5. Raise people's awareness of disaster management.	1.9										
<b>Total Cost (million USD)</b>	<b>64.30</b>										
<b>Total Cost (billion PKR)</b>	<b>5.68</b>										

1USD=88.4PK

## Multi-Hazard Early Warning System Plan (Volume II)

The Plan consists of two Parts. Part-I is an introduction and Part-II consists of the contents of Plan.

### PART I INTRODUCTION

#### 1. Background

Pakistan is vulnerable to natural disasters from a range of hazards including floods (river/flash /coastal floods and other floods due to storms and cyclones with storm surge), cyclones, droughts, earthquakes, glacial lake outburst floods (GLOFs), landslides, avalanches and tsunamis, together with appurtenant secondary disasters such as river erosion, waterborne diseases and epidemics after natural disasters, pest attacks, oil spills, forest fires, etc.

The need to establish multi-hazard early warning systems (EWSs) that decrease personal and economic damages by informing the populous of disasters in advance has become a serious consideration in recent years. Until now, however, technical efforts in multi-hazard EWS have often resulted in systems that are not fully functional for multiple reasons, e.g., inadequate human and technical capacities, insufficient cooperation among the agencies concerned, ignorance about the significance of EWS on the part of communities, and lack of experience-based know-how with no record of the historical or cultural background in areas of disaster prevention. For the reduction of vulnerabilities and risks to natural disasters, a multi-hazard EWS is proposed as the fundamental measure against floods, GLOFs and sediment disasters, including landslides, cyclones with storm surges, droughts and tsunamis.

#### 2. Vision/Goals of Multi-Hazard Early Warning System Plan

The vision of the Multi-Hazard EWS Plan is to reduce the vulnerability to natural disasters by enhancing and strengthening the early warning capacity against multiple hazards due to natural disasters so that the overall vision of formulation of the Disaster Management Plan will be

achieved. The Multi-Hazard EWS Plan shall support and lead each activity smoothly for early warning at the national level; whereas, the establishment of a Multi Hazard EWS is a condition precedent to the operation of mitigation systems against possible damage arising from the occurrence of natural calamities.

#### 3. Composition of the Multi-Hazard Early Warning System Plan

The structure of the multi-hazard early warning system plan consists of salient items as shown in Table 17.

**Table 17 Salient Items**

Salient Item	Section
Introduction	1.1 Introduction
	1.2 Hazards Targeted in the Proposed Multi-Hazard Early Warning System Plan
Goal of the Multi-hazard Early Warning System Plan	2.1 Vision and Goals of Multi-Hazard Early Warning System Plan
	2.2 Implementation Policy
Existing Conditions	3.1 Current Meteorological Observations and Common Policy of Alerts
	3.2 Current Seismic Observations
	3.3 Review on Current SOPs and Dissemination System
	3.4 Current Information and Communication System Situation
	3.5 Current Education System Situation regarding EWS in Pakistan
Planning Issue, Challenges, and Conceivable Projects	4.1 Introduction
	4.2 Summary of Hazard and Risk Assessment
	4.3 Planning Issues for Each Type of Disaster
	4.4 Dissemination System of Multi-Hazard Early Warning
	4.5 Required Human Resources Development
Planning Framework	5.1 Introduction
	5.2 Programs and Projects Proposed in the Multi-Hazard EWS Plan
	5.3 Prioritized Multi-Hazard EWS
	5.4 Proposed Implementation Scheme
Scope of Feasibility Study	6.1 Introduction
	6.2 General Scope of Feasibility Study
	6.3 ToR of the Feasibility Study on Multi-Hazard EWS in Pakistan

### PART II CONTENTS OF THE PLAN

#### 1. Implementation Policy

##### 1) Target Year

The target year for the establishment of the Multi-Hazard EWS Plan is set for 2022 (10 year implementation) with the framework subject to review every five years.

## 2) Basic Implementation Framework

The implementation of the Multi-Hazard EWS Plan has been categorized into the short to medium

term, long-term and other recognized super long-term projects. The short to medium projects shall consist of rehabilitation and new installation and/or establishment of new equipment, facilities and systems including social programs (CBDRM) urgently required within 2-3 years as the priority projects. The long-term projects shall also consist of strengthening and improvement or new establishment of equipment and facilities including the systems required within 6-7 years as priority projects with feasibility study to be executed. In addition, the plan framework, including super long-term projects, shall cover the overall Multi Hazard EWS projects or components proposed in this plan as shown in Table 18 below.

**Table 18 Target Year of Multi-Hazard EWS**

Plan	Year
Framework (Whole Plan)	2022
Short to Medium Term Projects/Studies	2015
Long Term Projects/Studies	2018
Interim Evaluation of Plan	2016

## 2. Planning Framework

### 1) Strategy

The strategies to be adopted for the Plan over the next ten years are given in Table 19 below.

**Table 19 Strategies for Multi-Hazard EWS**

No.	Strategy
Strategy 1	Strengthen weather forecasting and early warning systems
Strategy 2	Prepare hazard maps at local scale in targeted locations
Strategy 3	Strengthen early warning dissemination systems
Strategy 4	Develop capacity of early warning and evacuation systems

### 2) Relevant and Responsible Agencies

The activities for the Multi-Hazard Early Warning System should be executed with the involvement of a number of stakeholders so that effective operations resulting in numerous benefits are expected in the cycle of the whole system. In this regard, the agencies given in Table 20 below shall be involved.

**Table 20 Relevant and Responsible Agencies**

Category	Relevant and Responsible Agencies
Central Government	NDM A, FFC, PMD, WAPD A, GSP, PCIW, Army, NIO, IR SA, SUPARCO, ER R A, Planning Commission, MW P
Provincial Government	F/G/S/C/PDMAs, PIDs, Civil Defence, Rescue 1122 (Fire Brigades), Police, Department of Information / C &W/ H earth and Social Welfare
District Government	DDM As (D Cs/DCO s, Revenue Offices, etc.), Police, C &W, Civil Defence, TM As, CDG s, Tehsils, UC s
Others	NGOs, INGO s, Mosques, Schools, Media, PRCS

### 3) Basic Communication Routes

The warnings and alerts shall all be disseminated to related agencies and vulnerable districts (DDMAs) likely to be affected by the expected disasters. As basic policy, PMD and agencies observing essential data regarding disasters shall directly issue the warning(s) to DDMAs and other related agencies.

DDMAs to which the warnings are issued by PMD should disseminate the information on magnitudes and significance of anticipated hazards based on the District Disaster Management Plans (DDMPs) and contingency plan(s) for expected disaster(s) without any delay.

The media, particularly electronic media (TV and radio stations), should play an important role as disseminating agencies in the EWS. The media shall send warning messages in a ticker or news flash in accordance with the request from PMD and/or NDMA/ F/G/S/PDMAs /DDMAs.

### 4) Basic Communication Mode

The communication mode for all types of EWSs should be multiplexed to secure reliable communication and information between early warning agencies (PMD) and end users (communities and vulnerable persons).

The available modes should be adopted as much as possible. The main mode(s) for each EWS to be used are phone/fax, siren, the media (radio/TV), SMS, the Internet by virtual private network (VPN) and public address systems by CDMA, DDMAs, Civil Defence, Police, Fire Brigade, etc.

Basically, current warning communication criteria should be sustained to avoid any confusion or complicated situations because current criteria have no fatal errors when sending warnings regarding targeted disasters from engineering and



social points of views. However, the criteria of the warning communication shall be reviewed annually by the PMD and the revision of warning criteria shall be concurred with by NDMA/F/G/S/PDMAs when revisions are required based on the propriety evaluation and verification to be conducted by the PMD.

### 5) Policy on Outline of System Formulation

Observed data related to the forecast approach can be transmitted by appropriate communication systems in terms of reliability, economic efficiency and maintenance aspects. The General Packet Radio Service (GPRS) with the Internet, SMS, Meteor Burst Communication, H.F. radio wave and satellite V-Sat shall be adopted for the data transmission from meteorological observation equipment.

The Plan proposes not only mere improvement with its extension of capacity, but also shifting of warning contents from qualitative to quantitative forecasts.

### 6) Cooperation and Coordination in Other Related Activities

The Multi-Hazard EWS would not be appropriately operated alone and its effectiveness would be reduced if the acceptance and orientation of the EWS are not recognized by target communities. The suitable operation of the EWS could be achieved in collaboration with other related activities on a routine basis.

In addition to innovation and enhancement of the Multi-Hazard EWS based on a review of the current EWS, it is essential to undertake the following activities for more efficient operation of the system:

- Preparation of Hazard Maps
- Enhancement of DRM Education and Public
- Awareness (Enlightenment) regarding EWS
- Capacity Development of the Staff of Early Warning Agency(ies)

### 3. Programs and Projects Proposed in the Plan

The proposed programs and projects to be implemented under the plan are given in Table 21 below.

**Table 21 List of the Projects and Programs**

<b>Priority-1 (Short to Medium Term Projects/Studies)</b>		<b>Related Strategy No.</b>
1-1	Establishment of Specialized Medium Range Forecasting Centre, including Appurtenant Facilities	1, 3
1-2	Establishment of (Additional) Upper –Air Observation Systems	1
1-3	Replacement of Existing Radar Stations Phase -1 -Islamabad - Karachi (based on comparative analysis/ study)	1
1-4	Strengthening of Flood Forecasting by Satellite Info. and Hazard Maps of Indus River	1
1-5	Establishment of Communication System Between PMD and NDMA	3
1-6	Development of the EWS National Plan, Guidelines and SOPs for HEPR	3
1-7	Establishment of New Meteorological Radar Stations Phase-1 (for Charta)	1
<b>Priority-2 (Long Term Projects/Studies with F/S)</b>		<b>Related Strategy No.</b>
2-1	Tsunami Simulation and Hazard Maps	2
2-2	Expansion of AWS Network including Communication System	1
2-3	Establishment of New Meteorological Radar Stations Phase -II (Pasni/Gwadar – Balochistan), (Badin/Thatta only if replacement of Karachi radar is not found feasible under Priority-1 based on comparative analysis/study) with finalization of SOPs	1, 3
2-4	Establishment of Regional Flood Forecasting Warning Centres	1
2-5	Expansion of Rainfall and Water Level Observation Network	1
2-6	Establishment of Local Flash Flood Forecast and Warning System (LFFFC) w/ Hazard Map Phase-I	1, 2
2-7	EW S for GLO F and Snowmelt Flash Flood w/ Hazard Maps	1, 2
2-8	Research Activities for Snow/Glacier/Glacial Lakes	1, 4
2-9	Preparation of Landslide Hazard Maps	
2-10	Establishment of Communication System among DMAs (NDMA, F/G/S/PDMAs, DDMA)	1, 2 3
2-11	Establishment of Weather Forecast Guidance System	1, 4
<b>Priority-3 (Super Long Term Projects/Studies with F/S)</b>		<b>Related Strategy No.</b>
3-1	Establishment of New Meteorological Radar Stations Phase-III (for Chitral and Quetta)	1
3-2	Additional Installation of AWS for the Observation of Basic Meteorological Data	1
3-3	Establishment of Local Flash Flood Forecast and Warning System (LFFFC) w/ Hazard Map Phase-II	1, 2
<b>Priority-4 (Super Long Term Projects/Studies with F/S)</b>		<b>Related Strategy No.</b>
4-1	Replacement of Existing Radar Stations Phase-II (D. I. Khan and Rahim Yar Khan Radars)	1
4-2	Establishment of New Meteorological Radar Stations Phase-IV (for D. G. Khan and Sukkar)	1
<b>Priority-5 (Super Long Term Projects/Studies with F/S)</b>		<b>Related Strategy No.</b>
5-1	Establishment of Tide Monitoring Network	1
5-2	Establishment of Seismic Intensity Reporting System	1
5-3	Establishment of Landslide EWS	1
5-4	Establishment of Avalanche EWS	1
<b>Recurring Activities</b>		<b>Related Strategy No.</b>
R-1	Education Program for Meteor-Hydrology for PMD Staffs	4
R-2	Enhancement of Community Enlightenment regarding EWS with training and drills	4

#### 4. Implementation Cost

The priority-wise estimated cost for implementation of projects is given in Table 22 whereas Table 23 shows the cost of MHEWS (Vol.-II).

**Table 22 Estimated Cost of Projects/Programs**

Priority Projects	Estimated Cost (million PKR)
Priority-1	3,226
Priority-2	5,535
Priority-3, 4 and 5	7,330
Recurring Activities	570
<b>Total</b>	<b>16,661</b>

(US\$ 188.5) 1USD=88.4PKR

**Table 23 Priority Actions/Programs/Cost of MHEWS for the Next Ten Years (2012-2022)**

Strategy	app. Cost (million USD)	Time Frame									
		Phase 1				Phase 2			Phase 3		
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>4.4 Intervention-4: Establish multi-hazard early warning and evacuation systems</b>											
1.Strengthen forecasting and early warning systems	168.5										
2.Prepare hazard maps at local scale in targeted locations	5.7										
3.Strengthen early warning dissemination systems	3.1										
4.Develop capacity of early warning and evacuation systems	11.2										
<b>Total Cost (million USD)</b>	<b>188.50</b>										
<b>Total Cost (billion PKR)</b>	<b>16.66</b>										

1USD=88.4PKR

## Instructors' Guidelines on Community Based Disaster Risk Management (Volume III)

The CBDRM Guidelines consist of three parts. Part-I is the introduction, Part-II is the proposed methodology and Part-III consists of CBDRM activities, findings and lessons learnt.

### PART I INTRODUCTION

#### 1. Necessity of CBDRM

The Great Hanshin Awaji Earthquake of 1995 was the first milestone, proving the effectiveness of community participation. Statistics show that 72% of the people were either self-evacuated or were rescued from the debris by their neighbors. This indicates the importance of community, and a community-based disaster management committee immediately after a disaster. The greater the devastation and vastness of the disaster impacts, the less the chances are of public assistance. Secondly, the community participation and involvement has become a universal process. Under such circumstances, the necessity for Community Based Disaster Risk Management (CBDRM) is being stressed and recognized widely. In the JICA project, the CBDRM approach has been applied in view of its universal reorganization and importance.

#### 2. Objectives of CBDRM

The objectives of the Community Based Disaster Risk Management (CBDRM) activities are:

- 1) To establish a system for reflecting lessons learned from the CBDRM activities to the disaster risk management plans; and
- 2) To create best practices to be used as models for other CBDRM activities.

### PART II Methodology

#### 1. Unit of Community

In JICA Activities regarding CBDRM, the community is defined as a unit in which constituents can feel the sense of unity. The members of the community are community leaders, school principals, teachers, Imam of the

mosque, leader of CBOs and residents of the community.

#### 2. CBDRM Model

The community activities have taken the following three major steps.

##### 1) Recognizing Disaster Risk

The first step is to recognize and have a clear image of the past and possible future disasters in the community and understand the external forces that create disasters. For this, visual materials are shown. Town watching and hazard mapping exercises can help understand hazards and risks in the community. The Disaster Imagination Game helps visualize the disasters and disaster situation clearly.

##### 2) Examining Countermeasures

While imagining disaster situations, countermeasures are discussed and examined and a Community Based Disaster Risk Management Plan is prepared. Formulation of Community Based Disaster Risk Management Committees is planned and their roles and responsibilities are decided. Plans for training and drills are developed.

##### 3) Actions

Disaster Risk Management Plans are implemented. A Disaster Risk Management Committee is established. Preparedness and mitigation activities are implemented. Awareness raising activities and drills are conducted. By conducting activities and drills, necessary improvements are identified. Then Disaster Risk Management Plans are revised accordingly. Figure 3 shows the CBDRM Model.

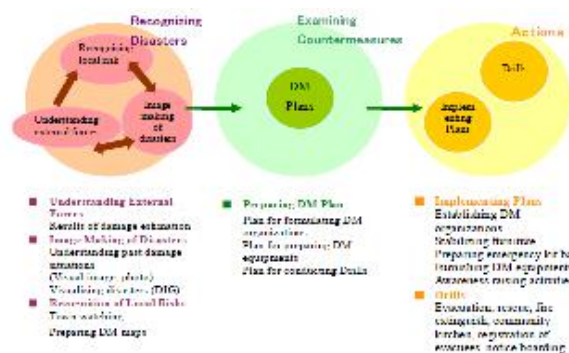


Figure 3 CBDRM Model

### 3. Planning Methodology

The process of developing CBDRM plans is shown in Figure 4. Pilot activities were conducted at five pilot community sites for five different disasters, namely, flood/flash floods, earthquakes, tsunamis, droughts, and cyclones. In these pilot communities, a series of activities were conducted; including vulnerability and capacity assessment, awareness raising activities, knowledge development, community based DRM plans, practical training, and drills. Community based DRM plans were prepared to link with local development plans. After the CBDRM activities, model plans for five disasters were prepared and good practices and lessons learnt were compiled. Finally, by including these experiences, a CBDRM plan in the National DRM plan was prepared.

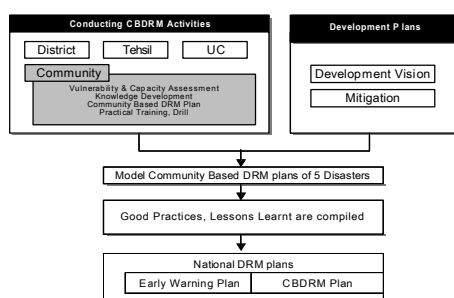


Figure 4 Planning Methodology

## PART III CBDRM Activities and Lessons Learnt

### 1. Selected Communities

One community is selected for one target disaster. For some communities like in Rawalpindi, due to requests and necessity, a few more disasters were added. Five selected communities and their target disasters are summarized in Table 24.

Table 24 Five Selected Communities

#	Province	District	Tehsil Township	Union Council	Community	Population	Target Disasters
1	Punjab	Rawalpindi	Rawalpindi	UC 45	Javed Colony	15,000	Flash Flood (Earthquake) (Fire)
2		Bhakkar	Mankera	Hyderabad 42	Dar Boola	5,000	Drought
3							
4	Sindh	Karachi City Urban Area	Saddar Town	Punjabi Club UC 3	Kharadar	616,151 (Saddar Town)	Earthquake (Tsunami)
5		Thatta	Keti Bandar	Keti Bandar	Keti Bandar	22,000	Cyclone (High Tide) (Tsunami)

### 2. Baseline Survey

The activities start by conducting a Baseline Survey, which is the assessment of vulnerabilities and capacities of individuals and communities, followed by town watching, hazard and risk mapping, preparation of CBDRM plans, and drills. As common activities for five pilot sites, a Study, Visit and Forum were separately conducted. Details are given in Table 25.

Table 25 CBDRM Activities

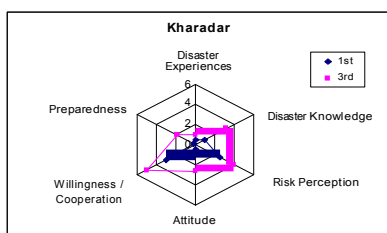
Category	Activities
Selection	Preliminary Visit
	Discussion with the Concerned
Baseline	Baseline Survey
Preparation	Strategic Meeting
	Preparation of CBDRM Guidelines for Instructors
	Preparation of CBDRM Materials
	TOT
CBDRM Activities	Stakeholders' meetings
	Disaster Awareness Raising Activities
	Town Watching
	Hazard Mapping
	CBDRM Plan
	Installing DRR Equipment
	Disaster Scenario, Drill
End	End Survey
Common Activities	Minutes of Agreement

### 3. Preparing Instructors' Guidelines

Afterwards, ToT and the actual training sessions were conducted along with these guidelines. These guidelines have been improved incorporating field experiences and are expected to be utilized as a tool for conducting CBDRM activities in other areas of Pakistan. The characteristics of the guidelines include scientific knowledge of different disasters, past damage situations in Pakistan, and structural and non-structural countermeasures for each different disaster and highlighting CBDRM planning by introducing the Disaster Imagination Game, known as DIG as a planning tool.

### 4. Baseline and Post Completion Survey

In these CBDRM activities, baseline and post completion surveys were conducted to measure the effect of the activities. One of the examples is shown in Figure 5.



**Figure 5 Baseline and Post Completion Survey Results**

Characteristics of the findings are summarized below.

### 1) Increase in Risk Perception, Knowledge and Preparedness

After implementing CBDRM training, awareness about risk perception, preparedness and knowledge was observed. The greatest impact was found in Karachi compared to the other communities. The reason being that earlier, the risks of earthquakes were not widely disseminated to community people in Karachi.

### 2) Increase of Risk Perception in Urban Scenarios

Compared to the rural Areas of Bhakkar, Muzaffargarh, and Thatta, the Risk Perception was initially quite low in the urban areas of Rawalpindi and Karachi. Now, an increase in risk perception can be observed more in the urban settings after conducting CBDRM activities.

### 3) Similarity among the target communities

There are similar tendencies in the radar charts. The risk perception and the willingness are higher than the disaster knowledge and preparedness.

## 5. Lessons Learnt

Key findings are listed below.

### 1) Participation

- Encouraging participation in the rural areas is not a problem, while in urban areas, it is extremely difficult.
- There should be various efforts from not only the public, but also private entities to encourage the participation in urban areas. Exhibitions, seminars, workshops, symposiums and poster presentations on

DRM can be organized as an attraction to increase participation in urban areas.

- Females participated very actively and took leadership of the Community Disaster Management Committee (CDMC).

### 2) Delivery of Activities

- Practical activities increase and retain the interest and attention of the participants.
- There was little scientific knowledge on disasters. Considering the low literacy rate, visual materials, visual demonstrations of experiments, town watching and mapping exercises can be used to draw the attention and interest of the participants.
- Both males and females in equal numbers participated in the drills on the last day and tested putting the knowledge gained into practice.

### 3) Mapping Exercise

- Risk and resource mapping increased the enthusiasm of participants and a large number of participants were involved.

### 4) Continuation of the DRM Activities

- Some intervention by public officials is necessary to ensure sustainability of DRM activities at the community level. To realize this, a budget for travel and technical support needs to be secured.

### 5) Intervention of Public Officials

- Discussions among public officials were effective and also gave local government officials a clear image of ground realities.
- The community and the Community Disaster Management Committee (CDMC) wish to have a permanent link with the implementing organizations, so a comprehensive community DRM plan for follow up would help retain the cohesion in the newly formed Committee and the level of collaboration between the government and local stakeholders. A budget for such activities needs to be secured at the district level.

**6) Establishing a Mechanism for Incorporating Local Needs into Planning**

- DRM plans were effectively discussed among the community and local government officials for implementation. However, establishment of a mechanism for incorporating village DRM needs into local government development plans will require more time and effort.

**7) Implementing Mitigation Measures**

Participants at the drought site in Bhakkar were keen to learn about drought and its impacts and asked a lot of questions to the drought impact assessment expert. They were also interested in changing crop patterns and methods of cultivation.

Priority Actions/Programs under CBDRM (Vol.-III) including cost are shown in Table 26.

**Table 26 Priority Actions/Programs/Cost of CBDRM for the Next Ten Years (2012-2022)**

Strategy	app. Cost (million USD)	Time Frame									
		Phase 1				Phase 2			Phase 3		
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>4.6 Intervention-6: Strengthen awareness program on disaster risk reduction at local level</b>											
1. Enhance knowledge on disasters management in the general public	1.0										
2. Establish safe evacuation places in the case of disaster situation	10.0										
3. Implement and disseminate CBDRM activities	1.0										
4. Disseminate self help and mutual help efforts in disaster management	1.0										
5. Establish disaster mitigation measures incorporated with existing development program	1.0										
<b>Total Cost (million USD)</b>	<b>14.00</b>										
<b>Total Cost (billion PKR)</b>	<b>1.24</b>										

1USD=88.4PKR