

NATIONAL DISASTER MANAGEMENT PLAN

Main Volume



August-2012



GOVERNMENT OF PAKISTAN
MINISTRY OF CLIMATE CHANGE
NATIONAL DISASTER MANAGEMENT AUTHORITY



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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 Disaster Management System (DRM) in Pakistan. The rapid change in global climate has given rise to many disasters that pose severe threat to the 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 to 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 in addition to an 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:

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|---|-----------|
| • 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 |

EXECUTIVE SUMMARY

I. National Disaster Management Plan (NDMP)

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. National Disaster Management Authority (NDMA) was created in 2007 as the executive arm of the NDMC which 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 (flood, earthquake, tsunami, drought, sediment disaster, avalanches, GLOF, cyclone with storm surge, 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, GLOF, 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, 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 followings:

- 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 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, 2005 Earthquake, country-wide 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 Intervention 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 (41) strategies and one hundred eighteen (118) proposed priority actions/programs. These interventions 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 above interventions, over the next ten years (2012-2022) under the overall NDMP (Vol-1 to Vol-IV), have been identified as shown in Table 1. (a). The interventions are guidelines covering all actions raised in the Hyogo Framework for Action as illustrated in Table 2. Intervention-wise strategies and proposed priority actions/programs to be undertaken by the responsible organizations are given in Table 3 to Table 12.

Table 1.(a) Priority Actions/Programmes/Cost of NDMP 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
4.1 Intervention-1: Establish the Institutional and Legal System for Disaster Management											
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.	-										
4.2 Intervention-2: Prepare Disaster Management Plans at Various Levels											
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										
4.3 Intervention-3: Establish national hazard and vulnerability assessment											
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										
4.4 Intervention-4: Establish multi-hazard early warning and evacuation systems											
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										
4.5 Intervention-5: Promotion of training, education and awareness in relation to disaster management											
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										
4.6 Intervention-6: Strengthen awareness program on disaster risk reduction at local level											
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										
4.7 Intervention-7: Infrastructure development for disaster risk reduction											
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										
4.8 Intervention-8: Mainstreaming disaster risk reduction into development											
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	-										
4.9 Intervention-9: Establish national emergency response system											
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.	-										
4.10 Intervention-10: Capacity Development for Post Disaster Recovery											
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										
Total Cost (million USD)	1,040.90										
Total Cost (billion PKR)	92.02										

1USD = 88.4KR

Table 1(b) Priority Actions/Programs/Costs 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
4.1 Intervention-1: Establish the Institutional and Legal System for Disaster Management											
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.	-										
4.2 Intervention-2: Prepare Disaster Management Plans at Various Levels											
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										
4.3 Intervention-3: Establish national hazard and vulnerability assessment											
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										
4.7 Intervention-7: Infrastructure development for disaster risk reduction											
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										
4.8 Intervention-8: Mainstreaming disaster risk reduction into development											
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	-										
4.9 Intervention-9: Establish national emergency response system											
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.	-										
4.10 Intervention-10: Capacity Development for Post Disaster Recovery											
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										
Total Cost (million USD)	774.10										
Total Cost (billion PKR)	68.43										

Table 2 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 3 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 4 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, DDMA
	1.2. Develop district DMPs in remaining districts	F/G/S/PDMAs, DDMA
	1.3. Develop community-based DMPs at TMA level	F/G/S/PDMAs, DDMA
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 5 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 6 Intervention-4: Establish a multi-hazard early warning system

Strategies	Priority Actions /Programs	Responsible Organizations
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/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/PDMAs/DDMA/R related Agencies
3. Strengthen early warning dissemination system	3.1. Innovation of the communication system between PMD and NDMA, and among DMAs (NDMA-PDMA-DDMA) and a communication system utilizing cellular phone and radio broadcast networks	NDMA/F/G/S/PDMAs/D DMAs/PMD/PID/NGOs/PTA/PEMRA/Local Governments
	3.2. Development of the EWS National Plan, Guidelines and SOPs for Health Emergency Preparedness and Response (HEPR)	NDMA/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/PDMAs/DDMAs/PMD/FFC/NGOs
	4.4. Education Program for advanced meteorology and hydrology for PMD staff	PMD

Table 7 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 8 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 ¹ 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

¹ 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 9 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"> • A review of breaching mechanism of the river embankments (flood bunds) and a review of designated breaching points • Revision and updating of NFPP-IV • Revision of SOPs of Tarbela Dam for flood mitigation • Flood plain zoning and management • Capacity building of the stakeholders in flood mitigation 	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"> • Implementation of NFPP-IV • Construction of DRM centres in flood prone areas • Retrofitting of existing dams, barrages and flood protection works to increase floodwater retarding capacity and ability to accommodate design discharges • Constructing of new flood protection works, dams and barrages to increase flood mitigation/protection capacity 	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 10 Intervention-8: Mainstreaming disaster risk reduction into development

Strategies	Priority Actions / Programs	Responsible Organizations
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 11 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 logistic 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 12 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, DDMAs
	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

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank		Ordinance
AJ & K	Azad Jammu and Kashmir	NDMP	National Disaster Management Plan
BCP	Business Contingency Plan	NDRMF	National Disaster Risk Management Framework
CBDRM	Community-based Disaster Risk Management	NDRP	National Disaster Response Plan
CBOs	Community-based Organizations	NEOC	National Emergency Operations Centre
CDA	Capital Development Authority	NFPP	National Flood Protection Plan
C&W	Communication & Works	NGOs	Non-governmental Organizations
DCO	District Coordination Officer	NHA	National Highway Authority
DDMA	District Disaster Management Authority	NIDM	National Institute of Disaster Management
DDMP	District Disaster Management Plan	NWFP	North West Frontier Province
DDMU	District Disaster Management Unit*	PBC	Pakistan Broadcasting Corporation
DEOC	District Emergency Operation Centre	PCRWR	Pakistan Council of Research in Water Resources
DEWS	Disease Early Warning System		
DG	Direction General	PDMA	Provincial Disaster Management Authority
DM	Disaster Management	PDMC	Provincial Disaster Management Commission
DMA	Disaster Management Authority	PEOC	Provincial Emergency Operation Centre
DNA	Damage and Needs Assessment	PEPAC	Pakistan Environmental Planning and Architectural Consultants Limited
DRM	Disaster Risk Management		
DRMP	Disaster Risk Management Program	PID	Provincial Irrigation Department
DRR	Disaster Risk Reduction	PM	Prime Minister
DTC	Diarrhea Treatment Centre	PMD	Pakistan Meteorological Department
EOC	Emergency Operations Centre	PRCS	Pakistan Red Crescent Society
ERRA	Earthquake Reconstruction and Rehabilitation Authority	PTV	Pakistan Television Corporation
		SMEs	Small and Medium-sized Enterprises
EWS	Early Warning System	SoP	Survey of Pakistan
FATA	Federal Administrated Tribal Areas	SOPs	Standard Operating Procedures
FF	Flood Forecasting	SPU	Strategic Planning Unit
FFC	Federal Flood Commission	SUPARCO	Space and Upper Atmospheric Research Corporation
FRC	Federal Relief Commissioner		
F/G/S/P	FATA/GB/State/Provincial	TCMC	Tropical Cyclone Monitoring Centre
GB	Gilgit Balochistan	TFCC	Task Force on Climate Change
GIS	Geological Information System	TMA	Tehsil (Town) Municipal Administration
GLOF	Glacial Lake Outburst Flood	UC	Union Council
GMDSS	Global Maritime Distress Safety System	UN	United Nations
GSP	Geological Survey of Pakistan	UNDP	United Nations Development Program
HFA	Hyogo Framework for Action	USAR	Urban Search and Rescue
HLV	Hazard, Livelihood and Vulnerability	WB	World Bank
HRDP	Human Resource Development Plan	WAPDA	Water and Power Development Authority
INGO	International Non-Governmental Organization	WASA	Water and Sanitation Agency
		WASH	Water, Sanitation and Hygiene
IPC	Inter-Provincial Coordination	WCDR	World Conference on Disaster Reduction
IPCC	Intergovernmental Panel on Climate Change	WFP	World Food Program
IT	Information Technology		
JCSC	Joint Chiefs of Staff Committee		
JICA	Japan International Cooperation Agency		
KP	Khyber Pakhtunkhwa		
MHEWS	Multi Hazard Early Warning System		
MMI	Modified Mercalli Intensity		
NDMA	National Disaster Management Authority		
NDMC	National Disaster Management Commission		
NDMO	National Disaster Management		

*In case of KP, 'DDMA' may be read as 'DDMU'
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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, microorganisms, 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 can 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). This 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 mudflows.

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 be 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.

Indus River System (IRS)

Refers to "River System" by major rivers, namely; Indus, Jhelum, Chenab, Ravi and Sutlej including other major tributaries such as Swat and Kabul Rivers.

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.

Meteorological disaster

Disasters resulting from meteorological phenomena, such as floods, cyclones, droughts, glacial lake outbursts, landslides due to heavy rain and avalanches.

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.

El Nino and La Nina

Comparing with the normal condition of sea surface temperatures in the equatorial Pacific Ocean, **El Niño** is characterized by unusually warm temperatures and **La Niña** by unusually cool temperatures. They have a strong impact on the continents around the tropical Pacific, and some climatic influence on half of the planet.

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 in order 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 chance of losses (deaths, injuries, property, livelihoods, economic activity disruption or environmental damage) 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 when referring 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, damage or benefits.

Chapter.1 Introduction

This section presents an overall structure of the Plan. It includes the background, vision, mission, objectives and timeframe of the National Disaster Management Plan. Disaster management consists of all the comprehensive efforts to reduce disaster risk by taking various measures of preparedness, mitigation, response, rehabilitation and reconstruction.

1.1 National Disaster Management System

The government promulgated the National Disaster Management Ordinance² in 2007 (hereinafter referred to as “the Ordinance”) in order to establish a national disaster management system in Pakistan. The Ordinance became the National Disaster Management Act in December 2010. The Ordinance 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, and has the responsibility for laying down policies and guidelines for disaster management and for approving the National Disaster Management Plan (NDMP). The Prime Minister is the chairperson of the NDMC. Under the NDMC, the National Disaster Management Authority (NDMA) was established, and serves as the implementing, coordinating and monitoring body for disaster management at the national level. One of the functions of the NDMA is to prepare a National Disaster Management Plan.

Along with the Ordinance, the National Disaster Risk Management Framework (NDRMF) was prepared by the NDMA in March 2007. The NDRMF serves as an overall guideline for disaster risk management at national, provincial and district levels.

The NDRMF identifies nine (9) priority areas for disaster risk management, including policy, institutions and capacity building with the time frame of 5 years (2007-2012). The priority areas identified by the NDRMF are:

- Institutional and Legal Arrangements
- National Hazard and Vulnerability Assessment
- Training, Education and Awareness
- Promoting Disaster Risk Management Planning
- Community and Local Level Risk Reduction Programming
- Multi-hazard Early Warning System
- Moving Mainstream Disaster Risk Reduction into Development
- Emergency Response System
- Capacity Development for Post-Disaster Recovery.

² The Ordinance became the National Disaster Management Act in December 2010, after approval in Parliament.

Recently, in March 2010, the NDMA formulated the National Disaster Response Plan (NDRP), which presents a framework of disaster management activities including Standard Operation Procedures (SOPs) of emergency response identifying all levels of stakeholders.

This National Disaster Management Plan, prepared based on the National Disaster Management Act 2010, aims at enhancing the capacity of the country to respond to disasters by defining the basics of measures considered necessary for disaster management in Pakistan while identifying the roles of the federal, provincial and district governments, community Organizations, businesses and residents. Disaster management is one of the most important administrative measures to protect the land and people's lives, welfare and property from disasters.

1.2 Vision, Mission and Objectives

The NDMA realized the importance of formulating the National Disaster Management Plan. It is a long-term, holistic policy document for Disaster Risk Management (DRM) at the national level. It contains all the aspects of disaster management policy, strategies and actions, including (i) national hazard and vulnerability assessment, (ii) human resource development, (iii) community-based disaster risk management, (iv) multi-hazard early warning system, (v) disaster management operation by type of disaster, such as earthquake, tsunami, flood, drought, cyclone, etc., and (vi) actions/programs for disaster management. The National Disaster Management Plan will determine the overall strategies for disaster management in Pakistan.

1.2.1 Vision

To achieve sustainable social, economic and environmental development in Pakistan through reducing disaster risks and vulnerabilities for all groups of people in the country; and to enhance the country's ability to manage natural disasters using a comprehensive national approach.

1.2.2 Mission

To manage the complete spectrum of disasters by development of disaster risk reduction policies, strategies, measures and actions of governments, especially at the national level, the community and individuals through enhancing institutional capacities, and human and material resources for mitigation, prevention and preparedness, response and recovery.

1.2.3 Objectives

Damage and losses from disasters have physical, economic, and social impacts. Mitigating and alleviating the damage and losses are required to collectively increase resiliencies in physical, economic and social areas, using technologies, knowledge, information, and human resources. Preparations need to cover all stages including pre-disaster, emergency response, and post-disaster periods.

The National Disaster Management Plan was developed as a part of an institutionalization process. It aims: i) to develop resilience in society against disasters of the type that Pakistan has experienced such as the 2005 Earthquake and Pakistan Flood 2010, ii) to mitigate damage from recurring disasters such as earthquakes, tsunamis, floods/sediment disasters, and other natural disasters, iii) to take care of vulnerable peoples such as women, marginalized people, elderly people, disabled people, etc., and iv) to clarify the roles of the national and local governments, public agencies, corporations and residents for each type of disaster.

1.2.4 Scope

The concepts applied to major disasters in the National Disaster Management Plan are for natural hazards or any other occasion for which NDMC determines that assistance of the National Government is needed to supplement provincial and district level efforts and capabilities.

1.2.5 Time Frame

The time frame of the Plan is considered to be ten years from 2012 to 2022. Monitoring of the Plan will be conducted by the NDMA with the participation of relevant stakeholders.

1.3 Hyogo Framework for Action

The importance of promoting disaster risk reduction efforts on international, national and local levels has been recognized in the UN-World Conference on Disaster Reduction (WCDR). The vision, mission and objective of the National Plan will be developed in harmony with the Hyogo Framework for Action (HFA) 2005-2015, which was agreed by all nations in January 2005 during the WCDR. The HFA envisages the following five priorities for action 2005-2015:

- Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.
- Identify, assess and monitor disaster risks and enhance early warning.
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
- Reduce the underlying risk factors.
- Strengthen disaster preparedness for effective response at all levels.

The National Disaster Management Plan in Pakistan follows these priority areas for action as an overall framework for national disaster management.

1.4 Disaster Risk Management Approach

According to the National Disaster Management Act 2010, the following measures would be included in the National Plan:

- Measures to be taken for the prevention of disasters and/or the mitigation of their effects.

- Measures 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 to measures specified in the clauses above.

For efficient execution of the National Plan, it is important to allocate measures and actions in each stage of the disaster management cycle. The Plan has been organized in three stages as illustrated in Figure 1.1: (i) pre-disaster including mitigation and preparedness measures, (ii) during disaster including emergency response and relief measures, and (iii) after-disaster including rehabilitation and reconstruction measures.



Figure 1.1 Disaster Management Cycle

1.5 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.

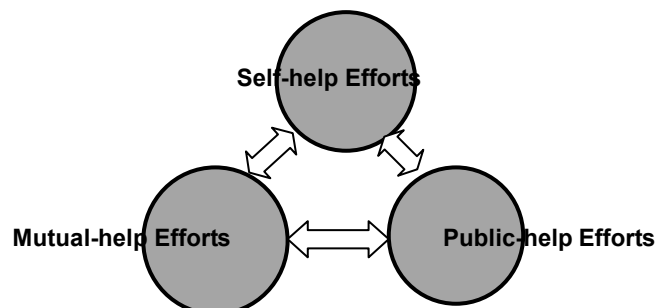


Figure 1.2 Disaster Reduction Measures

1.6 The Plan Structure

The National Disaster Management Plan (NDMP) consists of eight (8) chapters and four (4) appendixes. Following the introduction of Chapter 1, Chapter 2 discusses Pakistan's vulnerability to natural and man-induced hazards and the methodology of hazard risk assessment. Chapter 3 presents existing institutional systems and the roles and responsibilities of key stakeholders in disaster management. Chapter 4 proposes disaster management intervention, strategies and priority actions/programs to be implemented over the next ten (10) years. The subsequent four chapters from Chapter 5 to Chapter 8 present disaster management measures: geological hazards in Chapter 5; meteorological hazards in Chapter 6; industrial hazards in Chapter 7 (reference); and biological hazards in Chapter 8 (reference). There are four (4) appendixes. Appendix-I shows hazard and risk maps, including floods, earthquakes, tsunamis, sediments, cyclones, droughts, glacial lake outburst floods (GLOF), and avalanches. Appendix-II shows roles and responsibilities of stakeholders in disaster management. Appendix-III shows the formulation process of NDMP, including lists regarding steering committee meetings, technical committee meetings and participants in consultative workshops. Appendix IV shows the project-team members.

1.7 Monitoring of the Plan

It will be the responsibility of the NDMA to update and monitor the Plan annually by using indicators³. If any situation arises demanding a change in the Plan, i.e., after a major disaster, NDMA will be responsible for upgrading and/or revising the Plan with the participation of relevant stakeholders. Revision of the Plan needs to be approved by NDMC. Besides for micro level monitoring and evaluation the individual projects shall have to have their individual inbuilt M&E mechanism.

³ HFA key performance indicators are provided on http://www.preventionweb.net/files/2259_IndicatorsofProgressHFAannexes.pdf

Chapter.2 Hazards, Vulnerability and Risk Assessment

2.1 Hazard Analysis

2.1.1 Definition and Overview of Hazards

According to the definition of NDMA, hazards are potentially damaging physical events or phenomena 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) or be 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.

Pakistan's natural hazards include earthquakes, tsunamis, floods, sediments (landslides), cyclones, droughts, global lake outburst floods (GLOFs), and avalanches. Human-induced hazards that also threaten Pakistan's society, economy and environment include industrial disasters, transportation accidents, urban and forest fires, civil conflicts and epidemic breakout. Locusts, grasshoppers of the family Acrididae, often migrate in immense swarms that gulp down vegetation and crops. Locusts can travel great distances and the pests devour virtually everything in their path including crops, fruits and even trees. Generally, their invasion is one of the most dreaded phenomena for the agriculture sector. Locusts normally breed in desert areas and widespread heavy rainfall further makes the ecological conditions congenial for the flare-up of locust population. This invasion normally takes place in the months of June – July. Even if this invasion happens only once, it can create famine. Sindh province, having large desert areas and being attached to the Indian deserts, is more vulnerable to this threat. The recent historical rains, which are forecasted to have high intensity for many years in the future, make this a notable hazard. In Sindh province this hazard may cause a countrywide disaster, as Sindh is the major producer of crops. Normally, the plant protection department, which is equipped with planes, takes care of this issue and reacts depending upon the information provided by international agencies like FAO. Priority hazards in terms of impact on society, the economy and the environment in Pakistan are earthquakes, tsunamis, floods, sediments, cyclones, droughts, GLOFs and avalanches that cause huge damage and losses in the country.

The overview of the hazards in Pakistan is summarized as below:

Pakistan is one of the countries most vulnerable to natural disasters in the world since it has more variety in terms of topography and meteorology by region. The earthquake of 8 October 2005 highlighted Pakistan's vulnerability to disaster risks. This has been further evidenced by the recent devastation from the Indus River Flood starting at the end of July 2010 and converging in the middle of September. Pakistan has been hampered by damage from a wide range of natural disasters in the past.

The profile of natural disasters in Pakistan from 1980 to 2008 is shown in Table 2.1 compiled from the international database. Among all types of natural disasters, Pakistan experienced floods most frequently with earthquakes causing the most loss of lives. Droughts have also affected widespread areas and a large number of people.

Table 2.1 Profile of Natural Disasters in Pakistan

Type	Event/ year	Deaths/ event	Affected/ event	Loss* / event
Droughts	0.03	143	2,200,000	247,000
Earthquakes	0.66	3,900	339,198	274,553
Epidemics	0.31	27	1,712	
Extreme temp	0.41	101	48	
Floods	1.72	136	565,236	33,908
Mass mov. dry	0.03	50		
Mass mov. wet	0.55	33	227	
Storms	0.59	85	128,641	95,937

* US\$ 1,000

Source: EM-DAT, 1980-2008

Natural disasters in Pakistan have been mainly caused by meteorological/weather phenomena, such as floods, storms, cyclones, landslides and extreme weather. Climate change and variability are major dynamic pressures that increase the vulnerabilities of Pakistani society to disasters. These natural disasters, compounded by artificial disasters, will increase damage to humans and societies. For example, perennial floods will cause the occurrence of epidemics, resulting in deterioration of the living environment.

The current status of disasters in Pakistan is summarized below.

Table 2.2 Current Status of Disasters in Pakistan

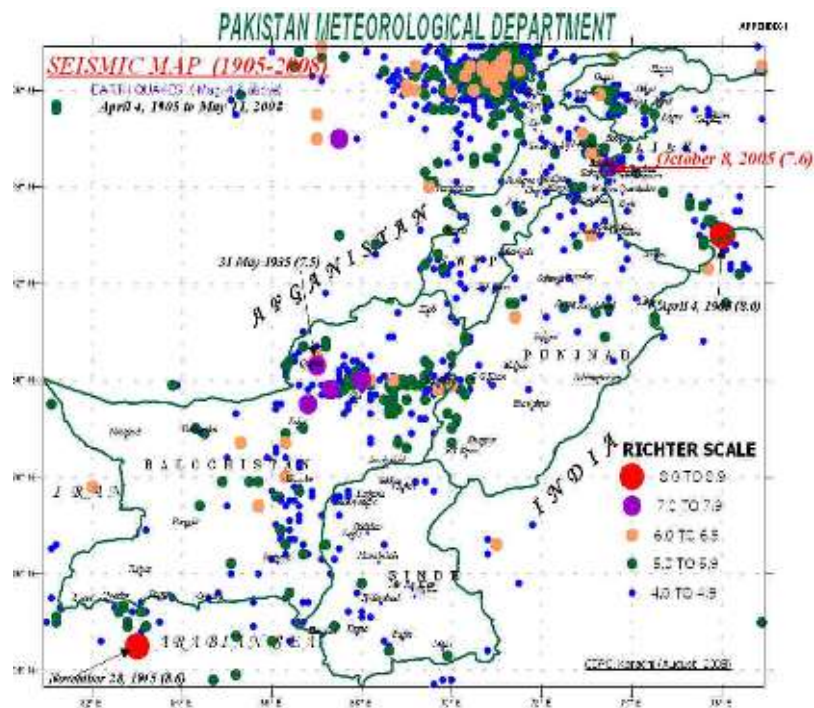
Type of Disaster	Current Status in Pakistan
Floods	<ul style="list-style-type: none"> • Occur normally due to tropical monsoon depression systems that originate from the Bay of Bengal during the monsoon season from July to September • "(Indus) River Flood" broadly inundating floodplains along major rivers (Indus, Jhelum, Chenab, Ravi, Sutlej and Kabul) • "Flash Floods" seriously damaging cities and farmlands along the foot of mountains and hills • "Coastal Floods" harming low-lying areas along coasts by cyclones, storm surges and local downpours
Cyclone with Storm Surge	<ul style="list-style-type: none"> • Cause "Coastal Floods" • Hit Pakistan once every 4~5 years • In particular, Sindh and Balochistan Provinces are vulnerable.
Earthquake and Tsunami	<ul style="list-style-type: none"> • Occur in small magnitudes with occasional large earthquakes because Pakistan lies in a seismic belt • Even if only a small-scale earthquake occurs, considerable damage is caused due to low quality and weak quake resilience of buildings
Drought	<ul style="list-style-type: none"> • The most serious drought occurred during 2000~2002 • Frequently occur in Sindh, Balochistan and the southern parts of Punjab because the mean annual rainfall volumes in these locations are less than 200-250 mm

Source: PMD and FFC and others, compiled by JICA Study Team

2.1.2 Earthquakes

Earthquakes have hit Pakistan periodically. Figure 2.1 shows the epicentres of earthquakes with a magnitude larger than 4, between 1905 and 2008, as compiled by PMD. It is notable that seismicity is especially high in the northern and western parts of the country.

Historical records show that earthquakes as small as magnitude 4 have caused some deaths in Pakistan. Earthquakes with magnitudes larger than 7, such as the 1935 Quetta earthquake and the 2005 Earthquake, caused significant damage including a number of human lives lost. This fact can be attributed to the vulnerability of the building structures to earthquakes.



Source: PMD

Figure 2.1 Seismic Map (1905-2008)

Vulnerability to earthquakes can be examined through seismic data of past earthquakes and data obtained from post-earthquake damage surveys in the field. Damage statistics illustrate the spatial distribution of seismic intensity and are used as basic information to examine vulnerability to earthquake disasters. In Pakistan, isoseismal maps have been prepared for the 1945 Makran Earthquake, the 2002 Nanga Parbat Haramosh Earthquake⁴, and the Pakistan Earthquake in 2005. A detailed damage survey of the Pakistan Earthquake in 2005 was conducted through support from ADB and World Bank. The damage statistics are shown in Table 2.3. This survey shows that

⁴ A. A. Khwaja, Monalisa, S. A. Khan, Q. Z. Chaudhry, M. Rafiq & A.T. Khan, 2003, Recent Seismic Activity Along the Western Margin of the Nanga Parbat Haramosh Massif, Pakistan, Islamabad J. Sci. Vol. 13 (1).

design and construction of buildings with seismic resistance are important to reduce the damage from earthquakes in the country.

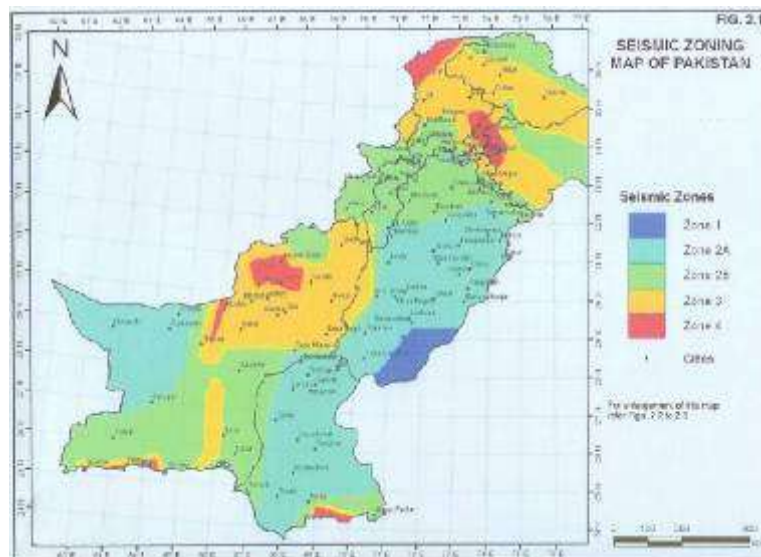
Table 2.3 Damage Statistics from the 2005 Earthquake

Province	District	a	b	c	d	e	f	MMI	Full damage ratio (%) =c/b	Death ratio (%) =e/a
		Population in 1998	Houses in 1998	Houses full damage	Houses partial damage	Deaths	Injuries			
KP	Abbottabad	880,666	153,819	6,961	27,051	515	1,730	8	4.5	0.1
	Batagram	307,278	44,585	28,712	8,656	3,232	3,279	10	64.4	1.1
	Kohistan	472,570	74,087	4,350	18,395	661	639		5.9	0.1
	Mansehra	1,152,839	203,109	31,323	43,282	24,511	30,585	10	15.4	2.1
	Shangla	434,563	67,003	15,661	10,281	423	957	5	23.4	0.1
AJK	Bagh	393,000	59,623	47,619	18,226	8,157	6,644	9	79.9	2.1
	Murpur	334,000		0	0	6	11	7		
	Muzaffarabad	746,000	123,679	108,157	17,120	33,724	21,374	10	87.4	4.5
	Neelum			3,692	7,215	447	1,013	9		
	Rawalakot (Poonch)			15,086	25,405	1,025	1,909	9		
	Sudhnoti	224,000		429	1,719	4	16	9		
Total				261,990	177,350	72,705	68,157			

MMI: Modified Mercalli Intensity

Source: ADB and WB, 2005, Census data, 1998.

In Pakistan, the national seismic zone map (Figure 2.2) was developed during the process of formulation of the building code in 2007 by the Ministry of Housing and Works. Seismic hazard maps on a local scale have been developed by ERRA, including seismic hazard microzonation maps for Balakot and Muzaffarabad affected in the 2005 Earthquake. NDMA also developed the seismic hazard assessment maps for Muzaffarabad and Mansehra. In Karachi, the Karachi Building Control Authority compiled information on seismic risk in Karachi and published a book on seismic zones⁵. It is expected that these hazard maps will be reflected in the local disaster management plan.



Source: Building Code of Pakistan

Figure 2.2 Seismic Zone Map of Pakistan

⁵ A. Razzak Loya, Nayyer Alam Zaigham, and Mushtaq H. Dawood, 2000, Seismic Zoning of Karachi and Recommendations for Seismic Design of Buildings

2.1.3 Tsunamis

Due to the tectonic setting in the Arabian Sea where the Arabian plate subducts beneath the Eurasian plate, large earthquakes along the Arabian coast have occurred historically. It should be noted that not all of the large earthquakes generated tsunamis. Besides earthquakes, tsunamis can be generated by volcanic activity. A historical study of tsunamis in the Arabian Sea indicates that there remain uncertainties about tsunamis that have affected Pakistan. Table 2.4 shows the run up data regarding historical tsunamis.

Table 2.4 Historical Tsunamis in the Arabian Sea

Date	Time	M	Run up (m)	Location
1883/08/27	02:59	(Volcano)	0.50	Karachi
1945/11/27	21:56:40	8.3	15.24	Pasni, Ormara
1945/11/27	21:56:40	8.3	1.37	Karachi

Source : National Geophysical Data Centre

Large earthquakes have historically occurred along the Makran subduction zone, though not all of them have generated a tsunami. As the Makran subduction zone is located 70 km from the Pakistan coast, it is reported that the 1945 Tsunami hit the coast in less than 20 minutes. Distant tsunamis have not affected Pakistan so far. The 2004 Indian Ocean Tsunami did not reach Pakistan, as Pakistan is located behind the Indian subcontinent where the tsunami originated.

A simulation of tsunami disaster was conducted by PMD to estimate an inundation map in Gwadar (Rafi et al., 2010⁶). The simulation assumes an earthquake with Mw 8.5 magnitude, located 120 km offshore. The result shows that the first tsunami wave arrives at Gwadar in 22 minutes, and the maximum run up at Gwadar is approximately 3.7 m. The maximum time of duration of the tsunami is approximately 2 hours and 30 minutes. It also estimates that maximum flow depth could be 5 m, and the maximum inundation distance could be up to 1.46 km in Gwadar. It is pointed out that high-resolution bathymetry data with topography is important for estimating tsunami disasters.

2.1.4 Floods

In Pakistan, flooding is the most devastating and damaging natural disaster and subsequently causes tremendous loss of human lives, infrastructure and natural resources. Floods normally occur in Pakistan due to tropical monsoon depression systems that originate from the Bay of Bengal during the months from July to September. The depressions pass over central India and Rajpantana, enter Pakistan and go towards the north into Kashmir.

The mountain ranges in the extreme north of Pakistan, such as in the regions of Gilgit-Baltistan (GB), Azad Jammu and Kashmir (AJ&K), Khyber Pakhtunkhwa (KP) and the Federally Administrated Tribal Areas (FATA), provide a perennial source of inflow into the rivers that finally

⁶ Zahid Rafi, Nasir Mahmood, 2010, Numerical modeling of Tsunami inundation for potential earthquake at Makran subduction zone – A case study for Gwadar coast area

join the Indus River and flow into the Arabian Sea. In particular, floods hit the plains of Punjab and Sindh while hill torrents tend to affect the hilly areas of KP as well as FATA, Balochistan, AJ&K and GB.

It has been recognized that the flood characteristics can be mainly classified into two categories. One is floods or riverine floods that mainly occur in major rivers such as the rivers Indus, Kabul, Jhelum, Chenab, Ravi, and Sutlej, and their major tributaries. The other is flash floods that occur generally in hill torrents from the hill ranges and small to medium scale catchment tributaries due to heavy rainfalls. For instance, in the disastrous case of the 23rd July 2001 flash flood in Lai Nullah (joining the Soan River), which has a catchment area of 235 km² in the Margalla Hills, due to a very severe cloud-burst producing rainfall of 622 mm in Islamabad and 150 mm in Rawalpindi in 10 hours of continuous downpour, the worst flash flood ever occurred resulting in 79 deaths in the twin cities.

Historical records of flood damage in Pakistan are shown in Table 2.5. There have been five major flood events – in 1950, 1973, 1976, 1992 and 2010 – which caused many deaths and huge losses to the national economy. Total damage to property by the destructive major floods in Pakistan has reached over Rs 400 billion since 1950.

Table 2.5 Historical Flood Damage in Pakistan

Year	Value of Property Damaged (In Million Rs)		Lives Lost (persons)	Villages Affected (number)	Rivers Mainly Affected
	Unadjusted	Adjusted			
2011		324,533	520	38,700	(Local Rainfall in Sindh/Balochistan)
2010		854,771	1,985	17,553	Kabul, Indus, Jhelum
2009		Not Reported	99	89	
2008		Not Reported	157	800	
2007		7,208.23	586	6,498	
2006		Not Reported	541	2,477	
2005		Not Reported	59	1,931	Indus
2004		15.00	85	47	
2003		5,175.00	484	4,376	
2001		450.00	219	50	Lai Nullah
1995		6,125.00	591	6,852	
1992		34,751.00	1,008	13,208	Indus, Jhelum, and Chenab
1988		6,879.00	508	1,000	Indus/Jhelum, & Chenab/Ravi/Sutlej
1978		4,478.00	393	9,199	
1976		5,880.00	425	18,390	Indus, Jhelum, Chenab and Ravi (Tarbela Dam completed in 1974)
1973		5,137.00	474	9,719	Indus, Jhelum, Chenab, Ravi and Sutlej (Chashma Reservoir completed in 1971) (Mangla Dam completed in 1967) (Warsak Dam completed in 1960)
1957		152.50	83	4,498	Chenab and Ravi
1956		155.50	160	11,609	Indus, Jhelum
1950		199.80	2,190	10,000	Chenab, Ravi and Sutlej
Total		1,565,125.00	10,563	156,926	

Source: Federal Flood Commission (FFC) for 1950 – 2010.
Preliminary DNA Floods 2010-2011, NDMA

In July 2010, unprecedented heavy monsoon rains began in the northern part of Pakistan and the floods affected the regions of GB and KP. In early August 2010, the heaviest flooding moved southward along the Indus River from severely-affected northern regions toward western Punjab and Sindh, as well as parts of Balochistan. This flood, named Pakistan Flood 2010, was the worst, affecting around 160,000 km² (1/5 of Pakistan's total land area) and over 14 million people. According to the NDMA, the flood caused 1,825 deaths, 157 missing and around 3,000 injured; over 1.9 million houses were damaged and over 6.3 million acres (2.57 million ha) of cropped areas were destroyed as of October 4, 2010. A total of 78 districts were inundated by the Pakistan Flood 2010, in which 28 districts were severely affected: 1 district in AJ&K, 10 districts in KP, 7 districts in Punjab, 2 districts in Balochistan, and 8 districts in Sindh⁷.

Table 2.6, shows the districts that have had damage historically from either riverine floods or flash floods or both.

⁷ NDMA, Details of Affected Districts, as of June 2011

Table 2.6 Vulnerable Districts to Riverine Flood/Flash Flood Hazards in Pakistan

Province	Type of Flood		
	River Flood/Flash Flood	River Flood	Flash Flood
Khyber Pakhtunkhwa & FATA	Kohistan, Shangla, Swat, Charsadda, Peshawar, Nowshera, and D.I. Khan (KP), North Waziristan, South Waziristan, Khyber, Kurram and Orakzai Agencies (FATA)		Mansehra, Buner, Swabi, Chitral, <i>Lower & Upper Dir</i> , Malakand Agency, Mardan, <i>Tank</i> , Lakki Marwat and Kurram Agency
AJK	<i>Neelum</i> , Muzaffarabad and Bagh		Poonch and Bhimber
Gilgit Baltistan	Diامر, Gilgit, Ghizer, Chilas (Hunza Nagar), Skardu and Ganche		Astore
Punjab	Rawalpindi, <i>Miawali</i> , <i>Dera Ghazi Khan</i> , <i>Rajanpur</i> , Khushab, Gujrat, Sialkot, Gujranwala, Narowal and Sheikhupura	Bakkar, Layyah, Muzaffargarh, R.Y. Khan, Jhang	
Balochistan	Bolan, Jhal Magsi, Kharan, Kech and Gwadar		Sibi, <i>Nasirabad</i> , <i>Jaffarabad</i> , Khuzdar, Lasbela, Chagai (Dalbadin town) and Nushki
Sindh	<i>Larkana</i> , <i>Kamber-Shahdadkot</i> , <i>Dadu</i> , Sanghar and Badin	<i>Kashmore</i> , <i>Shikarpur</i> , <i>Jacobabad</i> , Ghotki, Sukker, <i>Jamshoro</i> , Khairpur and T.M. Khan	<i>Thatta</i> and Karachi

Source: PMD and FFC and others, compiled by JICA Study Team

Note: Districts in italics were severely affected by the 2010 Flood.

2.1.5 Sediments

Pakistan is at considerable risk for sediment disasters. Sediment disasters are defined as the phenomena that cause direct or indirect damage to lives and property through a large-scale movement of soil and rock. Damage due to these disasters occurs in several forms: 1) the ground on which buildings and farmlands are situated are lost due to a landslide or erosion; 2) houses are ruined by the destructive force of soil and rock during their movement; 3) houses and farmlands are buried underground by a large-scale accumulation of discharged sediment; and 4) aggradations of a riverbed and burial of a reservoir caused by sediment discharge along a river system, which may give rise to flooding, disruption of water supply, and deterioration of the environment. At all the places around mountain areas in Pakistan, sediment disasters are likely to occur due to the particular organic phenomena and downspouts resulting in destabilization of the slope.

Sediment disasters occur after heavy rains that weaken the ground. When heavy rains come in the monsoon season, landslide disasters occur in many places in the country. In particular, the northern regions of Pakistan such as GB, AJ&K and KP provinces are vulnerable to landslide disasters because of their steep hilly/mountainous topography, geological weakness, and prolonged heavy rains.

On 4 January 2010, a massive landslide in Attabad in Hunza District caused the loss of human lives and property and blocked the flow of the Hunza River converting it into a huge lake (not a glacial lake). The landslide disaster has displaced 1,163 people from Attabad while the resulting lake has displaced approximately 80 households from three villages in Upper Hunza. Damming of the Hunza River resulted in over 25,000 people being isolated in the Gojal valley due to destruction of the Karakurm Highway. In addition, a breach of Zalzal Lake, like the one that occurred due to a huge landslide immediately after the 2005 Earthquake, is one of the huge risks in northern Pakistan. Landslides on the slope of this lake resulting from rainfalls have continued to devastate downstream areas with the huge volume of sediments. The breach of the dam slope may induce catastrophic disasters in low-lying areas along the Jhelum River.

During the July-August 2010 floods, it is reported that there were landslide disasters in the following districts: Kohistan, Shangla, Haripur, Abbotabad, Mansehra, Chitral, Swat in KP province; Neelum, Muzaffarabad, Bagh, Poonch in AJ&K; and Diamer, Gilgit, and Ganche in Gilgit-Baltistan.

Although Pakistan is vulnerable to landslides, there is no comprehensive record available of the past disasters, except a few studies in AJ&K and KP prepared by GSP.

2.1.6 Cyclones

Cyclones have caused large-scale damage to the coastal areas in Pakistan. The coastal belt of Pakistan, especially in Sindh Province, is highly vulnerable to tropical cyclones and associated storm surges. The coastal belt is mostly low-lying; therefore, storm surges extend several kilometers inland damaging standing crops and converting the agricultural land into gully lands for a long time. The climate changes result in an increase in frequency, intensity and changes in tracks of storms. Tropical cyclones have caused considerable damage in the area. Such unprecedented damage to lives, property and infrastructure has had adverse impacts on the socio-economic development of the region. During the period 1971-2001, about 14 cyclones were recorded.

Recently, Cyclone Yemyin hit the coastal area of Pakistan in 2007 and killed at least 213 people in Karachi from rains and winds that might have been associated with an outer band of the cyclone, packing at least 70 mph winds that lashed at the city. The heavy downpour also flooded the Kech Korandi riverine areas, inundating the city of Turbat and forcing more than 10,000 people to evacuate their houses. The number of deaths reached at least 380 in Balochistan, 250 in Sindh and 100 in KP. The cyclone affected at least 10 districts in Balochistan and 4 districts in Sindh, affecting the lives of at least 1.5 million people. At least 2 million people were indirectly affected by the cyclone from power outages and water shortages. More than 2 million livestock, worth over Rs 4 billion, were killed by the cyclone. Property losses from the storm were estimated at Rs 24 billion.

More recently, Cyclone Phet brought extremely heavy rainfall in 2010 over the coastal areas of Balochistan (Gwadar 370 mm, Jiwani 208 mm, Pasni 139 mm) accompanied by very strong winds

gusting to 120 km/hour. On 6 June, rain started in Karachi (Masroor 133 mm, Faisal 92 mm, Saddar 84 mm up to midday of 6 June) with 35 mph winds under the influence of the cyclone disrupting the city's railways and electrical transmission systems (Figure 2.3). At least 15 people were killed, mostly by electrocution, and dozens were injured. Cyclone Phet has also left thousands of Pakistanis homeless. In the evening, the storm moved about 50 km past Karachi and made landfall between the coastlines of Thatta and Badin, causing heavy rains in the area. The Hyderabad power supply was also disrupted by the downpour.

Based on past damage by cyclones, the districts vulnerable to cyclone disasters are: Gawadar, Ketch, Lasbella, and Awaran districts in Balochistan; and Badin, Karachi, Hyderabad and Thatta in Sindh province.

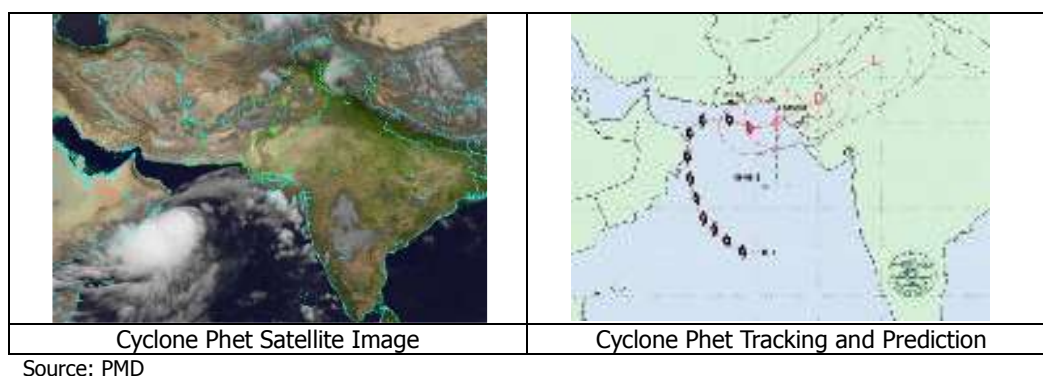


Figure 2.3 Images of Cyclone Phet in 2010

2.1.7 Droughts

Pakistan has a long latitudinal extent and the rainfall variability is very high. The climate of the country in the lower southern half is arid and hyper-arid. Some areas in the southern region remain drastically dry and are always vulnerable to droughts. If subsequent seasons fail to generate significant precipitation, the drought conditions emerge in these areas and become more severe. In this way, droughts have become an intermittent phenomenon in the country. In recent years, droughts are reported to have brought extensive damage to Balochistan, Sindh and Southern Punjab where average annual rainfall is as low as 200-250 mm.

Drought differs from other natural disasters in the sense that the effects of drought often accumulate slowly over a considerable period of time and may linger on for years even after the termination of the event. Because of this, drought is often referred to as a "creeping phenomenon." The impacts of drought are less obvious and are spread over larger geographical areas than the area damaged from other natural hazards. Consequently, drought affects more people than any other natural hazard.⁸

⁸ PMD, 2006, National Plan for Multi-Hazard Early Warning Systems

A drought is an extended period of months or years when a region notes a deficiency in its water supply. Generally, this occurs when a region receives consistently below average precipitation. It can have a substantial impact on the ecosystem and agriculture of the affected region. Although droughts can persist for several years, even a short, intense drought can cause significant damage and harm to the local economy.

The El Niño and La Niña phenomena also cause drought conditions in Pakistan. For instance, the El Niños on record occurred in 1982-1983 and 1997-98, and meteorological droughts occurred in these years in Pakistan.

During the recent past in 1998-2001, Pakistan faced one of the worst droughts in its history due to extremely low rainfall. The recorded rainfall robustly deviated in a negative direction throughout the country during these prolonged dry spells. As a consequence, minimum river flows were recorded and irrigation canals were operated at approximately half their normal volumes. Balochistan is the most vulnerable, where 23 districts were severely hit by the drought. Similarly, Dadu, Thar, and Thatta districts in Sindh, and Cholistan in Punjab were the other areas adversely affected by the prolonged dry spells. Famine-like situations were faced in severely affected areas and consequently over 3.3 million families were affected and hundreds of thousands had to migrate to 'safe areas.' Hundreds of people lost their lives due to dust and thirst. Moreover, about 30 million head of livestock were affected by the scarcity of water and fodder. The adverse impacts of droughts in Sindh and Balochistan province during this particular dry spell are summarized below.

Table 2.7 Adverse Impacts of Drought During 1998-2002

Province	Item	Affected Value
Balochistan	Human population affected	1,911,534 (32%) with 51 Casualties
	Livestock population affected	7,916,966 (30%)
	Crops affected	1,973,169 acres (45%)
	Orchards damaged	20%
	Tube wells dried	320
	Karazes dried	905
	Springs dried	63
Sindh	Area affected	22,000 Sq. km
	Population affected	1.3 million
	Departing migrants	0.3 million
	Livestock affected	5 million
	Water resources	Very large drop in groundwater levels Deterioration of groundwater quality Seawater intrusion in delta area due to reduced surface discharges

Source for Balochistan: GoB (2003).

Planning & Development Department, Balochistan, Hussain and Pomee (2004).

Source for Sindh: GoS (2000). Revenue Board of Sindh Government, Hussain and Pomee (2004).

2.1.8 Glacial Lake Outburst Floods (GLOFs)

The bursting of glacial lakes in the upstream reaches of the Indus River basin due to heat waves, a phenomenon termed Glacial Lake Outburst Floods (GLOFs), is one of the natural disasters to be concerned with in Pakistan. In particular, the Karakoram region is noted for the destructive effects of GLOFs from naturally dammed lakes. The lower parts of large glaciers in the Upper Indus River basin can severely disrupt and modify river courses in the valleys below. River channels can be diverted or partially blocked by glaciers advancing in the long term or in the short time surging across their paths from tributary valleys. If channels become completely impeded by glaciers, a lake may form upstream of the dam, eventually resulting in catastrophic flooding downstream with damage to people and property.

Glacially dammed lakes are not the only cause of outburst floods in the Karakoram. The steep relief of the region is a major factor contributing to the high frequency of landslides and debris torrents. Some slides and debris torrents are large enough to dam rivers, such as the landslides in 1841, which blocked the Indus River and formed a lake upstream. When the dam was breached, a catastrophic flood wave resulted. Similar events occurred from 1852 to 1858 on the Hunza River. In 1977, a landslide dam was formed, possibly in association with a glacier surge (Hewitt, 1968-1969).

A recent study on Indus River basin system flooding and flood mitigation by H. Rehman and A. Kamal found that, out of the 2,420 glacial lakes in the Indus basin, 52 are potentially dangerous and could result in GLOFs with serious damage to life and property.

2.1.9 Avalanches

Gilgit-Baltistan and Kashmir regions and northern parts of KP experience avalanches on a seasonal basis. Local communities surrounding the avalanche areas are vulnerable to this disaster. Avalanches are a kind of local natural disaster and their impact is localized to the communities living nearby or in areas where avalanches happen on a regular basis. Therefore, the impact of avalanches is minimal.

A study conducted by WAPDA in 1985-89 under the Snow and Ice Hydrology Project, identified potential avalanche paths.⁹ The districts vulnerable to avalanches are: Chitral and Kohistan districts in KP; Astore, Gilgit, Ghanche, Ghizer and Skardu in Gilgit-Baltistan; and Neelum and Hattian in AJ&K. Very recently on April 7, 2012 in a tragic avalanche incident as many as 135 persons including 124 army soldiers and 11 civilians buried under a huge snow slide in Gayari sector near Skardu, GB. Snow slide was covering an area of 1 sq kilometer.

⁹ Quoted from NDMA Framework 2007.

2.1.10 Traffic Accidents

In Pakistan, traffic accidents can happen anywhere. The statistics of provincial police departments show that the total number of traffic accidents reported was more than 9,700 in the years 2009-10 with half of them in Punjab province. The number of accidents is around 10,000 every year. In 2009, the Karachi Express, an express train service from Karachi to Lahore, derailed near the town of Mehrabpur in Sindh province. Fourteen of the train's sixteen carriages left the tracks.

In July 2010, an airplane crash took place at about 1000 Hrs am local time when an airbus flight of a Pakistan private airliner Ariblue, which reportedly carried 152 people including six crew members, crashed behind the mountains of the Margalla Hills that are situated in the northeast of the capital. No survivors were found after search and rescue activities.

On 20th April 2012 at about 1840 Hrs a B4-213 of Bhoja Airline operating for flight from Karachi to Islamabad crashed near Loibheer a few minutes before its landing at Benazir Bhutto International Airport. No one out of a total of 127 persons on board (passengers and crews) survived.

2.1.11 Urban and Forest Fires

Urbanization has progressed in Pakistan over the last twenty years and the urban area has increased to accommodate more people. Urban fires have become more frequent as more people live in urban areas.

Over the past 10 years, 2040.25 acres of forest area in Margalla Hills National Park rest area has been burnt in 309 fire incidents.

2.1.12 Civil Conflicts

Pakistan is ethnically, linguistically, religiously and culturally a diverse society. This diversity has some times led to civil conflicts among various social groups and has had the most impact upon women, children and minorities. These conflicts have caused loss of life and damage to property and have created insecurity for various social groups in the affected areas. Major civil conflicts by province are shown in the Table 2.8:

Table 2.8 Major Civil Conflicts by Province

Region	Description
<u>Gilgit-Baltistan (GB) Province</u>	<p>Although normal crime is negligible, the province is faced with the scourge of sectarian strife between the Shia and Sunni, well known as the "Syllabus Issue." Since mid 2004, a total of 82 deaths and 110 injuries have been observed due to the sectarian violence. This issue is rooted in the syllabus of school education based on the faith of the sects. The GB administration had several discussions with the Ministry of Education and religious leaders, and some decisions were made. As a result, the issue became dormant and normal life returned to GB. However, it has resurfaced again in recent years.</p> <p>A boundary dispute between the Diamer district of GB and the Kohistan district of KP has been observed in the construction of the Diamer-Bhasha Dam (DBD). In addition, resettlement for those affected by Diamer-Bhasha Dam construction has been an issue.</p> <p>A boundary dispute between the Chitral District of KP and the Ghizer District of GB has been observed since the 1980s regarding the ownership of Shandure Polo Field.</p>
<u>Khyber Pakhtunkhwa (KP)</u>	<p>Due to its geo-political location close to the volatile situation in Afghanistan, KP has been facing problems related to terrorism over the last decade. The most serious issue is the internationally displaced persons (IDPs) arising from the man-made disasters in 2009 in Malakand Division including the districts of Swat, Buner, Shangla, Dir Upper and Dir Lower. To facilitate the IDPs, the government of KP established 22 camps at different locations where 37,593 IDP families were housed. Furthermore, standing crops were damaged and a large number of livestock was lost in the operation. In addition, both public and private infrastructure was badly affected. PDMA has been engaged in reconstruction, rehabilitation and settlement activities through establishing the Provincial Reconstruction, Rehabilitation and Settlement Authority (PaRRSA) under the PDMA in close liaison with the federal government and International Aid Agency.</p>
<u>Federally Administered Tribal Areas (FATA)</u>	<p>FATA have the issue of civil conflict, which has led to 2,567 dead, 3,018 serious injured and 164 minor injured including civilians, Levies & Khasadar peoples, and civil servants. In addition, 315 buildings for education, 579 buildings for governance, and 87 buildings for public health engineering were damaged due to man-made disasters.</p>

2.2 Dynamic Pressures

Climate change/variation, rapid population growth and urbanization, and environmental degradation cause significant pressures in the increasing vulnerability of Pakistani society and economy to natural disasters.

2.2.1 Climate Change

Currently, it is essential to consider the phenomena of climate change in disaster risk management. The IPCC Fourth Assessment Report (2007) describes the progress of global climate change. It has concluded that warming of the climate system is unequivocal, as is now evident from observations of increases in air and ocean temperatures, widespread melting of snow and ice, and the rising global average of sea level. Related to these climate changes, the following issues have been observed¹⁰:

¹⁰ IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

- The maximum area covered by seasonally frozen ground has decreased by about 7% in the Northern Hemisphere since 1900, with a decrease in spring of up to 15%.
- Significantly increased precipitation has been observed in northern and central Asia. Drying has been observed in parts of southern Asia.
- The frequency of heavy precipitation events has increased over most land areas, consistent with warming and observed increases of atmospheric water vapour.

Based on such observations and facts regarding the relationship between flood/precipitation pattern change and climate change, future conditions are expected as follows:

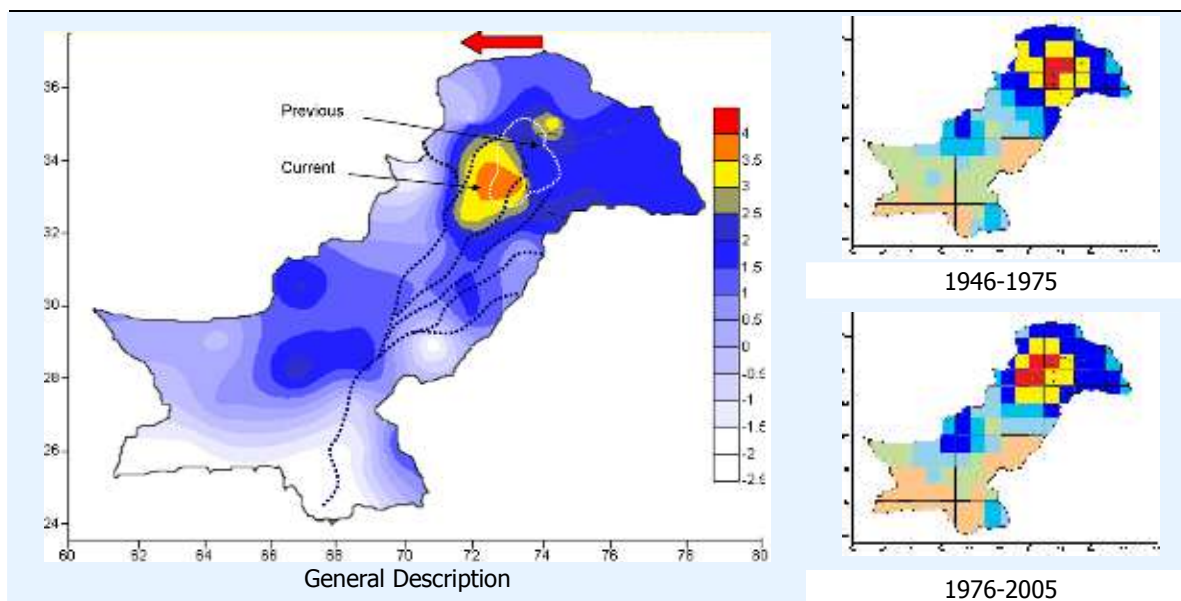
- Snow cover is projected to contract. Widespread increases in thaw depth are projected over most permafrost regions.
- It is very likely that extreme heat, heat waves and heavy precipitation events will continue to become more frequent.
- It is likely that future tropical cyclones will become more intense, with larger peak wind speeds and heavier precipitation associated with ongoing increases of tropical sea surface temperatures.

Climate change is a significant concern regarding disaster management, especially in relation to floods in Pakistan. The decrease of glaciers in northern areas will attribute to the reduction of floodwater capacity volume in each dam. Further, heavy precipitation events and the intensification of tropical cyclones will result in increased havoc due to flash floods and river floods.

A number of simulations and calculations were conducted based on the scenario of the IPCC Fourth Assessment Report. One of the significant features caused by climate change is the increase of river flow. A study¹¹ shows that river flow discharges in Pakistan may increase by approximately 10% in the years 2081-2100.

The precipitation pattern has changed in Pakistan over the last century. The amount of precipitation has increased significantly in the northern part of Pakistan. In addition, a study by PMD found that there has been a shift of precipitation toward the west by about 60-80 km (Figure 2.4). The National Disaster Management Plan should take into consideration these changes in precipitation patterns that might be caused by climate change.

¹¹ Impact of Climate Change on River Discharge Projected by Multimodel Ensemble, Nohara, et al., 2006



Source: Mr. Azmat Hayat Khan, Director, NDMC, PMD

Figure 2.4 Latitudinal Redistribution of Precipitation in Pakistan

As for the studies and research activities regarding climate change in Pakistan, a Task Force on Climate Change (TFCC) was established in the Planning Commission of Pakistan in October 2008. The National Climate Change Policy, formulated by the Ministry of National Disaster Management (now Ministry of Climate Change) in April 2011, provides a framework for addressing the issues that Pakistan faces or will face in the future due to the changing climate. The report of the said TFCC on Climate Change has been used for preparation of this policy. Furthermore, extensive consultations with provinces, federal institutions and civil society have provided valuable inputs to the policy document. In view of Pakistan's high vulnerability to adverse impacts of climate change, in particular extreme events, adaptation effort is the main focus of this policy document. The vulnerabilities of various sectors to climate change have been highlighted and appropriate adaptation measures have been spelled out. These cover policy actions addressing sectors including "Disaster Preparedness" with other concerns, such as water resources, agriculture, forestry, coastal areas, biodiversity and various vulnerable ecosystems.

Climate change is likely to increase climate-related natural disasters with a projected increase in the frequency and intensity of extreme climate events, including floods, droughts, cyclones, landslides triggered by heavy rains and urban flooding due to congestion on storm drainage.

Particularly in Pakistan, climate change is intensifying the above-mentioned hazards. Most disasters or hazards that lead to destruction cannot be prevented; thus, neither can their impacts.

In this connection, the National Climate Change Policy describes following measures to mitigate and minimize the damage by disasters that have been intensified due to climate change:

- a. Allocate adequate financial and other resources to implement the “National Disaster Risk Management Framework” formulated by NDMA.
- b. Clearly define a coordination mechanism outlining the roles and responsibilities of each concerned department during natural disasters.
- c. Redesign and upgrade the storm drainage capacity of major cities, especially Karachi and Lahore, keeping in view the likely increase in climate change-related short duration intense rainfall events.
- d. Strengthen early warning systems and develop communities’ evacuation plans for vulnerable coastal and other areas against cyclones and sea storms.
- e. Construct cyclone shelters in vulnerable coastal areas.
- f. Redesign and construct disaster resilience multipurpose school buildings to be used as shelter during natural calamities.
- g. Ensure community participation in early warning dissemination and disaster risk reduction activities, particularly in developing evacuation plans.
- h. Ensure that the elderly, the disabled, children and women get particular focus in evacuation strategies.
- i. Set up appropriate mechanisms to monitor the development of glacial lakes and develop evacuation strategies in case of Glacial Lake Outburst Floods (GLOF) for vulnerable areas.
- j. Undertake risk mapping for possible avalanches and landslides in vulnerable mountain areas and take precautionary measures accordingly.
- k. Undertake GIS mapping of all existing irrigation infrastructure especially flood embankments for efficient monitoring and flood management.
- l. Establish local flash flood forecasting & warning systems in vulnerable mountainous areas.
- m. Strengthen flood forecasting, drought monitoring & early warning systems in the country.
- n. Enhance the capacities to address the impacts of floods, flash floods, droughts, etc. by strengthening relevant agencies.
- o. Develop an ‘assessment and compensation mechanism’ including insurance of losses and damage in the aftermath of disasters and measures for rehabilitation.
- p. Develop a mix of strategies for flood management, which may include use of dams for managing flood peaks, retarding basins, providing escape channels, etc.
- q. Undertake formulation and enforcement of “River Flood Plain” regulations and laws.

- r. Undertake dam break studies to analyze flood routing, etc.
- s. Ensure the required strengthening and enhancement of barrage capacity.
- t. Undertake hydrological modeling and flood plain mapping/zoning of the Indus River system against climate change scenarios to estimate various projected flood levels.
- u. Plan, design, construct and strengthen appropriate flood embankments, dykes, and protective bunds to protect flood plains in the light of likely flood levels.
- v. Ensure that infrastructure, including telecommunication, power, utilities and transport, are resilient to the impact of climate change, particularly to the extreme weather events.

2.2.2 Population Growth, Urbanization and Environmental Degradation

Rapid population growth has become a major pressure affecting all aspects of social, economic and environmental life in Pakistan. The total population has grown over the last half century from 33.7 million in 1951 to 132.3 million in 1998 (Table 2.9). The increased population has affected life in multiple ways in creating hazard vulnerabilities. For example, the increased population has pushed people to move and live in hazard prone areas, which were traditionally considered as uninhabitable, e.g., flood plains, steep slopes and coastal areas. Population growth in upstream areas has increased the demand for fuel wood, fodder and timber, leading to uncontrolled forest cutting, causing intensified erosion and higher peak flows that result in severe flooding downstream. The high population density in hazard prone areas causes greater loss of life and property when disasters occur.

Pakistan is in transition from an agricultural and rural society to an urban and industrial society. In fact, rapid urbanization has been experienced in Pakistan for the last few decades. The urban population has increased much faster than the overall population. Between 1951 and 1998, the urban population increased by more than 7 times. The annual growth rate of urban population was about 5 percent during the 1950s and 1960s, while the overall population growth rate was between 2.4 percent and 3.9 percent during the period. Between 1981 and 1998, the growth rate of urban population was about 3.5 percent, while it was 2.7 percent for the overall population. In 1951, about 18 percent of the country's population lived in urban areas but it rose to 33 percent in 1998. The urbanization entails infrastructure development, environmental degradation and water and air pollution, etc. City life demands better services and infrastructure, which consume more natural resources (land, water, forest) to sustain urban lifestyles. Accordingly, disaster management in urban areas is a critical issue in Pakistan.

If population growth trends continue at current rates, it is estimated that the population in Pakistan will increase from 184 million in 2010 to 335 million in 2050.¹² A far greater number of

¹² World Population Prospect Database, 2008, UN

people will be living in urban areas and hazard prone areas in the coming years. This leads to environmental degradation in urban areas and accelerated exploitation of natural resources in the countryside and upstream. Thus, degrading the environment will cause an increased frequency of hazards and greater loss of life and property if disasters occur.

Table 2.9 Population Growth in Pakistan, 1951-1998

Province/Region	Population					1981-98 AVERAGE ANNUAL GROWTH RATE
	1951	1961	1972	1981	1998	
PAKISTAN	33,740,167	42,880,378	65,309,340	84,253,644	132,352,279	2.69
Rural	27,754,670	33,225,806	48,715,689	60,412,173	89,315,875	2.33
Urban	5,985,497	9,654,572	16,593,651	23,841,471	43,036,404	3.53
Khyber Pakhtunkhwa	4,556,545	5,730,991	8,388,551	11,061,328	17,743,645	2.82
Rural	4,051,800	4,972,475	7,192,896	9,395,675	14,749,561	2.69
Urban	504,745	758,516	1,195,655	1,665,653	2,994,084	3.51
FATA	1,332,005	1,847,195	2,491,230	2,198,547	3,176,331	2.19
Rural	1,332,005	1,822,547	2,477,930	2,198,547	3,090,858	2.02
Urban	-	24,648	13,300	-	85,473	-
PUNJAB	20,540,762	25,463,974	37,607,423	47,292,441	73,621,290	2.64
Rural	16,972,686	19,988,052	28,424,728	34,240,795	50,602,265	2.32
Urban	3,568,076	5,475,922	9,182,695	13,051,646	23,019,025	3.39
SINDH	6,047,748	8,367,065	14,155,909	19,028,666	30,439,893	2.8
Rural	4,279,621	5,200,047	8,430,133	10,785,630	15,600,031	2.19
Urban	1,768,127	3,167,018	5,725,776	8,243,036	14,839,862	3.52
BALUCHISTAN	1,167,167	1,353,484	2,428,678	4,332,376	6,565,885	2.47
Rural	1,022,618	1,125,016	2,029,094	3,655,604	4,997,105	1.85
Urban	144,549	228,468	399,584	676,772	1,568,780	5.07
ISLAMABAD	95,940	117,669	237,549	340,286	805,235	5.19
Rural	95,940	117,669	160,908	135,922	276,055	4.25
Urban	-	-	76,641	204,364	529,180	5.7

Source: Population Census Organization, Government of Pakistan
http://www.statpak.gov.pk/depts/pco/statistics/pop_major_cities/pop_major_cities/html

2.2.3 Hazard Trend

The past disaster events in Pakistan show that the disaster situation in the country is an annual phenomenon. Climate change and changes in precipitation will bring more hydro metrological disasters to the country with the damage location shifting to the west side of Pakistan. New settlements are expected to expand to hazard prone zones that are recognized by local people and local governments. The trend may continue in the future because the population growth in Pakistan remained high at about 2.7 percent during 1981 to 1998. In conclusion, Pakistan's future disasters will be more frequent and their impact on social, economic and environmental factors will be greater than that of today. Disasters will be experienced more frequently in Pakistan.

2.3 Vulnerability Analysis

2.3.1 Definition and Overview

Vulnerability is the condition determined by physical, social, economic and environmental factors or processes, which increases the susceptibility of a community or society to the impact of hazards. In this regard, the scale or density of population, property and product amounts/yields are some of the most significant vulnerability indices from the physical and economic points of view. According to the census data collected by the Ministry of Economic Affairs and Statistics, the population and agricultural product yield are concentrated in Punjab and Sindh Provinces. These viewable and available indices can be used to evaluate the risk for the whole of Pakistan.

2.3.2 Physical Vulnerabilities

It is stressed that a physical vulnerability that is subject to all disasters is the poor quality of construction of housing structures, buildings and infrastructure (particularly rural). Most of the rural housing in Pakistan is adobe, which is extremely vulnerable to hazards like earthquakes, floods and landslides. In AJ&K, FATA, GB and KP, people build houses by piling stones upon each other without any reinforcement. The indigenous practice of light-weight, timber-laced construction has given way to massive masonry and reinforced concrete construction which provides adequate protection against harsh weather but is often too poorly constructed to withstand strong earthquakes or heavy rainfall that can cause the adobe houses to collapse.

Table 2.10 Type and Age of Construction Materials for Private Housing

Province	Percentage of Houses using Vulnerable Materials		Percentage of Houses that are 10 years old or more
	in Wall *1	in Roof *2	
AJK	No Data	No Data	No Data
Balochistan	80.1	86.3	62.4
FATA	57.7	89.7	78.0
GB	No Data	No Data	No Data
KP	39.6	78.6	70.6
Punjab ICT	30.9	67.0	53.7
Sindh	50.2	69.8	51.0
Whole of Pakistan	39.9	70.4	55.9

Original Source:

Census Data in 1998

Note *1:

Use of unbaked bricks/earth bound and wood/bamboo

*2:

Use of cement/iron sheets and wood/bamboo

The place where people construct their houses is also one of the issues regarding vulnerability. Often there is no other possibility than to build a house or road in a position known to be at risk. Mountain people lack access to hazard-resistant building technologies and construction materials. In floodplains along the Indus River, thousands of acres of "Katcha" lands have been illegally encroached upon by local influential people or have been leased out at nominal charges resulting in erection of private bunds. Construction of houses and other built-up properties have been

allowed along riverbanks, canals, etc. Similarly, there has been a surge of encroachments on acquired lands in pond areas of barrages, which has aggravated the flood hazard.

On the other hand, urban housing and infrastructure suffers from a lack of implementation of building codes. The mushrooming of slums and urban poverty has further compounded unsafe construction practices. Even a city like Quetta, which was devastated by an earthquake in 1935, doesn't follow safe construction practices. Reasons lie in the lack of political will, business interests, corruption, a lack of information and trained manpower resulting in complex vulnerabilities.

The peculiar physical vulnerabilities of mountain communities in northern Pakistan (GB, AJ&K and northern KP) are caused by physical isolation and scattered settlement patterns. Development of infrastructure for health, education, safe drinking water and sanitation is usually overlooked due to high construction costs and the nature of the terrain.

Lack of communications infrastructure and critical facilities further aggravate vulnerabilities in communities in post-disaster situations throughout the whole of Pakistan.

The insufficient EWS capacity and the distinction of accuracy of prediction of weather information and disaster warnings are also a considerable vulnerability index. Hypodense automatic weather observation networks are scattered into mainly Punjab and Sindh Provinces. Existing meteorological radar networks are also limited. Several accurate flood warning systems have been established for the lower reaches of the Indus Major Rivers for two major dams, Tarbela and Mangla, and the capital area for a small nullah. The remaining areas covered by unspecified early warning systems have been exposed to higher vulnerability in terms of a lack of information regarding hazards.

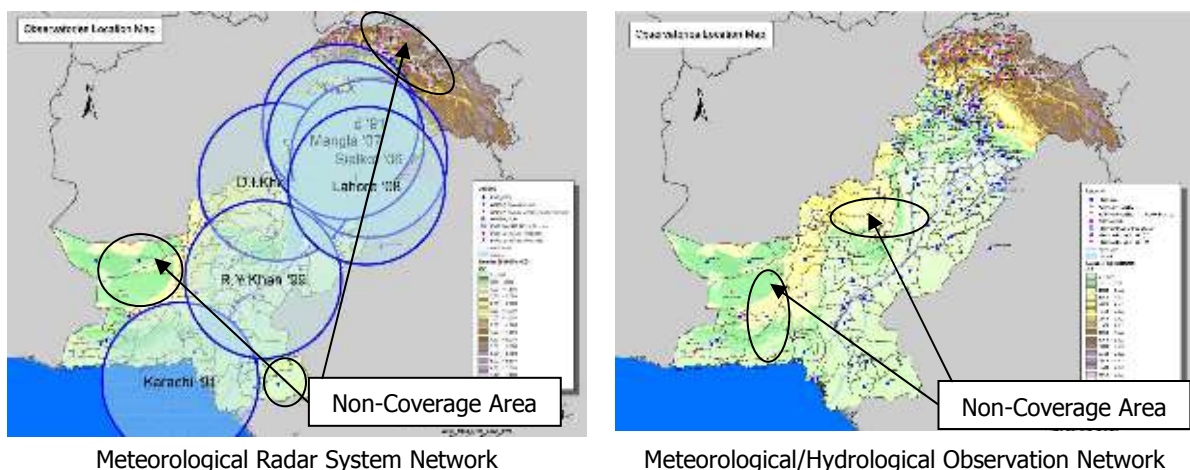


Figure 2.5 Existing Meteorological Observation Networks

2.3.3 Social and Economic Vulnerabilities

It is deemed that the main causes of vulnerability to hazards in Pakistan have resulted from ignorance of the people and the destitution of the country.

Nearly one-third of Pakistani people are living under the poverty line, and many of these are living in hazard prone areas. This social segment, which struggles to cope with daily life risks, cannot be expected to make disaster risk reduction a priority, and therefore suffers severely from disasters when they do occur. One of the physical vulnerabilities of the inhabitants in severely vulnerable areas might be attributed to this social issue.

In the 2010 Pakistan Flood, it was stated that in many areas people ignored warnings about impending disasters for various reasons including lack of awareness, education and local society issues.

The high demand for water has led to improper irrigation management, which has induced and worsened the flood and drought conditions. This is one of the social and economic vulnerabilities.

2.3.4 Environmental Vulnerabilities

The fragility of the natural environment in upstream areas of the Indus River basin has also exacerbated conditions of vulnerability. Due to massive deforestation, the rate of soil erosion is quite high in the GB. Pakistan has been left with only 4% forest and vegetative cover, in contrast to the required 25%, thereby causing an intense increase in the discharge of water and in sudden GLOFs, especially during monsoon seasons. This, coupled with increasing snowmelt in the Himalayan glaciers, has intensified flood and landslide risks. Pressures upon forests and other natural resources need to be released in order to reduce vulnerabilities. In addition, these fragile ecosystems have also caused soil erosion, landslides and a loss of bio-diversity resulting in the increase of disaster damage.

Overgrazing of marginal lands in Balochistan and arid areas in other regions, and cultivation of water intensive crops, such as rice and sugar cane, has worsened the drought conditions. A many-fold increase in livestock population in arid zones has led to overexploitation of range lands without providing them time to recover. Simultaneously, extensive installation of tube wells in Balochistan has accelerated extraction of groundwater and is lowering the water tables quite rapidly. Solutions to drought and water shortage problems in arid zones require modifications in agricultural and livestock management practices; e.g., reduction in the size of livestock population to make it compatible with the carrying capacity of rangelands and replacement of water-intensive crop varieties with drought resistant crops.

2.4 Risk Assessment

The purpose of risk assessment in the National Disaster Management Plan is to identify districts vulnerable to natural hazards, such as floods, earthquakes, tsunamis, landslides, cyclones, droughts, GLOFs and avalanches.

2.4.1 Definition of Risk

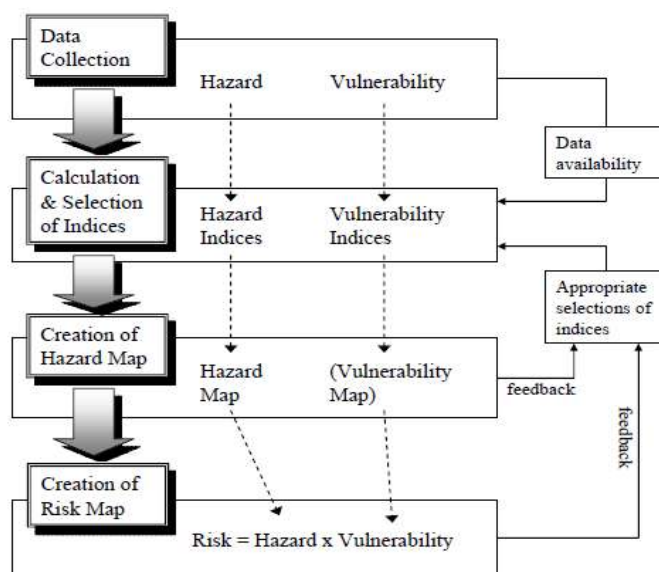
According to NDMA, risk is defined as “The chances of losses (deaths, injuries, property, livelihoods, economic activity disrupted or environmental damage) resulting from interactions between hazards and vulnerable social conditions. Risk is expressed as $\text{Risk} = \text{Hazards} \times \text{vulnerability}$.”

Hazard risk assessment is a method to determine the nature and extent of risk by analyzing potential hazards and evaluating existing vulnerabilities that could pose a potential threat to people, property, livelihoods and the environment.

2.4.2 Hazard and Risk Maps per District

The conceptual flow chart for the creation of hazard maps and risk maps is shown in Figure 2.6. There are three steps to producing a hazard map, namely: 1) data collection, 2) calculation and selection of indices, and 3) creation of the hazard map. Further, a risk map is derived based on the formula “ $\text{Risk} = \text{Hazard} \times \text{Vulnerability}$ ” using the hazard map and the vulnerability indices (or possibly a map representing “Vulnerability”).

At the data collection stage, the base data of hazards and vulnerabilities will be collected (e.g., affected disaster district, damage amount, rainfall, soil, slope condition, surface ground condition, population, housing units, principal crop yields, etc.). Then, the indices for hazard and vulnerability will be calculated during the calculation and selection of indices stage; they will be referred to as the candidate indices. The most appropriate indices for hazard and vulnerability can be selected from among the candidate indices after the trial derivations of the hazard map and risk map. After the selection of indices, the hazard map is created as the summation of the indices at the stage of creating hazard maps. A vulnerability map, consisting of the relevant selected indices, can also be created if necessary. Finally, the risk map can be created with the use of the formula “ $\text{Risk} = \text{Hazard} \times \text{Vulnerability}$,” which is the result of the “Creation of Risk Map” stage.



Source: JICA study team

Figure 2.6 Conceptual Flow Chart for Creation of Hazard Maps and Risk Maps

Risk is composed of hazards and vulnerabilities. Hazards and vulnerabilities are represented by their respective indices. Each index is derived or calculated based on the basic data collected from various information sources. The indices used for creation of hazard maps and risk maps are shown in Table 2.11 below.

Table 2.11 Indices Used for Creation of Hazard Maps and Risk Maps

Disaster Type	Hazard Indices	Vulnerability Indices
Flood	- Disaster records per district - Districts affected by 2010 Flood	- Population density - Principal crop yields
Landslide	- Disaster records per district - Slope - Soil - Mean annual rainfall	- Population density
Earthquake	- Seismic zone	- Population density
Tsunami	- Coastal elevation	- Population density
Cyclone	- Disaster records per district - Coastal elevation	- Population density - Principal crop yields
Drought	- Mean annual rainfall - Irrigation density	- Population density - Principal crop yields

Source: JICA Study Team

2.4.3 Overall Risk Assessment per District

The hazards and vulnerabilities can be overlaid for the analysis of the risk with the use of GIS software. Basically, the values of each layer were divided into five levels indicating from high hazard/risk to low hazard/risk. In the hazard risk map "red" means high hazard/risk and "blue" means low hazard/risk (hazard and risk maps are shown in Appendix-I). The results of risk assessment per district are summarized in Table 2.12.

Table 2.12 Relative Severity of Various Risks per District (1)

Rank	No.	Province	District	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk	PDMA Policy	Total
1	S7	Sindh	Karachi	4	1	5	5	5	5	1	1	5	30
2	A9	A.J.K	Hattian	5	5	5	-	2	3	4	1	5	25
3	A5	A.J.K	Muzaffarabad	5	5	5	-	2	3	5	5	5	25
4	K5	Khyber Pakhtunkhawa	Charsadda	5	3	5	-	2	3	5	1	5	23
5	K21	Khyber Pakhtunkhawa	Shangla	5	4	5	-	2	4	5	5	3	23
6	K20	Khyber Pakhtunkhawa	Sawat	5	5	4	-	2	2	5	5	5	23
7	K18	Khyber Pakhtunkhawa	Nowshera	5	3	5	-	2	3	4	1	5	23
8	A8	A.J.K	Sudhnoti	5	5	5	-	2	5	1	1	1	23
9	A7	A.J.K	Poonch	5	5	5	-	2	5	1	1	1	23
10	A10	A.J.K	Haveli	5	5	5	-	2	5	5	1	1	23
11	A1	A.J.K	Bagh	5	5	5	-	2	5	5	1	1	23
12	K16	Khyber Pakhtunkhawa	Mansehra	4	5	4	-	2	1	4	5	5	21
13	S4	Sindh	Hyderabad	5	1	4	-	4	5	1	1	1	20
14	S22	Sindh	Thatta	4	1	2	3	4	1	1	1	5	20
15	S20	Sindh	Tando Muhammad Khan	5	1	4	-	4	5	1	1	1	20
16	S2	Sindh	Dadu	5	1	2	-	2	5	1	1	5	20
17	S15	Sindh	Qamber and Shahdadkot	5	1	3	-	2	4	1	1	5	20
18	S1	Sindh	Badin	4	1	3	-	5	2	1	1	5	20
19	P30	Punjab	Rawalpindi	4	5	5	-	2	3	1	1	1	20
20	K4	Khyber Pakhtunkhawa	Buner	5	4	4	-	2	4	4	1	1	20
21	F1	FATA	Bajaur Agency	3	3	5	-	2	2	5	1	5	20
22	B3	Balochistan	Bolan	4	3	3	-	2	3	1	1	5	20
23	A6	A.J.K	Neelum	4	4	4	-	1	2	4	4	5	20
24	A3	A.J.K	Kotli	4	3	5	-	2	5	1	1	1	20
25	S19	Sindh	Tando Allahyar	4	1	4	-	4	5	1	1	1	19
26	K19	Khyber Pakhtunkhawa	Peshawar	5	3	5	-	2	3	4	1	1	19
27	F4	FATA	Mohmand Agency	3	4	4	-	1	2	3	1	5	19
28	B7	Balochistan	Jaffarabad	5	1	3	-	2	3	1	1	5	19
29	S11	Sindh	Matari	5	1	4	-	2	5	1	1	1	18
30	P33	Punjab	Sheikhupura	5	2	4	-	2	4	1	1	1	18
31	K24	Khyber Pakhtunkhawa	Upper Dir	4	5	4	-	2	2	4	5	1	18
32	K22	Khyber Pakhtunkhawa	Swabi	5	3	5	-	2	2	5	1	1	18
33	K2	Khyber Pakhtunkhawa	Bannu	4	2	5	-	2	4	1	1	1	18
34	K1	Khyber Pakhtunkhawa	Abshtabad	3	5	5	-	2	2	5	1	1	18
35	F2	FATA	Khyber Agency	3	4	3	-	1	2	3	1	5	18
36	B20	Balochistan	Nasirabad	5	1	3	-	2	2	1	1	5	18
37	A4	A.J.K	Mirpur	3	3	4	-	2	5	1	1	1	18
38	S8	Sindh	Kashmore	5	1	3	-	2	5	1	1	1	17
39	S6	Sindh	Jamshoro	5	1	2	-	3	5	1	1	1	17
40	S5	Sindh	Jacobabad	5	1	3	-	2	5	1	1	1	17
41	S17	Sindh	Shikarpur	5	1	3	-	2	5	1	1	1	17
42	S14	Sindh	Nawabshah	5	1	2	-	3	5	1	1	1	17
43	S13	Sindh	Naushahro Feroze	5	1	3	-	2	5	1	1	1	17
44	S12	Sindh	Mirpur Khas	4	1	3	-	4	4	1	1	1	17
45	P28	Punjab	Rahim Yar Khan	5	1	3	-	2	5	1	1	1	17
46	P22	Punjab	Multan	4	1	4	-	2	5	1	1	1	17
47	K7	Khyber Pakhtunkhawa	D. I. Khan	5	1	2	-	2	2	1	1	5	17
48	K3	Khyber Pakhtunkhawa	Batagram	3	4	4	-	2	3	4	5	1	17
49	K17	Khyber Pakhtunkhawa	Mardan	5	3	5	-	2	1	5	1	1	17
50	K14	Khyber Pakhtunkhawa	Lower Dir	4	4	5	-	2	1	5	1	1	17
51	B24	Balochistan	Quetta	3	1	5	-	2	5	1	1	1	17
52	S9	Sindh	Khairpur	5	1	2	-	2	5	1	1	1	16
53	S3	Sindh	Ghotki	5	1	2	-	2	5	1	1	1	16
54	S18	Sindh	Sukkur	5	1	2	-	2	5	1	1	1	16
55	P9	Punjab	Guiranjwala	5	2	4	-	2	2	1	1	1	16
56	P26	Punjab	Okara	3	1	5	-	2	4	1	1	1	16
57	P24	Punjab	Nankana Sahib	3	2	4	-	2	4	1	1	1	16
58	P23	Punjab	Muzaffargarh	5	1	3	-	2	4	1	1	1	16
59	P21	Punjab	Mianwali	4	4	3	-	2	2	1	1	1	16
60	P10	Punjab	Gujrat	5	2	5	-	2	1	1	1	1	16
61	K9	Khyber Pakhtunkhawa	Haripur	3	5	4	-	2	1	4	1	1	16
62	K8	Khyber Pakhtunkhawa	Hangu	3	3	4	-	2	3	1	1	1	16
63	K15	Khyber Pakhtunkhawa	Malakand	4	3	5	-	2	1	4	1	1	16
64	I1	Capital Territory	Islamabad	2	3	5	-	2	3	1	1	1	16
65	F6	FATA	Orakzai Agency	2	4	3	-	2	4	1	1	1	16
66	B8	Balochistan	Jhal Magsi	4	1	2	-	2	2	1	1	5	16
67	A2	A.J.K	Bhimber	4	2	3	-	2	4	1	1	1	16
68	S21	Sindh	Tharparkar	3	1	2	-	4	4	1	1	1	15
69	S10	Sindh	Larkana	5	1	2	-	2	4	1	1	1	15
70	P8	Punjab	Faisalabad	3	1	4	-	2	4	1	1	1	15
71	P35	Punjab	Toba Tek Singh	3	1	4	-	2	4	1	1	1	15
72	P34	Punjab	Sialkot	5	1	5	-	2	1	1	1	1	15
73	P31	Punjab	Sahiwal	3	1	4	-	2	4	1	1	1	15
74	P25	Punjab	Narowal	5	1	5	-	2	1	1	1	1	15
75	P12	Punjab	Jhang	5	1	3	-	2	3	1	1	1	15
76	K23	Khyber Pakhtunkhawa	Tank	4	1	3	-	2	4	1	1	1	15
77	B25	Balochistan	Sibi	3	1	2	-	1	3	1	1	5	15
78	B17	Balochistan	Loralai	3	2	3	-	2	4	1	1	1	15
79	P7	Punjab	D. G. Khan	5	1	2	-	2	3	1	1	1	14
80	P32	Punjab	Sargodha	4	2	3	-	2	2	1	1	1	14

Scoring Key	Very High 5	High 4	Medium 3	Low 2	Very Low 1	Non Hazard -
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Table 2.13 Relative Severity of Various Risks per District (2)

Rank	No.	Province	District	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk	PDMA Policy	Total
81	P29	Punjab	Rajanpur	5	1	2	-	2	3	1	1	1	14
82	P19	Punjab	Lodhran	3	1	3	-	2	4	1	1	1	14
83	P18	Punjab	Leiah	5	1	2	-	2	3	1	1	1	14
84	P16	Punjab	Khushab	4	2	3	-	2	2	1	1	1	14
85	P15	Punjab	Khanewal	3	1	3	-	2	4	1	1	1	14
86	P14	Punjab	Kasur	3	1	4	-	2	3	1	1	1	14
87	P13	Punjab	Jhelum	3	2	4	-	2	2	1	1	1	14
88	F12	FATA	FR Peshawar	2	3	3	-	2	3	1	1	1	14
89	B14	Balochistan	Killa Saifullah	3	3	3	-	1	3	1	1	1	14
90	B10	Balochistan	Kech	3	1	1	-	4	4	1	1	1	14
91	S23	Sindh	Umerkot	3	1	2	-	3	3	1	1	1	13
92	S16	Sindh	Sanghar	4	1	2	-	3	2	1	1	1	13
93	P6	Punjab	Chiniot	3	1	3	-	2	3	1	1	1	13
94	P36	Punjab	Vehari	3	1	3	-	2	3	1	1	1	13
95	P27	Punjab	Pakpattan	3	1	3	-	2	3	1	1	1	13
96	P20	Punjab	Mandi Bahauddin	3	1	4	-	2	2	1	1	1	13
97	P17	Punjab	Lahore	3	1	4	-	2	2	1	1	1	13
98	K12	Khyber Pakhtunkhawa	Kohistan	3	4	3	-	1	1	4	4	1	13
99	K11	Khyber Pakhtunkhawa	Kohat	3	2	3	-	2	2	1	1	1	13
100	F7	FATA	South Waziristan Agency	2	2	2	-	1	1	1	1	5	13
101	P2	Punjab	Bahawalnagar	3	1	2	-	2	3	1	1	1	12
102	P11	Punjab	Hafizabad	3	1	3	-	2	2	1	1	1	12
103	K6	Khyber Pakhtunkhawa	Chitral	3	4	2	-	1	1	2	3	1	12
104	F9	FATA	FR D. I. Khan	1	1	2	-	1	2	1	1	5	12
105	B9	Balochistan	Kalat	3	3	3	-	1	1	1	1	1	12
106	B23	Balochistan	Pishin	2	1	4	-	1	3	1	1	1	12
107	B1	Balochistan	Awaran	2	1	1	-	3	4	1	1	1	12
108	P3	Punjab	Bahawalpur	2	1	2	-	2	3	1	1	1	11
109	K13	Khyber Pakhtunkhawa	Lakki Marwat	3	1	3	-	2	1	1	1	1	11
110	G7	Gilgit-Baltistan	Hunza-Nagar	3	4	2	-	1	-	2	3	1	11
111	G2	Gilgit-Baltistan	Diamir	3	4	2	-	1	-	2	3	1	11
112	F10	FATA	FR Kohat	2	3	3	-	1	1	1	1	1	11
113	B29	Balochistan	Harnai	3	1	2	-	1	3	1	1	1	11
114	B2	Balochistan	Barkhan	3	1	3	-	1	2	1	1	1	11
115	B18	Balochistan	Mastung	2	2	3	-	1	2	1	1	1	11
116	B13	Balochistan	Killa Abdullah	3	1	3	-	1	2	1	1	1	11
117	B12	Balochistan	Khuzdar	3	1	1	-	1	4	1	1	1	11
118	P5	Punjab	Chakwal	2	1	3	-	1	2	1	1	1	10
119	P1	Punjab	Attock	2	2	3	-	1	1	1	1	1	10
120	G6	Gilgit-Baltistan	Skardu	3	3	2	-	1	-	2	3	1	10
121	G5	Gilgit-Baltistan	Gilgit	3	3	2	-	1	-	2	3	1	10
122	G4	Gilgit-Baltistan	Ghizer	3	3	2	-	1	-	2	3	1	10
123	G3	Gilgit-Baltistan	Ghanche	3	3	2	-	1	-	2	3	1	10
124	F8	FATA	FR Bannu	1	2	2	-	1	1	1	1	3	10
125	F5	FATA	North Waziristan Agency	2	2	2	-	1	2	1	1	1	10
126	F3	FATA	Kurram Agency	3	2	2	-	1	1	2	1	1	10
127	B6	Balochistan	Gwadar	1	1	2	-	1	3	1	1	1	10
128	B16	Balochistan	Lasbela	2	1	1	-	3	1	1	1	1	10
129	B27	Balochistan	Ziarat	1	1	4	-	1	1	1	1	1	9
130	P4	Punjab	Bhakkar	3	1	2	-	1	1	1	1	1	9
131	K10	Khyber Pakhtunkhawa	Karak	2	2	2	-	1	1	1	1	1	9
132	G1	Gilgit-Baltistan	Astore	2	3	2	-	1	-	2	3	1	9
133	B15	Balochistan	Kohlu	2	2	2	-	1	1	1	1	1	9
134	F13	FATA	FR Tank	1	1	1	-	1	1	1	1	3	8
135	B4	Balochistan	Chagai	2	1	1	-	1	2	1	1	1	8
136	B28	Balochistan	Washuk	2	1	2	-	1	1	1	1	1	8
137	B26	Balochistan	Zhob	2	1	2	-	1	1	1	1	1	8
138	B22	Balochistan	Panjgur	1	1	1	-	1	3	1	1	1	8
139	B21	Balochistan	Nushki	2	1	2	-	1	1	1	1	1	8
140	B11	Balochistan	Kharan	2	1	2	-	1	1	1	1	1	8
141	F11	FATA	FR Lakki Marwat	1	1	2	-	1	1	1	1	1	7
142	B5	Balochistan	Dera Bugti	1	1	2	-	1	1	1	1	1	7
143	B30	Balochistan	Sherani	1	1	2	-	1	1	1	1	1	7
144	B19	Balochistan	Musakhel	1	1	2	-	1	1	1	1	1	7
145	D1	Disputed Area	Disputed Area	-	3	-	-	-	-	-	-	1	4

Scoring Key	Very High	High	Medium	Low	Very Low	Non Hazard
	5	4	3	2	1	-

Source: JICA Study Team

Chapter.3 Institutional Systems for Disaster Management

This section presents institutional systems for disaster management in Pakistan, including roles and responsibilities of the stakeholders, mainly at the national level. The institutional systems for disaster management are based on a review of the National Disaster Management Act 2010 and discussions with relevant stakeholders.

3.1 Evolution of Disaster Management Systems in Pakistan

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 is responsible for disaster relief at the national level. It provides assistance in cash and kind to supplement the resources of the provincial government and administers the Prime Minister's Flood Relief Fund.

The 2005 Earthquake occurred in October 2005 and brought death to more than 75,000 people in the northern areas of Pakistan. The heavy damage brought about by the earthquake has led Pakistan to initiate national efforts in developing a structure for disaster management focusing on prevention, mitigation and integration of responses by conducting a review of traditional disaster management systems and policies on emergency response.

The National Disaster Management Ordinance (NDMO) was promulgated in 2006, was approved by Parliament, and became the National Disaster Management Act in 2010. The National Disaster Management Commission (NDMC) headed by the Prime Minister was established to expedite the formulation of overall policies at the national level. The National Disaster Management Authority (NDMA) is the focal point in charge of disaster management at the federal level. NDMA provides technical guidelines to national and provincial level Organizations on formulation of plans, strategies and programs for disaster risk management. NDMC will formulate the policies, decisions and advice of NDMA and the Chairman of NDMA will act as secretary of the NDMC. On October 26, 2011 the Government of Pakistan placed NDMA under the newly established Ministry of National Disaster Management which was later renamed as Ministry of Climate Change on April 18, 2012.

Pakistan has three levels of governances: national, provincial/state and district levels. At the provincial/state level, the Provincial/State Disaster Management Authorities (F/G/S/PDMAs)¹³ are the focal points of the disaster management. Similar to the national level, the Provincial Disaster Management Commission (PDMC) is headed by the Chief Minister (or Prime Minister in AJ&K) of

¹³ Disaster Management Authorities at the regional level include DMAs in special administrative areas (FATA and Gilgit Baltistan), DMA in state (AJ&K) and PDMAs in 4 provinces: Punjab, Sindh, Khyber Pakhtunkhwa and Balochistan. F/G/S/PDMAs is the abbreviation of these disaster management authorities at the regional level.

the respective province who acts as Chairman of the Commission. At the district level, the District Disaster Management Authorities (DDMAs) are established in selected hazard prone areas.

3.2 Roles and Functions of Disaster Management Organizations

The roles and functions of the disaster management Organizations are regulated by the Act as follows.

3.2.1 National Disaster Management Commission (NDMC)

The National Commission shall consist of:

- The Prime Minister of Pakistan who shall be the Chairperson, ex officio
- Leader of the Opposition in the Senate
- Leader of the Opposition in the National Assembly
- Minister for Defence
- Minister for Health
- Minister for Foreign Affairs
- Minister for Social Welfare and Special Education¹⁴
- Minister for Communications
- Minister for Finance
- Minister for the Interior
- Governor, Khyber Pakhtunkhwa (for FATA)
- Chief Ministers of all the provinces
- Prime Minister, AJ&K
- Chief Executive, Gilgit-Baltistan
- Chairman, JCSC or his nominee
- Representatives of civil society or any other person appointed by the Prime Minister.

The powers and functions of the National Commission are to:

- Lay down policies on disaster management.
- Approve the National Plan.

¹⁴ Under the 18th Constitutional Amendment, the Ministry of Social Welfare and Special Education was devolved into provincial governments.

- Approve plans prepared by the ministries or divisions of the federal government in accordance with the National Plan.
- Lay down guidelines to be followed by the federal government and provincial authorities; arrange for, and oversee, the provision of funds for the purpose of mitigation measures, preparedness and response.
- Provide such support to other countries affected by major disasters as the federal government may determine.
- Take such other measures for the prevention of disaster, or the mitigation thereof, or for preparedness and capacity building for dealing with disaster situations as it may consider necessary.

3.2.2 National Disaster Management Authority (NDMA)

The powers and functions of the National Authority shall be to:

- Act as the implementing, coordinating and monitoring body for disaster management.
- Prepare the National Plan to be approved by the National Commission.
- Implement, coordinate and monitor the implementation of the national policy.
- Lay down guidelines for preparing disaster management plans by different ministries or departments and the provincial authorities.
- Provide necessary technical assistance to the provincial governments and the provincial authorities for preparing their disaster management plans in accordance with the guidelines laid down by the National Commission.
- Coordinate response in the event of any threatening disaster situation or disaster.
- Lay down guidelines for, or give directions to the concerned ministries or provincial governments and the provincial authorities regarding measures to be taken by them in response to any threatening disaster situation or disaster.
- For any specific purpose or for general assistance, requisition the services of any person and such person shall be a co-opted member and exercise such power as conferred upon him by the Authority in writing.
- Promote general education and awareness in relation to disaster management.
- Perform such other functions as the National Commission may require.

3.2.3 Provincial/State Disaster Management Commission (PDMC/SDMC)

The Provincial/State Commission shall consist of:

- Chief Minister of the province (Prime Minister in AJ&K) who shall be chairperson, ex official
- Leader of the opposition and one member nominated by him to be a member of the provincial disaster commission
- Other members to be nominated by the Chief Minister
- The Chairperson of the Provincial Commission may designate one of the members nominated under clause (c) to be the Vice Chairperson.

The powers and functions of Provincial Commission are to:

- Lay down the provincial disaster management policy.
- Lay down the Provincial Plan in accordance with the guidelines laid down by the National Commission.
- Approve the disaster management plans prepared by the departments of the provincial government.
- Review the implementation of the plan.
- Oversee the provision of funds for mitigation and preparedness measures.
- Review the development plans of the different departments of the province and ensure that prevention and mitigation measures are integrated therein.
- Review the measures being taken for mitigation, capacity building and preparedness by the departments of the provincial government and issue such guidelines or directions as may be necessary.

3.2.4 Provincial/State Disaster Management Authorities (F/G/S/PDMAs)¹⁵

The powers and functions of Provincial/State Authority are to:

- Formulate the provincial disaster management policy obtaining the approval of the Provincial Commission.
- Coordinate and monitor the implementation of the National Policy, National Plan and Provincial Plan.
- Examine the vulnerability of different parts of the province to different disasters and specify prevention or mitigation measures.
- Lay down guidelines to be followed for preparation of disaster management plans by the provincial departments and district authorities.

¹⁵ The Provincial Disaster Management Authorities include Punjab, Sindh, Balochistan and Khabar Pakhtunkhawa (KP). FATA and Gill-Git are special administrative status. AJ&K is an independent state.

- Evaluate preparedness at all governmental and non-governmental levels to respond to disaster and to enhance preparedness.
- Coordinate response in the event of disaster.
- Give directions to any provincial department or authority regarding actions to be taken in response to disaster.
- Promote general education, awareness and community training in this regard.
- Provide necessary technical assistance or give advice to district authorities and local authorities to enable them to carry out their functions effectively.
- Advise the provincial government regarding all financial matters in relation to disaster management.
- Examine the construction in the area and if it is of the opinion that the standards laid down have not been followed, it may direct the owner and/or builder to make such changes or repairs as are necessary to bring the constructs into compliance with such standards.
- Ensure that communication systems are in order and disaster management drills are being carried out regularly.
- Perform such other functions as may be assigned to it by the National or Provincial Authority.

3.2.5 District Disaster Management Authorities (DDMAs)

The District Disaster Management Authority shall consist of the following members, namely:

- Head of the local council at the district level who shall be the chairperson, ex officio
- District Coordination Officer
- District Police Officer, ex-officio
- Executive District Officer Health
- Such other district level officers, to be appointed by the district government.

The powers and functions of District Authority are to:

- Prepare a disaster management plan including district response plan for the district.
- Coordinate and monitor the implementation of the National Policy, Provincial Policy, National Plan, Provincial Plan and District Plan.
- Ensure that the areas in the district vulnerable to disasters are identified and measures for the prevention of disasters and the mitigation of their effects are undertaken by the departments of the government at the district level as well as by the local authorities.

- Ensure that the guidelines for prevention, mitigation, preparedness and response measures as laid down by the National Authority and the Provincial Authority are followed by all departments of the government at the district level and the local authorities in the district.
- Give directions to different authorities at the district level and local authorities to take such other measures for the prevention or mitigation of disasters as may be necessary.
- Lay down guidelines for preparation of disaster management plans by the departments of the government at the district level and local authorities in the district.
- Monitor the implementation of disaster management plans prepared by the departments of the government at the district level.
- Lay down guidelines to be followed by the departments of the government at the district level.
- Organize and coordinate specialized training programs for different levels of officers, employees and voluntary rescue workers in the district.
- Facilitate community training and awareness programs for prevention of disaster or mitigation with the support of local authorities, governmental and non-governmental Organizations.
- Set up, maintain, review and upgrade the mechanisms for early warnings and dissemination of proper information to the public.
- Prepare, review and update district level response plans and guidelines.
- Coordinate with, and give guidelines to, local authorities in the district to ensure that pre-disaster, during disaster and post-disaster management activities are carried out promptly and effectively.
- Review development plans prepared by the departments of the government at the district level, statutory authorities or local authorities with a view to make necessary provisions therein for prevention or mitigation of disasters.
- Identify buildings and places that could, in the event of a disaster situation, be used as relief centres or camps and make arrangements for water supply and sanitation in such buildings or places.
- Establish stockpiles of relief and rescue materials and ensure preparedness to make such materials available on short notice.
- Provide information to the Provincial Authority relating to the different aspects of disaster management.

- Encourage the involvement of non-governmental Organizations and voluntary social-welfare institutions working at the grassroots level in the district for disaster management.
- Ensure communication systems are in order and disaster management drills are carried out periodically.
- Perform such other functions as the provincial government or provincial authority may assign to it or deem necessary for disaster management in the district.

For the purpose of assisting, protecting or providing relief to the community in response to any disaster, the District Authority may:

- Give directions for the release and use of resources available with any department of the government and the local authority in the district.
- Control and restrict vehicular traffic to, from and within, the vulnerable or affected area.
- Control and/or restrict the entry of any person into and/or his movement within a disaster area.
- Remove debris, conduct searches and carry out rescue operations.
- Provide shelter, food, drinking water and essential provisions, healthcare and services.
- Establish emergency communication systems in the affected area.
- Make arrangements for the disposal of the unclaimed dead bodies.
- Direct any department of the government of the province, and/or any authority or body under that government at the district level to take such measures as are necessary in its opinion.
- Require experts and consultants in the relevant fields to advise and assist, as it may deem necessary.
- Procure exclusive or preferential use of amenities from any authority or person.
- Construct temporary bridges and/or other necessary structures and demolish structures that may be hazardous to the public or aggravate the effects of the disaster.
- Ensure that the non-governmental Organizations carry out their activities in an equitable and non-discriminatory manner.
- Take such other steps as may be required or warranted to be taken in such a situation.

3.2.6 Federal Ministries

The following federal ministries shall take measures for the purpose of disaster management:

- Ministry of Communications

- Ministry of Defence
- Ministry of Climate Change
- Ministry of Economic Affairs and Statistics
- Ministry of Finance and Revenue, Planning and Development
- Ministry of Food Security and Research
- Ministry of Foreign Affairs
- Ministry of Housing and Works
- Ministry of Human Rights
- Ministry of Industries
- Ministry of Information and Broadcasting
- Ministry of Information and Technology
- Ministry of Interior
- Ministry of Law, Justice and Parliamentary Affairs
- Ministry of Petroleum and Natural Resources
- Ministry of Ports and Shipping
- Ministry of Railways
- Ministry of Regulations and Services
- Ministry of Science and Technology
- Ministry of Water and Power

In order to promote decentralization of administration power from federal ministries to the provincial level, the 18th Constitutional Amendment was enacted in 2010 and 2011¹⁶. It affects disaster management at the national level. One of the most significant changes in devolution related to disaster management is the establishment of the Ministry of Disaster Management in October 2011.

¹⁶ Under the 18th Constitutional Amendment, ten (10) ministries were devolved in December 2010, and April 2011. They are: the Ministry of Culture, Ministry of Education, Ministry of Livestock and Dairy Development, Ministry of Local Government and Rural Development, Ministry of Population Welfare, Ministry of Religious Affairs, Ministry of Social Welfare and Special Education, Ministry of Special Initiatives, Ministry of Tourism, and Ministry of Youth Affairs. An additional seven (7) ministries were devolved in June, 2011: the Ministry of Environment, Ministry of Food and Agriculture, Ministry of Health, Ministry of Labour and Manpower, Ministry of Minorities, Ministry of Sports, and Ministry of Women Development. In October 2011, four (4) ministries were constituted in accordance with the notification of the Cabinet Office, namely the Ministry of National Heritage and Integration, Ministry of Disaster Management, Ministry of National Regulations and Services and Ministry of Food Security and Research.

The roles and responsibilities of each federal ministry in disaster management, including pre-, during and post-disaster phases, are shown in Appendix-II.

3.2.7 Federal Departments and Authorities

The following departments and authorities shall take measures for the purpose of disaster management:

- Capital Development Authority
- Civil Aviation Authority
- Civil Defence
- Coast Guard
- Federal Flood Commission (FFC)
- Fire Fighting Services
- Geological Survey of Pakistan
- National Crisis Management Cell (NCMC)
- Emergency Relief Cell (ERC)
- National Highway Authority (NHA)
- National Housing Authority
- National Logistics Cell (NLC)
- Pakistan Armed Forces
- Pakistan Housing Authority
- Pakistan Meteorological Department (PMD)
- Pakistan Commissioner for Indus Waters (PCIW)
- Pakistan Public Works Department
- Pakistan Railways
- Police (including Levis and Khasadar in FATA)
- Space and Upper Atmosphere Research Commission (SUPARCO)
- Survey of Pakistan
- Traffic Police
- Water and Power Development Authority (WAPDA)

The roles and responsibilities of each federal department and/or authority during pre-disaster, emergency response, and post-disaster phase are shown in Appendix-II.

3.2.8 Community Organizations

Community level organizations will play key roles in disaster management. Community organizations are intermediate organizations between local government and individuals and they will promote disaster management activities. The community level organizations shall work closely with local governments such as tehsil, town authorities, and union councils.

3.2.9 Individuals

The basic principal of disaster management is that each person shall protect his own life from disaster and each community shall protect themselves. It is important that residents have knowledge of disaster and countermeasures against disaster situations. The individuals and community organizations shall work together with local governments to protect lives and assets. For the purpose of promoting effective disaster management, individuals need to participate in disaster management drills and training.

3.2.10 University and Research Institutes

To reduce the disaster risk, knowledge of science and technology is very important. In this connection, universities and research institutes should play important roles in disaster risk management, including development of innovative measures for mitigation and preparedness, collection of disaster-related information, formulation of the collaboration among industry-government-academia, assessment of hazards and risks, and so on.

3.2.11 International Agencies

International agencies, including the United Nations and multi-lateral and bilateral donors, shall play important roles in disaster risk management in Pakistan. In collaboration with government and other stakeholders, international agencies shall work to improve disaster management systems, support capacity development and strengthen institutions in disaster management.

3.2.12 Volunteers

Volunteers may play important roles in disaster reduction activities. Volunteer activities should be expanded in all aspects of disaster prevention, emergency response, and recovery and rehabilitation. In order to enrich the volunteer activities, the government shall make an effort to create opportunities to share information among volunteer groups and relevant entities and provide useful information.

3.2.13 Other Key Stakeholders

Other key stakeholders in relation to disaster management are:

- Infrastructure Sector
- Banks
- Insurance Sector
- Hospitals
- Telecommunications Companies
- Media
- Private Sector

These stakeholders shall prepare their own operation plan against disasters. Private companies shall be a part of the community and provide assistance to the local people in case of disaster situations. Drills and training shall be carried out periodically in the companies.

3.3 Disaster Management Planning System

According to the National Disaster Management Act 2010, each disaster management organization, NDMA, F/G/S/PDMAs and DDMA, shall prepare a disaster management plan as illustrated in the Figure below. Each plan is defined below:

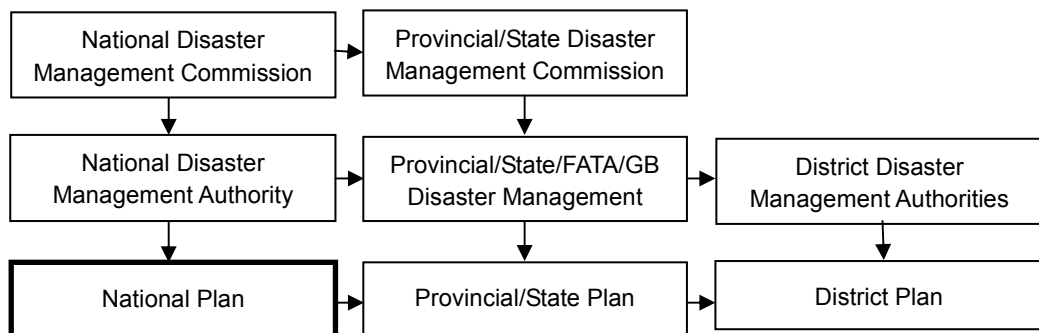


Figure 3.1 Disaster Management System in Pakistan

3.3.1 National Plan

- (1) There shall be a plan drawn up for disaster management for the whole country to be called the National Plan.
- (2) The National Plan shall be prepared by the National Authority having regard to the national policy and in consultation with the provincial governments and expert bodies or organizations in the field of disaster management, and approved by the National Commission.
- (3) The National Plan shall include:
 - a) Measures to be taken for the prevention of disasters and/or the mitigation of their effects.
 - b) Measures to be taken for the integration of mitigation measures in the development plans.
 - c) Measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disasters.
 - d) Roles and responsibilities of different ministries or divisions of the federal government in respect of measures specified in clauses (a), (b) and (c).
- (4) The National Plan shall be reviewed and updated annually.
- (5) The federal government shall make appropriate provisions for financing the measures to be carried out under the National Plan.

3.3.2 Provincial Plan

- (1) There shall be a plan for disaster management for every Province/State/Special Administrative Territory to be called the Provincial/State Disaster Management Plan.
- (2) The Provincial/State Plan shall be prepared by the Provincial/State Authority having regard to the guidelines laid down by the National Authority after consultation with the district government.
- (3) The Provincial/State Plan shall include:
 - a) Vulnerability of different parts of the province/state to different forms of disasters.
 - b) Measures to be adopted for prevention and mitigation of disasters.
 - c) The manner in which the mitigation measures shall be integrated with the development plans and projects.
 - d) Capacity building and preparedness measures to be taken.
 - e) Roles and responsibilities of each department of the province/state in relation to the measures specified in clauses (b), (c) and (d).

- f) Roles and responsibilities of different departments of the government of the province in response to any threatening disaster situation or disasters.

(4) The Provincial Plan shall be reviewed and updated annually.

3.3.3 District Plan

(1) There shall be a plan for disaster management for every district of the province/state/special administrative territory.

(2) The District Plan shall be prepared by the District Authority having regard to the National Plan and the Provincial Plan.

(3) The District Plan shall be reviewed and updated annually.

3.3.4 National Disaster Response Plan

In addition to the above national, provincial/state and district disaster management plans, NDMA formulated the National Disaster Response Plan in March 2010 to enhance the country's ability to manage all disasters through a comprehensive national approach. The NDRP has become an official document and provides Standard Operating Procedures (SOPs) at national, provincial/state and district levels for emergency response.

3.3.5 Other Disaster Management Plans

The federal ministries, departments and authorities shall prepare disaster management operation plans to identify the roles and responsibilities of each organization for the purpose of disaster management. Public corporations and the private sector shall prepare business continuation plans to minimize the economic damage in the case of disasters.

The disaster management operation plans shall include:

- (1) Measures to be taken in the case of disaster situations.
- (2) Communication and coordination mechanisms within the organizations and other ministries and agencies.

3.4 Disaster Management Drills and Training

NDMA shall organize disaster management drills at the national level in cooperation with provincial and district governments. Disaster management drills aim at verifying and confirming the emergency responses of disaster-related organizations and at enhancing public awareness of disaster prevention and preparedness. Specific objectives of the drills and training are:

- (1) To verify the functional effectiveness of disaster-related organizations under normal conditions by confirmation and evaluation through disaster management drills, and to realize smooth mutual cooperation among the organizations.

- (2) To provide the public with an opportunity to become aware of and learn about disaster management in order to enable individuals to understand appropriate actions to be taken during a disaster and make adequate preparations against disasters.
- (3) To provide an opportunity for building capacity of individuals in disaster management, which leads to enhancement of the disaster control of the society.

3.5 Disaster Management Fund

In accordance with the Disaster Management Act 2010, funds for disaster management shall be prepared as follows.

3.5.1 National Fund for Disaster Management

- (1) The federal government may, by notification in the Official Gazette, constitute a fund to be called the National Disaster Management Fund to meet any threatening disaster situation or disaster.
- (2) The National Disaster Management Fund shall be financed from the following sources, namely:
 - a) Grants made by the federal government.
 - b) Loans, aid and/or donations from national or international agencies.
 - c) Donations received from any other source.
- (3) The following funds shall become part of the National Disaster Management Fund, namely:
 - a) The Prime Minister's Disaster Relief Fund.
 - b) Any other fund relatable to natural calamities established at the federal level such as those the federal government may determine.
- (4) The National Disaster Management Fund shall be kept in one or more accounts maintained by the National Authority, in local or foreign currency, in any scheduled bank in Pakistan and shall be operated in accordance with the directions of the National Authority.
- (5) The National Disaster Management Fund shall be administered by the National Authority towards meeting the expenses for emergency preparedness, response, mitigation, relief and reconstruction.

3.5.2 Establishment of Funds by Provincial/State Governments

- (1) The provincial/state governments shall, immediately after notifications issued for constituting the Provincial/State Authority and the District Authorities, establish the fund to be called the Provincial/State Disaster Management Fund.

- (2) The Provincial/State Disaster Management Fund shall be financed from the following sources, namely:
 - a) Grants made by the federal government or provincial/state governments.
 - b) Loans, aid and/or donations from national or international agencies provided in accordance with prescribed procedure.
- (3) The Provincial/State Disaster Management Fund shall be kept in one or more accounts maintained by the Provincial/State Authority, in local or foreign currency, in any scheduled bank in Pakistan and shall be operated in accordance with the directions of the Provincial/State Authority.
- (4) The Provincial/State Disaster Management Fund shall be administered by the Provincial/State Authority towards meeting the expenses for emergency preparedness, response, mitigation, relief and reconstruction in the province.

3.5.3 Allocation of Funds by the Federal and Provincial Governments

The federal government and provincial/state governments shall, in their annual budgets, make provisions for funds for the purposes of carrying out the activities and programs set out in its disaster management plan.

3.5.4 Emergency Procurement and Accounting

Where by reason of any impending disaster situation or disaster and the National Authority or Provincial Authority or District Authority is satisfied that immediate procurement of provisions or materials or the immediate application of resources are necessary for rescue or relief, it may authorize the concerned department or authority to make the emergency procurement and in such case, the standard procedure requiring inviting of tenders shall be deemed to be waived.

3.6 National Disaster Response Force

In the wake of the 2010 and 2011 floods, the tremendous loss of life and property and the inadequate response capacity of the government brought to light the acute need for a specialized response mechanism, whereby the life-saving needs of disaster-hit communities may be effectively met. Such a mechanism would be particularly useful for carrying out search and rescue and evacuation operations within rural and urban settings. Therefore, to address the existing gap, a National Disaster Response Force shall be established across the country to offer vital response services in a threatening disaster situation or disaster. In line with Section 27 of the National Disaster Management Act 2010, which stipulates that establishment of a National Disaster Response Force, the institutionalization of such a force would be an appropriate next step.

The proposed TORs including composition of the Response Force shall be:

- i. The Response Force will be established in the country to effectively respond to disasters and emergencies.
- ii. It will comprise of 86 members, each based on International Search and Rescue Advisory Group (INSRAG) standards, and will be provided all necessary equipment, as per INSRAG guidelines.
- iii. It will be under the operational command of the respective FATA/GB/State/ Provincial Disaster Management Authority (F/G/S/PDMAs) and their trainings shall be provided at Emergency Services Academy, Lahore, NIDM and in other related institutions both in country and abroad.
- iv. The general supervision, direction and operation of the Force shall be prescribed by NDMA in consultation with F/G/S/PDMAs.
- v. The Response Force shall also be deployed anywhere in the world by the NDMA, upon request made to it through diplomatic channel.

Chapter.4 National Intervention and Strategies for Disaster Management

This section presents comprehensive national intervention and strategies for disaster management. The national intervention and strategies are long-term orientations to establish efficient and effective disaster management systems in Pakistan. The actions/programs are measures to be taken over the next ten years.

4.1 Key Issues in Disaster Management in Pakistan

Pakistan continues to suffer from a plethora of natural and man-made hazards that threaten to affect the lives and livelihoods of its citizens. The natural disasters include floods, earthquakes, landslides, cyclones, and drought. The man-made disasters include human conflicts, accidents, and infrastructure failure. Over the last few years, Pakistan has experienced large natural disasters, such as the 2005 Earthquake, 2010 Cyclone Phet and 2010 Pakistan Flood, which caused significant impact on human lives and the national economy in Pakistan.

Key issues in disaster management can be categorized into the following six areas.

4.1.1 Strengthen Disaster Management Administration at National, Provincial and Local Levels

The government of Pakistan established NDMA, F/G/S/PDMAs and DDMA as key organizations in disaster management at national, provincial and local levels respectively. However, the disaster management organization at the national level has not been established with clear roles and responsibilities among the federal ministries. Moreover, linkages between NDMA and F/G/S/PDMAs are quite weak and there is no clear coordination mechanism between NDMA and DDMA. Since the NDRMF was prepared in 2007, Pakistan has experienced heavy flood damage in 2010 and 2011. The coordination mechanism of disaster management among national, provincial and local levels needs to be strengthened.

4.1.2 Enhance Disaster Management System in the Stages of Pre-, During and Post-Disaster Periods.

Emergency response has remained a predominant activity of disaster management in Pakistan. The Pakistani Army plays a significant role in disaster management, especially in emergency response and early recovery phases. For mitigation and preparedness in the pre-disaster stage, the disaster risk management concept should be placed in the project formulation period. During the post-disaster stage, there are no clear institutional systems or funding sources for disaster rehabilitation and reconstruction. Therefore, the district, provincial and federal governments need to prepare disaster management plans covering actions and measures to be taken in all stages of pre, during and post-disaster situations.

4.1.3 Establish Mechanisms for Monitoring and Assessment of Disaster Risks

There is a lack of knowledge and information about hazard identification, risk assessment and management, and linkages between livelihoods and disaster preparedness. Risk and vulnerability assessments of hazards are prepared by different agencies like FFC, PMD, NDMA, F/G/S/PDMAs and DDMA, but they are not effectively coordinated or integrated. Risk assessment and monitoring of hazards is essential for disaster risk management. A multi-hazard approach to disaster risk reduction should be placed into risk assessment and a multi-hazard early warning system to save lives, property and livelihoods should be established.

4.1.4 Promote Mechanism for Disaster Risk Reduction Measures into Development

Disaster risk management, development planning and environmental management operate in isolation and integrated planning between these sectors is almost completely lacking. The National Development Plan should include a disaster risk reduction approach as a part of the nation's sustainable development policies. There are no long-term, inclusive or coherent planning systems to address disaster issues with a national vision. NDMA determined ten ministries and started evaluation of development projects with reference to the disaster risk management concept. However, there is an absence of a central authority to integrate disaster management into development planning. A dedicated fund for disaster management at the federal level has never been a part of the overall development planning.

4.1.5 Promote Disaster Risk Management at Local and Community Levels

There is a lack of knowledge and skills of officials in relevant agencies and civil society in disaster management. State-level disaster preparedness and mitigation measures are oriented towards structural measures and undermine non-structural measures such as training, education and awareness of disaster risk management. Disaster related departments and organizations remain under-resourced and untrained and are not given required training and education. The community is the heart of disaster management. Enhancing the knowledge and capacities of people regarding protection of their livelihood from disasters is important in disaster management.

4.1.6 Strengthen Capacity of Stake Holders in Disaster Management

Training is an integral component of capacity building and it needs to be designed for specific needs and equipped with a practical approach. Strengthening of human resources is essential to disaster management. Participants in disaster management include government organizations at national, provincial and local levels, NGOs, CBOs, international donor agencies, private sector enterprises, religious organizations, Civil Defence, police, and the community. Since each of these have specific work areas, strengths and weaknesses, it is important for them to complement each other's efforts to achieve an efficient overall disaster management system. For the purpose of capacity building in disaster management, the National Institute Of Disaster Management (NIDM)

shall play a key role. Comprehensive disaster management courses and practical training shall be prepared by NIDM and it needs to develop symbiotic linkages with other research institutions and universities to enhance knowledge of disaster management.

4.2 National Disaster Management Intervention and Strategies

The following ten (10) national disaster management interventions are identified to establish a more efficient and effective disaster management system in Pakistan. The national disaster management interventions are guidelines covering all actions raised in the Hyogo Framework for Actions. Table 4.1 shows the national disaster management interventions in relation to the Hyogo Framework for Actions.

Table 4.1 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 the 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

HFA-1: Ensure that Disaster Risk Reduction is a National and a Local Priority with a Strong Institutional Basis for Implementation

4.3 Intervention-1: Establish the Institutional and Legal System for Disaster Management

4.3.1 Review

One of the priority areas in disaster risk management is the institutional and legal arrangements, which are intended to establish the administrative base for disaster management. The promulgation of the National Disaster Management Ordinance 2006 was the turning point of national disaster management administration in Pakistan. The Ordinance became the National Disaster Management Act in December 2010. The Act regulates disaster management organization at the national, provincial and district levels and defines the roles and responsibilities of each level of government. The disaster management administration, which is regulated by the Act, has started to function. Along with NDMA at the national level, F/G/S/PDMAs were established in all provinces and DDMA's have been established in selected hazard prone districts. The National Institute of Disaster Management (NIDM) was inaugurated in February 2010 at a tentative location in the UNDP office, which is a training and research institution regarding disaster management. Building codes and land use regulations need a more comprehensive approach for disaster management in urban areas.

4.3.2 Key Issues

Although NDRMF shows the roles and responsibilities of each ministry and department, the specific roles and responsibilities of the organizations are not clearly defined. NDRP provides the roles and responsibilities of the organizations in disaster management, but it is limited to emergency response activities. There is a need to establish a comprehensive institutional structure of disaster management including national, provincial and district levels. Each government organization should know its roles and responsibilities as well as specific tasks for all stages of pre-disaster, during-disaster and post-disaster. Furthermore, the roles and efforts to be taken by civil society, the community and individuals should be clearly established to reduce disaster risk. The government should promote and support their activities.

Relevant government organizations in disaster management should prepare for disaster risk reduction, emergency response and rehabilitation and Reconstruction Plans. Such plans should take into account the existing capacity of human resources and propose measures to enhance the capacity of the organizations. NDMA shall provide technical guidelines and coordination among the disaster management organizations by holding meetings and workshops periodically.

After formulation of the disaster management plan for each organization, drills and training should be carried out based on the plans. The results of the drills and training shall be reflected to improvement of the disaster management plans in order to ensure efficient and effective operation of the plans. At the same time, the capacity of the organizations and personnel should be improved.

4.3.3 Strategies

Strategy-1: Establish and function disaster management organizations at provincial and district levels.

Strategy-2: Formulate disaster management operation plans for relevant organizations.

Strategy-3: Implement periodic meetings among the disaster management organizations to monitor the situations.

Strategy-4: Implement drills and training on disaster management activities in the organizations to improve their capacities.

4.3.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.2 Priority Actions / Programs for the Next 10 Years (Intervention-1)

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 by provision of relevant financial resources by the provinces	F/G/S/PDMAs 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, including fire accidents	NDMA, DDMA
	2.2. NDMA prepares the guidelines for disaster operation and contingency plans for disaster management organizations, including fire accidents	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

4.4 Intervention-2: Prepare Disaster Management Plans at Various Levels

4.4.1 Review

The objective of NDMP is to minimize the adverse effects of hazards through effective disaster management measures at the national level. The plan includes interventions, strategies and actions/programs for disaster risk reduction in the stages of pre-disaster, during disaster and post-disaster periods.

NDMA has supported F/G/S/PDMAs to develop their Provincial Disaster Management Plans (PDMP). The PDMP identifies hazard-prone areas (districts/municipalities), vulnerabilities, resources

available, strategies for risk reduction, and responsibilities of various stakeholders for disaster preparedness and response. The PDMPs were formulated in 2008 with technical assistance from UNDP. NDMA has also supported F/G/S/PDMAs to work closely with 30 selected hazard-prone districts to assist them in development of their District Disaster Management Plans (DDMP). The DDMPs vary depending on the capacity of the DDMA.

NDMA also developed a National Disaster Response Plan (NDRP) in 2010, which defines roles and responsibilities of federal ministries, departments and other entities with regards to national level disaster response. The NDRP helps various line ministries, departments and entities to collaborate in providing needs-based efficient response.

4.4.2 Key Issues

Various levels of disaster management plans at national, provincial and district levels have been developed by the overall initiative of NDMA, F/G/S/PDMAs and DDMA, but the plans have not been implemented effectively due to weakness of institutional capacity and lack of funds. It is urgently necessary to develop DDMPs in the remaining districts with the support of NDMA and F/G/S/PDMAs. The existing PDMPs and DDMPs also need to be refined and modified based on the experience of the 2010 flood.

Disaster risk reduction includes various measures, such as safer construction of infrastructure, retrofitting of buildings, rainwater harvesting, relocation of housing and facilities from hazard prone areas, training, awareness raising, provision of safer sources of livelihoods, etc. Preparedness measures for disaster risk reduction involve development of warning systems and plans for evacuation and other precautionary measures to be taken during the pre-disaster period. They also involve education and training of officials, teams and communities in search and rescue, fire fighting, evacuation, mass casualty management, etc. The establishment of policies, regulations and operational plans to be executed after a disaster is also crucial. Effective plans should consider and identify securing resources; e.g., stockpiling supplies and earmarking funds.

Pakistan has experienced rapid urbanization during the last decades. Disasters in urban areas will cause extreme damage to economic assets and have a negative impact on the national economy. Disaster management plans in urban areas are highly important for disaster risk reduction. The disaster management plans in urban areas shall be prepared in collaboration with communities with support from F/G/S/PDMAs and DDMA. The plans should include identification of hazard risk areas, evacuation sites and routes, necessary response activities, etc.

It is also important to clearly define roles and responsibilities of stakeholders and to strengthen coordination amongst concerned agencies. Accordingly, it is necessary to develop sectoral disaster management operation plans in federal ministries, departments and authorities.

4.4.3 Strategies

Strategy-1: Formulate and update disaster management plans at national, provincial, district/municipality and community or TMA levels.

Strategy-2: Develop hazard specific contingency plans.

Strategy-3: Develop sectoral disaster management operational plans in federal ministries, departments and authorities.

4.4.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.3 Priority Actions / Programs for the Next 10 years (Intervention-2)

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, DDMA
	1.2. Develop district DMPs in remaining districts	F/G/S/PDMAs, DDMA
	1.3. Develop community-based DMPs at TMA level	F/G/S/PDMAs, DDMA
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 sector 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

HFA-2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning

4.5 Intervention-3: Establish National Hazard and Vulnerability Assessment

4.5.1 Review

There is no systematic information or database to understand hazard risks and vulnerability in Pakistan. Due to the lack of such information, areas vulnerable to disasters are not clearly identified, which causes difficulty in establishing disaster management interventions and decision making of resource allocation for disaster risk reduction. Accordingly, it is essential to develop a mechanism and system for monitoring hazard risk and vulnerability assessment. In fact, the Nation Disaster Risk Management Framework (NDRMF) identified the following activities as the priorities of DRM:

A Vulnerability Atlas will be prepared including hazard maps indicating the location of various hazards with zonation of risk levels. The Atlas will also include analysis of vulnerability of settlements, housing stock, important infrastructure and environmental resources.

A disaster inventory will be developed in order to facilitate analysis of disaster and vulnerability trends. These data will be utilized for the preparation of the Vulnerability Atlas. A computerized database of the Vulnerability Atlas will be produced and managed by NDMA. The database and the Vulnerability Atlas will be made available online, so that any interested stakeholders can access it.

Major water resources of Pakistan lie in the frozen north. Damage to the glaciers and ice caps will enhance disaster risks of various kinds. A study should be conducted to assess any negative impact of climate change on glaciers and ice cover in northern Pakistan.

The NDMA has identified 50 hazard-prone districts as high priority for DRM activities. The identification of hazard-prone districts should be based on scientific data and empirical data. Recently, the NDMA planned to conduct a multi-hazard vulnerability analysis in association with the French government. As a pilot project, the NDMA has conducted Hazard, Livelihood and Vulnerability (HLV) Baseline Assessment in 10 districts. The NDMA also conducted Earthquake Risk Assessment in Muzaffarabad, Mansehra, Murree, Quetta and Chitral, which aimed at integrating earthquake vulnerability reduction into development plans and schemes.

With technical support from JICA, the NDMA has prepared a database of natural hazards and their risks based on statistical data collected from relevant agencies. Much of these data are, however, based on limited sources, and therefore, further elaboration and updating of the data are needed.

As for the study on climate change, a Task Force on Climate Change (TFCC) was established in the Planning Commission of Pakistan in October 2008. The main tasks of the TFCC are to take stock of the country's situation in relation to climate change and to contribute to the formulation of policy on climate change. TFCC assists the government in achieving sustained economic growth by

addressing climate change threats to ensure the water, food and energy security of the country. In addition, WAPDA has just commenced a project to research glacier and water resources in the northern area of Pakistan. In this project, WAPDA will observe the situation of glaciers and meteorological conditions. PMD have also conducted research for glacier and glacial lakes. In line with these scientific activities conducted by related agencies, the NDMA has conducted a Risk Assessment of Glacial Lake Outburst Flooding in the Gilgit district of Gilgit-Baltistan (GB).

4.5.2 Key Issues

The database for the National Hazard and Vulnerability Assessment should be updated and elaborated through the inclusion of updated statistical data and information including historical records of hazards as well as major infrastructure such as roads, river and communication and transportation networks. It is necessary to identify the areas vulnerable to hazards on two different scales: one is to identify districts vulnerable to hazards on the national scale; and the other is to identify areas vulnerable to hazards on the urban scale. The vulnerability assessment on the urban scale is important for the purpose of disaster preparedness and mitigation, but it has not been conducted. The vulnerability assessment should contribute to future land use planning and development scenarios on both national and urban scales. In this connection, the NDMA and F/G/S/PDMAs should further conduct hazard vulnerability analysis, in particular, risk assessment in urban areas. The relevant regulations need to be established to conduct disaster prevention and management in a proper manner.

Regarding floods, national level hazard assessments along the Indus, Jhelum, Chenab, Ravi and Sutlej Rivers were conducted during 2001 to 2006 by FFC based on the scale of a 10-year return period flood and their inundation areas were delineated on a topographic map of 1:50,000. However, these maps and data should be updated based on the worst ever 2010 Pakistan Flood and the most recent 2011 Sindh Flood including Swat and Kabul Rivers as main tributaries of the Indus basin. In addition, these activities shall further be sublimated into the national flood risk assessment.

It is crucial that the current situations of climate change have had significant effects on the increase of hazards and risks in Pakistan, especially hazards of river and flash floods, sediment disasters, GLOFs, cyclones, droughts and avalanches. It is highly important that research agencies do a detailed survey of the relationships between climate change and natural hazards in Pakistan. In particular, preparation of hazard and risk maps for glacier and glacial lakes is important, because such hazards as swollen rivers, flash floods and GLOFs will occur more frequently due to climate change. Furthermore, it is essential to strengthen the capacity of research for the development of hazard and vulnerability analysis.

4.5.3 Strategies

Strategy-1: Conduct detailed multi-hazard vulnerability and risk analysis/assessments at the national level.

Strategy-2: Conduct detailed multi-hazard vulnerability and risk analysis/assessments at local levels.

Strategy-3: Conduct research and studies on the impact of climate change on glaciers and ice caps.

4.5.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.4 Priority Actions / Programs for the Next 10 Years (Intervention-3)

Strategies	Priority Actions / Programs	Responsible Organizations
1. Conduct detailed multi-hazard vulnerability and risk analysis/assessments at the 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 ERRAs
	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 ERRAs
	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: For the local levels to be targeted, districts vulnerable to disasters and highly economic and densely populated major cities with high disaster vulnerabilities (based on the disaster experiences in the past) are prioritized. Therefore, Karachi, Hyderabad, Faisalabad, Gujranwala, Sialkot, Peshawar, Lahore and ICD with their suburbs shall be included for the city level.

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

4.6 Intervention-4: Establish Multi-Hazard Early Warning and Evacuation Systems

4.6.1 Review

A multi-hazard early warning system (EWS) is a mechanism to generate advance warning and make it possible for decision makers and communities to take appropriate actions prior to a hazard.

An effective early warning system involves technical capacity for hazard monitoring and analysis of data, and a mechanism for decision-making and communication systems to disseminate warning messages to the communities. A multi-hazard EWS is vital to reduce disaster risks and losses in Pakistan.

A number of workshops to develop EWS have been held with the participation of various levels of stakeholders. For example, a national workshop on development of an early warning system for tsunamis was held by WFP. A national workshop for development of a disaster response plan was held by NDMA. The UNISDR and other related agencies also conducted workshops to enhance EWS in Pakistan.

PMD has already developed an early warning system for tropical cyclones with the establishment of the Marine Meteorology and Tropical Cyclone Warning Centre (TCWC). As of 2010, tracking of tropical cyclones in Pakistan has been done by the TCWC. As for the tsunami EWS, new equipment and facilities for the early detection and estimation of the occurrence of tsunamis have been developed by the National Seismic Monitoring and Tsunami Early Warning Centre located in Karachi and Islamabad.

PMD also established the Drought/Environmental Monitoring and Early Warning Centre (NDMC-PMD) in 2002, which is located in Islamabad, to monitor the drought situation in the country and issue timely advisories. In order to strengthen community-based activities to prepare for a drought situation, drought EWS and mitigation projects have been implemented in Tharparkar district. Indigenous knowledge based on early warning indicators for drought have been developed by the DERA and NDMA.

An Early Warning System (EWS) for floods has also been developed by PMD and it is significantly important because flood disasters cause great impact as experienced in the 2010 Pakistan Flood. In fact, the 2010 Pakistan Flood caused tremendous damage notwithstanding the release of a warning issued by PMD prior to the actual flood. More effective operation of the EWS for floods is necessary. Although an EWS for river floods has been established, there is no EWS for flash floods or landslides in Pakistan except for the Lai Nullah basin passing through Islamabad and Rawalpindi.

There is a lack of efficiency in the technical and operational capacities of relevant organizations (e.g., PMD, FFC, WAPDA, GSP, Ministry of Health, etc.) to monitor and predict hazards. This could be ameliorated by improving and expanding the existing technological networks. It is also necessary to facilitate a multi-agency interface, with strengthening the sharing of technical information on hazards among multiple agencies. The role of media is also important for dissemination of warning messages.

Disease is a man-induced hazard and a Disease Early Warning System (DEWS) has been established under the Disease Surveillance and Control Program of WHO for detecting, investigating and controlling epidemics at their earliest stages. DEWS has been implemented in 95 districts in Pakistan with the assistance of WHO, aiming to build the capability of health personnel at early detection of epidemics. In addition, the Epidemic Investigation Cell (EIC), which is a hub of disease prevention and control activities at the national level, was established with the assistance of the World Health Organization (WHO).

4.6.2 Key Issues

The most significant natural disaster was the recent 2010 Pakistan Flood, which caused nearly 1,985 deaths and Rs 855 billion of economic loss. The effects of such damage cause a vicious cycle in Pakistan; the disaster causes huge economic loss that becomes a setback in the effort to eradicate poverty and the lives of the people become worse.

A multi-hazard early warning system (EWS) is an important tool to break out of the vicious cycle and it has become a major issue in Pakistan. Until now, however, technical efforts to develop a multi-hazard EWS have not been established effectively because of insufficient cooperation between relevant agencies. It is also necessary to enhance and strengthen the technical capacity of EWS, particularly in weather forecasting systems for mitigation of hazard risks. Furthermore, communities are not aware of EWS and lack knowledge of disaster prevention measures. In this connection, risk and hazard maps at local scale for vulnerable areas, particularly against flash floods and landslides, the most pertinent localized disasters related to the early warning system, shall be prepared.

The effort to develop a multi-hazard EWS should be executed with the involvement of a number of stakeholders so that effective operations of EWS will result in numerous benefits. Reliable, efficient and effective communication and multi-hazard early warning systems are the keys to reduce disaster risk. Major stakeholders related to a multi-hazard EWS are:

Central Government - NDMA, FFC, PMD, WAPDA, GSP, ERRRA, Army

Provincial Government - F/G/S/PDMAs, Irrigation Departments, Civil Defence, Rescue 1122 (Fire Brigade)

District Government - DDMA (DCO, Revenue, etc.), Police, C&W, Civil Defence

Others - NGOs, INGOs, Mosques, Schools, Media

4.6.3 Strategies

Strategy-1: Strengthen 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.

4.6.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.5 Priority Actions / Programs for the Next 10 Years (Intervention-4)

Strategies	Actions/Programs	Responsible Organizations
1. Strengthen forecasting and early warning systems	1.1. Establishment of specialized medium range forecasting centre (SMRFC) with a meteorological radar station at Islamabad and upper air observations at designated locations	PMD
	1.2. Strengthening of flood forecasting by satellite information and hazard maps of Indus Rivers including the Kabul and Swat River system	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/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 a 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 system 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/DDMAs
	2.2. Preparation of landslide hazard maps based on topographical and geological analyses at vulnerable locations	PMD/FFC/GSP/NDMA/DDMAs
	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 a communication system between PMD and NDMA, among DMAs (NDMA-PDMA-DDMA) and a communication system utilizing cellular phone and radio broadcast networks	NDMA/F/G/S/PDMAs/D DMAs/PMD/PID/NGOs/ PTA/PEMRA/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 Info. 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 a 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

Establish Better Knowledge of Disaster Risk at Local and Community Levels

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

4.7.1 Review

The purpose of disaster risk management (DRM) training, education and awareness activities is to enhance the capacity of experts in relevant organizations and the general public to be able to conduct disaster management activities in an effective and efficient manner. The NDRMF has identified the following outputs to be achieved through DRM training, education and awareness activities.

- Technical skills and knowledge of district and municipal officials in hazard prone areas is enhanced regarding disaster risk reduction and preparedness.
- Curriculum on disaster risk management is available for training of district, municipal, provincial and national officials.
- Curriculum for media orientation on disaster risk reduction and preparedness is available.
- Awareness of parliamentarians, senators, members of political parties, members of the bureaucracy, chambers of commerce and industry enhanced about disaster risk reduction strategies.
- Curriculum for training of civil servants is available and incorporated into the syllabus of the civil service academy and other civil and military training institutions.
- Short-term courses on disaster risk management are offered in schools, colleges and universities.

Since the formulation of NDRMF in 2007, several outputs have been partially achieved. For example, DRM training courses have been offered to F/G/S/PDMAs and DDMA staff. Training courses on disaster reporting have been conducted for media staff. Policy dialogues with parliamentarians and senators have been started. Some workshops related to disaster management were offered at the Civil Services Academy and National School of Public Policy. Some subjects related to disaster management are included in the national curriculum for basic education. Accordingly, it can be said that some DRM training, education and awareness activities have been provided to various target groups of people on the initiative of NDMA with technical support from international organizations. However, the number of trainees is still limited.

4.7.2 Key Issues

There is no particular organization to coordinate and lead human resource development activities in the field of disaster management in Pakistan. Human resource development in the field of

disaster management encompasses a wide variety of activities including search and rescue training and technical research on disaster management. These activities have been conducted by various organizations. In order to manage the variety of activities in human resource development, it is essential to have an organization which takes the initiative to coordinate and boost overall human resource development activities. The NIDM should play a leading role in human resource development activities in the field of disaster management.

Considering the limited resources, human resource development requires target groups to enhance their capacities in disaster management. In order to make the society resilient to disaster damage, human resource development should start with strengthening the capacity of the general public, communities, and government agencies. These target groups should be aware of disaster mitigation and preparedness measures so that they start taking actions to mitigate future disaster damage.

Few organizations realize that human resource development in the field of disaster management is their own task. Since there are a huge number of targets, human resource development should be conducted by many organizations with mutual coordination. Major organizations to be responsible for human resource development are shown in Table 1.4.6. NIDM should take the initiative in implementing human resource development activities in various organizations.

Past experience and research results in the field of disaster management have not been well accumulated in Pakistan. A database of past records of hazards is not fully available and research in the field of disaster management has not been effectively conducted even though Pakistan has experienced huge disasters. It is necessary to enhance knowledge and technology in the field of disaster management. For this purpose, establishment of a research centre in the field of disaster management is required.

4.7.3 Strategies

Strategy-1: Develop NIDM (National Institute of Disaster Management) to promote human resource development in the field of disaster management.

Strategy-2: Enhance the capacity of government agencies in charge of disaster management.

Strategy-3: Promote mainstreaming DRR through capacity enhancement of governmental officers.

Strategy-4: Develop the capacity of communities to cope with disasters.

Strategy-5: Raise people's awareness of disaster management.

4.7.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the priority actions/programs shown in the table below.

Table 4.6 Priority Actions / Programs for the Next 10 years (Intervention-5)

Strategies	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

4.8 Intervention-6: Strengthen Awareness Program on Disaster Risk Reduction at Local Level

4.8.1 Review

The local communities, local infrastructure and local economy are directly affected by disasters. A "Community and Local Level Risk Reduction Program" is the heart of disaster risk reduction. Local communities and authorities are the first players to respond to any disaster. Considering this characteristic of the disaster situation, it is important that disaster risk reduction programs are implemented for awareness and capacity development at the local level, including local government officials, communities, and civil society organizations. Effective utilization of local resources is essential in all the stages of disaster management, i.e., preparedness, response, recovery and reconstruction. Additionally, local level disaster management plans at the villages, UCs, tehsils and districts are important in disaster risk reduction.

The NDMA has already developed district level DRM plans at selected districts/municipalities under the support of UNDP. Along with the plans, pilot activities have been conducted and disaster management cells have been established at the municipal level; and training and drills including some small-scale mitigation measures for earthquakes, tsunami, floods, cyclones, and drought have been conducted in more than twenty communities. Trainer's manuals and training manuals are developed as community-based disaster risk management (CBDRM) tools. The Pakistan Red Crescent Society (PRCS) develops training manuals on CBDRM and provides training to selected communities. PRCS has also started developing district disaster response teams who can respond to disasters at the district level and link with the communities. Both programs have started from several pilot communities and are expected to upscale to other areas in the nation. Schools are also included in the program. Recently, with financial support from the World Bank, NDMA has plans to conduct nationwide CBDRM activities for all the union councils (UCs) in the country within five years.

According to documents provided by NDMA in 2011, CBDRM activities conducted under the NDMA initiative are listed below:

- Under one-UN Joint Program, Municipal Disaster Management Cells (MDMC) were established in Muzaffarabad, Mansehra, Murree, Chitral, and Quetta Municipalities.
- Training programs were organized for construction professionals and workers (architects, engineers and masons).
- Some training is provided to community people and masons in the selected districts.
- Awareness and evacuation drills for floods and cyclones are conducted at selected districts.

- Pilot projects of mangrove plantation were conducted in the districts Thatta and Gawadar.
- Several pilot projects involving reconstruction and retrofitting of damaged or vulnerable buildings in AJ&K and KP.
- Several pilot projects involving structural mitigation measures were implemented in Muzaffarabad and Mansehra.

4.8.2 Key Issues

By reviewing these recent projects under the initiative of NDMA, the following issues are identified regarding CBDRM activities and awareness programs for the general public.

In the areas that have experienced disasters frequently, risk perceptions by citizens are relatively high. However, knowledge of disasters and countermeasures against disasters are insufficient.

Citizens are not aware that disaster risk management requires the joint effort of "self-help, mutual-help and public-help." Most citizens expect public assistance in the first place, but they are not aware of what they or neighboring communities can do for disaster risk management.

Various organizations have conducted Community-based Disaster Risk Management (CBDRM) activities, and modules and training materials have been prepared. However, formation of staff and budgets for implementation have not yet been decided. To up-scale CBDRM activities nationwide, the implementing mechanism needs to be clearly defined.

CBDRM activities are often limited to emergency response and preparedness. Some districts and tehsils have prepared development schemes, but utilizing these schemes for the mitigation measures of disaster risk management have not yet been put into practice.

Many local governments have not yet designated safe evacuation places for citizens. In some cases, even though safe evacuation places are identified, they are located too far away from the communities.

4.8.3 Strategies

Strategy-1: Enhance knowledge of disasters management in the general public.

Strategy-2: Establish safe evacuation places in the case of a disaster situation.

Strategy-3: Implement and disseminate CBDRM activities.

Strategy-4: Disseminate self-help and mutual help efforts in disaster management.

Strategy-5: Establish disaster mitigation measures incorporated with existing development programs.

4.8.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.7 Priority Actions / Programs for the Next 10 Years (Intervention-6)

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 by 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 of CBDRM at 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 ¹⁷ 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

¹⁷ 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.

HFA-3: Reduce the Underlying Risk Factors

4.9 Intervention-7: Infrastructure Development for Disaster Risk Reduction

4.9.1 Key Issues

A well-distributed and safe infrastructure is vital for disaster risk management. In Pakistan, however, the vulnerability of the population to natural hazards has increased due to rapid urbanization and population growth in disaster prone areas. In addition, inadequate management of infrastructure has caused damage to the population. The following issues of infrastructure development are to be considered for disaster risk reduction:

Many villages are remote and isolated from the rest of the country. Strengthening of physical infrastructure is vital for mitigation of underlying risk factors and effective response during disasters. It is essential to execute evaluation of physical infrastructure, especially transportation and communication facilities.

The 2005 Earthquake caused many victims amongst the school children who were under the debris of collapsed school structures. Many hospitals also collapsed in the earthquake preventing effective response for medical treatment for the victims. It is necessary to develop safer schools and hospitals to avoid repetition of such tragic episodes. Making schools and hospitals safer and building structures that are resilient against disasters have become two of the key issues for DRM in Pakistan.

The NDMA has taken every effort to reduce the hazard risks in terms of disaster mitigation measures since its establishment in 2007. These measures are mainly focused on non-structural measures such as institutional, training and capacity building activities in disaster management. At the same time, NDMA, F/G/S/PDMAs and relevant agencies should pay more attention to structural measures to reduce hazard risks.

A survey of existing flood protection facilities should be conducted and the NFPP-IV (National Flood Protection Plan) prepared by FFC should be also revised in accordance with the damage analysis of the 2010 flood. It is indispensable to conduct detailed studies on the breaching mechanism of the river bunds and damage to infrastructure during the 2010 floods by Irrigation Departments and Highway and Railway Authorities along with the Pakistan Army. It is necessary to consider rehabilitation of existing barrages so that they can accommodate basic floodwater discharges so as not to breach the flood protection bunds.

Taking into account the progress of climate change and experiences of the 2010 flood, it is necessary to establish a comprehensive flood management or integrated watershed management system in the Indus River basin including the Kabul and Swat Rivers. Based on the results of the above studies, all the design discharges of dams, barrages, and all other flood protection works

should be reviewed in terms of structural dimensions like width and height of structures to enhance safe flood discharge capacities.

Pakistan has experienced a rapid urbanization and population growth in urban areas. To prevent widespread damage due to disasters in urban areas, it is necessary that urban planning and development should consider disaster risk management. Local governments and disaster management organizations need to make efforts to create a disaster-resistant urban structure.

4.9.2 Strategies

Strategy-1: Develop schools, hospitals and other important public facilities to be safe against disasters.

Strategy-2: Develop important coastal facilities to be safe (i.e., ports and industrial facilities) against disasters taking into consideration climate change (sea level rising, increment of intensity of cyclones, etc.).

Strategy-3: Enforce the building code in construction of buildings.

Strategy-4: Implement appropriate structural and non-structural measures in flood prone areas taking into account comprehensive and integrated flood management plans.

Strategy-5: Enhance disaster risk management capacity including fire in urban areas.

4.9.3 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.8 Priority Actions / Programs for the Next 10 Years (Intervention-7)

Strategies	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/PDMAs/DDMAs
	1.2. Preparation of guidelines for new public building construction in the areas vulnerable to disasters	NDMA/PDMAs/DDMAs
	1.3. Retrofitting works of important public facilities (schools and hospitals)	NDMA/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/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/PDMAs/DDMAs
4. Implement appropriate structural measures in flood prone areas taking into account comprehensive and integrated flood management plans	4.1. Establishment of a comprehensive and integrated flood management/protection plan in Pakistan	Ministry of Water & Power/WAPDA/FFC/ Planning Commission at Federal Govt. level, PIDs/F/G/S/PDMAs PWD (Gilgit-Baltistan) /FATA Secretariat through (Irrigation Directorate), Irrigation Department, Govt. of AJ&K
	• A review of the breaching mechanism of the river embankments (flood bunds) and a review of designated breaching points	
	• Revision and updating of NFPP-IV	
	• Revision of SOPs of Tarbela Dam for flood mitigation	
	• Flood plain zoning and management including legislation of removal of encroachment from flood plain	
	• Capacity building of the stakeholders in flood mitigation	
	4.2. Construction and rehabilitation of flood control/mitigation structures	Ministry of Water & Power/ WAPDA/FFC/ Planning Commission at Federal Govt. level, PIDs/ F/G/S/PDMAs PWD (Gilgit-Baltistan) /FATA Secretariat through (Irrigation Directorate), Irrigation Department, Govt. of AJ&K
	• Implementation of NFPP-IV	
	• Construction of DRM centres in flood prone areas	
	• Retrofitting of existing dams, barrages and flood protection works to increase floodwater retarding capacity and ability to accommodate design discharges	
• Constructing of new flood protection works, dams and barrages to increase flood mitigation/protection capacity		
5. Enhance disaster risk management capacity including fire in urban areas	5.1. Formulation of an urban disaster management plan to propose corresponding countermeasures against natural hazard risk in urban areas	NDMA/PDMAs/DDMAs
	5.2. Enforcement of effective land use control and regulations based on the urban disaster management plan; introduction of space needed for evacuation and disaster relief into the land utilization program	NDMA/PDMAs/DDMAs Planning Commission
	5.3. Construction of DRM centres in areas vulnerable to urban disasters	NDMA/PDMAs/DDMAs

For Strategy 4, "Implement appropriate structural measures in flood prone areas taking into account comprehensive and integrated flood management plans," the Federal Flood Commission in 2007 prepared the Fourth National Flood Protection Plan (NFPP-IV).

In the draft NFPP-IV, the total cost provision for comprehensive country-wide flood management is Rs 50 billion. Breakup cost for the total investment of Rs. 50 billion is as shown in Table 4.9 below.

Table 4.9 Investments for National Flood Protection Plan-IV

Sr.	No. Province/Region	Estimated Cost (Rs Billion)
I	Punjab	18.75
	Sindh	12.92
	Khyber Pakhtunkhawa	4.58
	Balochistan	3.33
	Gilgit-Baltistan	0.42
	FATA	1.25
	AJ&K	0.42
II	WAPDA	0.98
	PMD	3.67
III	FFC, Capacity Building & Research Studies, etc.	3.69
Total		50.00

Source: FFC

USD 565.6 million
(IUSD=88.4 PKR)

The non-structural programs included in the updated NFPP-IV, such as programs for EWS, have been described in Intervention-4 as Establish Multi-Hazard Early Warning and Evacuation Systems.

4.10 Intervention-8: Mainstreaming Disaster Risk Reduction into Development

4.10.1 Review

The government policy on development is reducing poverty, promoting economic growth and increasing the wealth of the nation. Disaster risk reduction shall secure sustainable growth, reduce poverty and create a disaster resilient society. Therefore, mainstreaming disaster risk reduction into development is an integrated component of the development process.

The NDRMF identifies the mainstreaming of disaster risk reduction into development as one of the priority areas for disaster management in Pakistan. In order to achieve this goal, disaster risk reduction shall be a national policy and included in the National Development Plan and National Poverty Alleviation Strategy.

The recognition of disaster risk reduction is a development challenge especially in the provinces and districts with high risk of natural disasters. The guidelines for mainstreaming DRR in development were prepared by the Ministry of Industries and Production and training on mainstreaming disaster risk reduction was conducted for members of a National and Ministerial

Working Group, including ten ministries. Several member ministries finalized the ministerial strategy on DRR.

The National Planning Commission and the Ministry of Finance agreed to incorporate disaster reduction measures in the evaluation of development projects by including them in the PC-1 form. This is the first step to recognition of disaster risk reduction as a development project. In order to evaluate disaster reduction impacts in development projects, NDMA should provide guidelines to evaluate the impacts.

4.10.2 Key Issues

One of the lessons learned from the 2010 flood disaster is the importance of proper infrastructure development to reduce disaster risk in the country. In this sense, the National Development Plan should address the importance of the disaster risk reduction as a prime policy to achieve national development goals. The disaster risk reduction measures shall be beneficial to the economic development and improvement of the living condition of the people. The damage from a disaster may impact people in many ways: loss of life, loss of economic assets, loss of agricultural land, etc. Once the area is damaged by a disaster, secondary impacts will cause further problems such as disease outbreak, malnutrition, dependency on aid, etc. These negative impacts will bring about huge losses in economic and social terms.

Disaster risk reduction will improve the living condition of the people and reduce poverty in the country. For example, the construction of dams will reduce the disaster risk of floods and drought. At the same time, the construction of dams will assist in producing more agricultural products and low cost electricity. However, the construction of dams may cause negative impacts on the social and natural environments.

The Planning Commission of Pakistan should provide disaster risk reduction criteria in development projects. Provincial governments need to change or modify their proposed projects to fit disaster risk reduction criteria. A road development project, for example, can be a disaster risk reduction project if the alignment of the embankment is proper and cross drainage structures of sufficient discharge capacity are provided at appropriate locations. This will reduce the flood disaster risk by diverting the storm water to appropriate locations thereby saving agricultural land and populated areas. Construction of government buildings should adhere to the building code to reduce the impact of disaster. Therefore, updated building codes may be strictly followed in building projects and all possible disaster risk reduction measures should be taken into account.

4.10.3 Strategies

Strategy-1: Establish disaster risk reduction policies in the National Development Plan and National Poverty Reduction Strategy.

Strategy-2: Set up sectoral guidelines on mainstreaming disaster risk reduction.

Strategy-3: Establish criteria to assess development projects from a risk reduction perspective.

Strategy-4: Improve the technical capacity of federal and provincial governments to integrate risk reduction into development plans and programs.

4.10.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.10 Priority Actions / Programs for the Next 10 Years (Intervention-8)

Strategies	Priority Actions / Programs	Responsible Organizations
1. Establish disaster risk reduction policies in the 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 the technical capacity of federal and provincial governments to integrate risk reduction into development plans and programs	4.1. Prepare a 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

HFA-4: Enhance preparedness, response and recovery measures in disaster management

4.11 Intervention-9: Establish National Emergency Response System

4.11.1 Review

The success or failure of any emergency response system depends upon the availability and operational efficiency of the information architecture, which ensures communication flow between all the stakeholders. The importance of such a system in disaster management is most critical as it can ensure the delivery of information and relief services to the hazard affected areas and people.

Emergency Operations Centres (EOCs) were established at national, provincial and district levels under the overall supervision of NDMA, F/G/S/PDMAs and DDMA's respectively. The national EOC serves as a hub for receiving early warnings and issuing necessary instructions to response agencies. The provincial and district EOCs lead coordination and management of relief operations in affected areas. Civil Defence, armed forces, fire services, police, ambulance services, Red Crescent and other related agencies will be coordinated by the EOCs at respective levels.

Standard Operating Procedures (SOPs) were prepared in the NDRP and define roles and responsibilities of federal, provincial and local agencies for their involvement in emergency response activities.

A methodology and system for post-disaster damage, loss and needs assessment was developed for collaborative action by the stakeholders after the 2005 Earthquake. It includes a framework for damage and loss assessment, common reporting formats, data-collection methodologies, and roles and responsibilities of stakeholders. It also includes SOPs on activation, deployment, reporting and de-activation of assessment teams. These methods and systems were applied in the evaluation of damage, loss and needs assessment in the 2010 flood.

Under the support of UNDP, three Urban Search and Rescue (USAR) teams have been formed for the Capital Development Authority, the City District Government of Karachi and the Pakistan Army to respond to disasters.

4.11.2 Key Issues

The inability of Pakistan's emergency response system to deal with catastrophes was highlighted in the aftermath of the 2005 earthquake and the 2010 & 2011 flood disasters. It is imperative to develop a system under the management of NDMA to organize effective disaster preparedness, prevention, mitigation, response and recovery at national, provincial and district levels. Therefore, development of institutional mechanisms should be undertaken and technical and operational capacity of involved agencies should be enhanced.

In emergency response, the roles of the Civil Defence Department at federal and provincial levels are critical. However, the organization capacity is extremely weak at both federal and provincial levels. The provincial governments need to undertake proper overhauling of Civil Defence Departments to enable them to organize search and rescue, fire fighting, first aid and other response activities. This requires strengthening of the Civil Defence training academies. Other agencies that need to be strengthened include, the ERC, PRCS, police and fire services, the Ministries of the Interior and Health and NGOs.

Relevant national, provincial and local agencies will be encouraged to establish strategic locations for stockpiling essential relief items for timely provision of relief to the disaster affected people under the supervision of the NDMA, F/G/S/PDMAs and DDMA.

In proper emergency response, a database should be developed to record disaster response resources available with different departments at national, provincial and district levels. This would allow authorities to mobilize the resources and deploy them in affected areas at the time of a disaster. Relevant departments at national, provincial and district levels will submit a list of resources and equipment available to the DDMA, F/G/S/PDMAs and NDMA.

A National Disaster Management Fund shall be established in order to enable the federal government to organize emergency response effectively. The fund will also be used for recovery and reconstruction of the disaster affected areas. Possibilities for establishing catastrophe financing schemes will be explored with banks, international donors and insurance sector agencies.

Although methodology and a system for common post-disaster damage, loss and needs assessments was developed, there is a lack of capacity of professional staff, and therefore, training and capacity building activities are critical.

Pakistan Civil Defence should be closely involved in the development and management of urban search and rescue teams.

4.11.3 Strategies

Strategy-1: Establish and strengthen a warehousing or stockpiling system for storing food, medicine, relief supplies and rescue equipment at strategic locations.

Strategy-2: Enhance emergency response capacities, such as emergency operation centres, Civil Defence and urban search and rescue teams in major cities.

Strategy-3: Establish a robust communication system and efficient transport and logistics mechanism to be used during emergency situations.

Strategy-4: Develop and implement emergency response plans in relevant ministries and departments at federal, provincial and district levels.

Strategy-5: Establish a National Disaster Management Fund to enable the federal government to organize emergency response effectively.

4.11.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.11 Priority Actions / Programs for the Next 10 Years (Intervention-9)

Strategies	Priority Actions / Programs	Responsible Organizations
1. Establish and strengthen a 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	2.1. Enhance capacity development of professionals to undertake assessment of damage for the use of multiple stakeholders	NIDM
	2.2. Establish search and rescue teams for dealing with multiple hazards in provincial and regional capitals and key industrial cities	NDMA
	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 and efficient transport and logistics mechanisms 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 transport and logistic management mechanisms	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

4.12 Intervention-10: Capacity Development for Post-Disaster Recovery

4.12.1 Review

The Government of Pakistan established the Earthquake Reconstruction and Rehabilitation Authority (ERRA) to manage the recovery effort in the aftermath of the October 2005 Earthquake. The ERRA will complete its mission in the next few years. The early recovery effort in the recent 2010 flood was undertaken by NDMA but actual reconstruction work is done by provincial governments under the Planning Commission. Therefore, it is essential to establish an integrated institutional system to manage disaster recovery programs in an effective manner. NDMA should be the national Organization to work on post-disaster recovery using the knowledge and lessons learnt from ERRA.

Some capacity building activities in post-disaster recovery have already been conducted by ERRA and their experiences were shared with the NDMA. In April 2010, the report entitled, "Lessons Learned From the Experience of ERRA" was issued and a training curriculum for disaster needs assessment, and design and implementation were prepared by ERRA.

Recently, NDMA has created the Strategic Planning Unit (SPU) to provide technical support in all sectors of recovery activities, including Early Recovery Frameworks, and Sectoral Strategies for agriculture, community restoration, WASH (water, sanitation and hygiene), shelter, education, health, and information management and monitoring for the 2010 Pakistan Flood.

4.12.2 Key Issues

The 2010 Pakistan Floods caused severe damage in the Khyber Pakhtunkhwa, Sindh, Punjab, AJ&K and Balochistan regions of Pakistan. The NDMA engaged in initial measures such as preparation of evacuation centres, rescue and relief activities in cooperation with other related agencies. One of the critical issues of post-disaster recovery has been attributed to lack of a fund-raising mechanism to allocate resources in an effective manner.

Disaster Needs Assessment (DNA) is one of the important measures in post-disaster recovery. In Pakistan, however, DNAs for the 2005 earthquake and 2010 flood were conducted with the technical support of WB and ADB. There is a lack of capacity to conduct disaster needs assessment in Pakistan.

There are no guidelines for formulation of recovery and rehabilitation plans for disasters. This condition has caused the delay of recovery and rehabilitation activities and lack of cooperation among stakeholders. In Pakistan, the Disaster Management Fund can be utilized for response and early recovery activities but it does not function in an efficient manner.

4.12.3 Strategies

Strategy-1: Prepare guidelines for post-disaster recovery programs and activities.

Strategy-2: Develop the capacity of stakeholders in post-disaster recovery.

Strategy-3: Develop the system and methodology for recovery needs assessment.

4.12.4 Priority Actions and Programs to be Implemented in 2012-2022

The above strategies shall be implemented through the various actions/activities shown in the table below.

Table 4.12 Priority Actions / Programs for the Next 10 Years (Intervention-10)

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-disasters recovery and rehabilitation	NDMA, SPU in consultation with F/G/S/PDMAs
2. Develop the 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, DDMAs
	2.4. Capacity development of research activities for new techniques of recovery and rehabilitation	Research Institutes
3. Develop a system and methodology for recovery needs assessment	3.1. Preparation of guidelines for recovery needs assessment, recovery Program design and management for multiple sectors	NDMA, F/G/S/PDMAs, SPUs

4.13 Timeframe of Priority Actions and Programs

The above-mentioned interventions and strategies shall be implemented in line with the following timeframe.

- 1) Phase-1 from 2012 to 2015 (Short-Term): To Establish Institutional Basis for the Disaster Risk Management

First of all, the activities/programs for establishing the foundation for DRM shall be implemented, in order to shift the next stage smoothly.

- 2) Phase-2 from 2016 to 2018 (Mid-Term): To accomplish the actual achievements of comprehensive disaster management in priority areas.

Based on the foundation established by 2015, the comprehensive actual activities and programs shall be implemented in the priority areas.

- 3) Phase-3 from 2019 to 2021 (Long-Term): To develop the capacity of local government and disseminate the disaster activities throughout the nation.

Finally, the capacity of local governments shall be developed and the accumulated knowledge shall be disseminated throughout the nation. To fulfill this goal, the lessons learnt from past activities of phase 2 shall be handed over and utilized.

Table 4.13 Time Frame of Priority Actions and Programs (1/2)

Strategy	app. Cost (million USD)	Time Frame									
		Phase 1				Phase 2			Phase 3		
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
4.1 Intervention-1: Establish the Institutional and Legal System for Disaster Management											
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.	-										
4.2 Intervention-2: Prepare Disaster Management Plans at Various Levels											
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										
4.3 Intervention-3: Establish national hazard and vulnerability assessment											
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										
4.4 Intervention-4: Establish multi-hazard early warning and evacuation systems											
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										
4.5 Intervention-5: Promotion of training, education and awareness in relation to disaster management											
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										
4.6 Intervention-6: Strengthen awareness program on disaster risk reduction at local level											
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										

Table 4.14 Time Frame of Priority Actions and Programs (2/2)

Strategy	app. Cost (million USD)	Time Frame									
		Phase 1				Phase 2			Phase 3		
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
4.7 Intervention-7: Infrastructure development for disaster risk reduction											
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										
4.8 Intervention-8: Mainstreaming disaster risk reduction into development											
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	-										
4.9 Intervention-9: Establish national emergency response system											
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.	-										
4.10 Intervention-10: Capacity Development for Post Disaster Recovery											
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										
Total Cost (million USD)	1,040.90										
Total Cost (billion PKR)	92.02										

1USD=88.4PKR

Chapter.5 Disaster Management Measures in Geological Hazards

5.1 Introduction

Since the extent of damage and serious losses caused by a catastrophic earthquake are devastating, pre-disaster activities to mitigate damage by actors such as national and local governments, relevant agencies and residents, are critical. Consequently, the national government shall develop an outline of “measures for earthquake disasters” as a master plan to cope with catastrophic earthquakes, including measures to take during the stages of pre-disaster, emergency response, and rehabilitation and reconstruction. To measure the impact of this mitigation effort, the national government shall set goals that can be measured quantitatively over time. Monitoring achievements of these efforts shall be done periodically. Since local government participation and coordination with the national government are essential to achieve the aim, relevant local governments need to take responsibility for developing local goals that align with national disaster management strategies.

5.1.1 Roles and Responsibilities

The federal government’s roles and responsibilities in pre-disaster, emergency response and post-disaster periods are shown in the tables below:

Table 5.1 Role and Responsibility in Pre-disaster (Earthquake)

Activity	Agency	1. Developing a County and Cities Safer from Earthquake Disaster																	2. Promoting Citizen's Participation in Disaster Mitigation and Preparedness Activities																	3. Preparedness for Prompt and Effective Emergency Response and Rehabilitation and Reconstruction																	4. Promotion of Researches and Observations																																																																																																																																																																																																																										
		Basic concept of securing Resistance on Civil Structures, Building Facilities, and Other Structures																	Developing a Country Safe for Disaster																	Collecting Information and Correspondences																	Establishing Emergency Response System																	Promoting Culture of Disaster Management																	Disseminating Disaster Management Knowledge and Trainings																	Improving the Environment of Citizen's Participation in Disaster Prevention Activities																	Activities on Emergency Transportation																	Activities on Evacuation and Accommodations																	Activities on Procurement and Supply of Food, Water and Daily Commodities																	Temporary Recovery Activities on Buildings and Utilities																	Activities on Preventing Secondary Disasters																	Activities on Accepting Foreign Assistance																	Implementing Disaster Management Drills by the Relevant Agencies of Disaster Management																	Preparing for Disaster Rehabilitation and Reconstruction																	Promoting Researchers and Observations on Earthquake and Tsunami Disasters and its Management soon after Occurrence														
		1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	3.11	3.12	4.1	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	3.11	3.12	4.1	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	3.11	3.12	4.1	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	3.11	3.12	4.1																																																																																																																																																																																																		
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Legend: ● Main Responsible ○ Responsible △ Supporting

Table 5.3 Role and Responsibility in Post-Disaster (Earthquake)

Activity	1. Deciding Fundamental Orientation of Rehabilitation and Reconstruction		2. Procedures on Prompt Rehabilitation to Pre-disaster Condition		3. Procedures on Planned Reconstruction		4. Assisting Livelihood Restoration of Disaster Victims		5. Assisting Reconstruction of Small and Medium-sized Enterprises and Economic Recovery	
	Agency	Activity	Agency	Activity	Agency	Activity	Agency	Activity	Agency	Activity
Federal DM Coordinating Body:										
NDMA	●	●	○	○	○	○	○	○	○	○
Federal DM Ministries:										
Cabinet Secretariat	○	○	○	○	○	○	○	○	○	○
Ministry of Communications	○	○	○	○	○	○	○	○	○	○
Ministry of Defence	○	○	○	○	○	○	○	○	○	○
Ministry of Disaster Management	●	●	○	○	○	○	○	○	○	○
Ministry of Economic Affairs and Statistics	○	○	○	○	○	○	○	○	○	○
Ministry of Finance ,Revenue , Planing and Development	○	○	○	○	○	○	○	○	○	○
Ministry of Food security and Research	○	○	○	○	○	○	○	○	○	○
Ministry of Regulation and Services	○	○	○	○	○	○	○	○	○	○
Ministry of Foreign Affairs	○	○	○	○	○	○	○	○	○	○
Ministry of Hunman Rights	○	○	○	○	○	○	○	○	○	○
Ministry of Housing and Works	○	○	○	○	○	○	○	○	○	○
Ministry of Industries	○	○	●	○	○	○	○	○	○	○
Ministry of Information and Broadcasting	○	○	○	○	○	○	○	○	○	○
Ministry of Information Technology	○	○	○	○	○	○	○	○	○	○
Ministry of Interior	○	○	○	○	○	○	○	○	○	○
Ministry of Law ,Justice and Parliamentary Affairs	○	○	○	○	○	○	○	○	○	○
Ministry of Petroleum and Natural Resources	○	○	○	○	○	○	○	○	○	○
Ministry of Ports and Shipping	○	○	○	○	○	○	○	○	○	○
Ministry of Railways	○	○	○	○	○	○	○	○	○	○
Ministry of Science and Technology	○	○	○	○	○	○	○	○	○	○
Ministry of Water and Power	○	○	○	○	○	○	○	○	○	○
Federal DM Departments and Authorities										
Capital Development Authority	○	○	○	○	○	○	○	○	○	○
Civil Aviation Authority	○	○	○	○	○	○	○	○	○	○
Civil Defence	○	○	○	○	○	○	○	○	○	○
Coast Guards	○	○	○	○	○	○	○	○	○	○
Earthquake Reconstruction and Rehabilitation Authority	●	●	●	●	●	●	●	●	●	●
Emergency Relief Cell (ERC)	○	○	○	○	○	○	○	○	○	○
Fire Services	○	○	○	○	○	○	○	○	○	○
Geological Survey of Pakistan	○	○	○	○	○	○	○	○	○	○
Indus River System Authority (IRSA)	○	○	○	○	○	○	○	○	○	○
National Crisis Management Cell (NCMC)	○	○	○	○	○	○	○	○	○	○
National Database and Registration Authority (NADRA)	○	○	○	○	○	○	○	○	○	○
National Highway Authority	○	○	○	○	○	○	○	○	○	○
National Housing Authority	○	○	○	○	○	○	○	○	○	○
National Logistics Cell (NLC)	○	○	○	○	○	○	○	○	○	○
Pakistan Armed Forces	○	○	○	○	○	○	○	○	○	○
Pakistan Commissioner for Indus Waters (PCIW)	○	○	○	○	○	○	○	○	○	○
Pakistan Housing Authority	○	○	○	○	○	○	○	○	○	○
Pakistan Meteorological Department	○	○	○	○	○	○	○	○	○	○
Pakistan Public Works Department	○	○	○	○	○	○	○	○	○	○
Pakistan Railways	○	○	○	○	○	○	○	○	○	○
Planning Commission	○	○	○	○	○	○	○	○	○	○
Police (Other Law Enforcemnet Agencies)	○	○	○	○	○	○	○	○	○	○
Space and Upper Atmosphere Research Commission (SUPARCO)	○	○	○	○	○	○	○	○	○	○
Survey of Pakistan	○	○	○	○	○	○	○	○	○	○
Traffic Police	○	○	○	○	○	○	○	○	○	○
Water and Power Development Authority(WAPDA)	○	○	○	○	○	○	○	○	○	○
Federal DM Public Companies and Stakeholders										
Airline Companies	○	○	○	○	○	○	○	○	○	○
Banks	○	○	○	○	○	○	○	○	○	○
Ambulance Services	○	○	○	○	○	○	○	○	○	○
Hospitals	○	○	○	○	○	○	○	○	○	○
Insurance Sector	○	○	○	○	○	○	○	○	○	○
Landline Telecommunications Companies (NTC, PTCL)	○	○	○	○	○	○	○	○	○	○
Media	○	○	○	○	○	○	○	○	○	○
Mobile Telecommunications Companies	○	○	○	○	○	○	○	○	○	○
Pakistan Humanitarian Forum	○	○	○	○	○	○	○	○	○	○
Pakistan Red Crescent Society	○	○	○	○	○	○	○	○	○	○
Sui Northern Gas Pipelines Limited (SNGPL)	○	○	○	○	○	○	○	○	○	○
Sui Southern Gas Pipelines Limited (SSGPL)	○	○	○	○	○	○	○	○	○	○
International DM Supporting Organizations										
UN Agencies and Donors	○	△	△	△	△	△	△	△	△	△
IFRC	○	△	△	△	△	△	△	△	△	△
International NGOs	○	△	△	△	△	△	△	△	△	△
Local DM Governments:										
Province (P/R/SDMA)	●	●	●	●	●	●	●	●	●	●
District (DDMA)	●	●	●	●	●	●	●	●	●	●
Other DM Stakeholders										
Research Institutes/Universities	○	○	○	○	○	○	○	○	○	○
Companies	○	○	○	○	○	○	○	○	○	○
Communities	○	○	○	○	○	○	○	○	○	○
Domestic NGOs	○	○	○	○	○	○	○	○	○	○
Residents	○	○	○	○	○	○	○	○	○	○
Volunteers	○	○	○	○	○	○	○	○	○	○

Legend: ● Main Responsible ○ Responsible △ Supporting

Table 5.4 Role and Responsibility (Tsunami)

Activity	1. Pre-Disaster Measures		2. Emergency Response Measures	
	Agency	Activity	Agency	Activity
1. Pre-Disaster Measures				
1.1 Developing a Country and Cities Safe from Disasters	○	○	○	○
1.2 Preparing Prompt Actions and Distribution for Tsunami Warnings	○	○	○	○
1.3 Enlightenment of Citizens	○	○	○	○
2. Emergency Response Measures				
2.1 Measures just before Disaster Occurrence	○	○	○	○

5.2 Pre-Disaster Measures

5.2.1 Developing a Country and Cities Safe from Earthquake Disasters

1) Basic Concept for Securing Resistance on Civil Structures, Building Facilities, and Other Structures

Securing structure and infrastructure resistance to earthquake, buildings, civil structures, communication facilities, lifeline facilities, and disaster relevant facilities is critical to developing resilience to earthquakes for the country and its urban areas. Methods of design for earthquake-resistance may be different dependent on structural types and purpose of use; however, common items can be summarized as follows.

- In particular, design standards aim to secure structures and facilities from dysfunctions from general-sized earthquake motions, and save lives from collapse of these structures and facilities from higher-level earthquake motions.
- Structures and facilities that are critical for continuous operation during disasters, i.e., the ones that may hinder emergency activities by their functional failure, largely affect economic activities at both national and provincial levels, and buildings that are expected to promote life saving during emergency response shall need to set a priority and design with higher standards so that their damage from earthquakes shall be minimum.
- Securing resistance is not limited to the standardization of earthquake-resistant design as described above, but is also required to secure and develop contingency and alternative systems to avoid functional failure as a whole.

2) Developing a Country Safe from Disaster

a. Enhancing Major Transportation System and Communication Functions

- The Ministry of Communication, Ministry of Railway, Ministry of Ports and Shipping, and National Highway Authority shall aim to secure resistance of transportation and communication systems (i.e., railway, road, port, and airport) through measures such as applying earthquake resistant designs for individual facilities and enhancing its whole network.

b. Improving Capacity of Disaster Management in National Capital

- NDMA and Capital Development Authority (CDA) shall promote measures to develop urban structures resistant to disasters due to their important role in the nation. Further, decentralization of functions from Islamabad to other regions shall need to be discussed for Pakistan to be resilient to an earthquake disaster.

- CDA shall develop an operation continuity plan to be prepared for possible disruption and damage from an earthquake that the national capital may face. The continuity plan shall focus on operations related to emergency response and other operations that need to be continued in the aftermath of disaster. Further, responsible departments and agencies of the central government shall need to be prepared to take mandated roles upon an emergency.

3) Developing Cities Safe from Disaster

a. Developing Urban Areas Safe from Earthquakes

- NDMA, the Ministry of Housing and Works, and local governments shall promote urban structures resistant to earthquakes by introducing two strategies: one is to introduce urban infrastructures that have disaster management functions (e.g., evacuation route, evacuation land, fire-prevention belts, arterial roads, urban parks, rivers, ports and airports); the other is to introduce projects that are relevant to land use that reduce urban vulnerability (e.g., developing an area safe from disaster, land readjustments to reduce dense population concentrations, urban redevelopment programs, earthquake and fire-resistant promotion for buildings and public facilities, preserving water and open spaces through land use planning). All of these are achieved by guiding land use that is formulated on disaster management concepts.

b. Improving Security of Building Structures

- NDMA, the Ministry of Housing and Works, local governments, and the managing body of facilities/infrastructures are particularly responsible for preserving the earthquake-resistance of facilities that are used by large numbers of people (i.e., theatres, transportation hubs/stations) and that are critical during emergency response (i.e., schools and medical facilities). NDMA, the Ministry of Housing and Works, local governments, and the managing body of facilities/infrastructures are especially responsible for making an effort to promote public facilities that play an important role in emergency response to be earthquake-resistant.
- To promote resistance of buildings including residential buildings, national and local governments are responsible to guide relevant agencies/organizations to follow building codes and standards.
- The Ministry of Housing and Works is responsible for collecting and disclosing information related to earthquake resistance of buildings to show current conditions and mitigation efforts in the areas designated to promote disaster mitigation. Such information includes the list of public facilities with results of building diagnosis, the progress of diagnosis, and

building strengthening.

c. Securing Function of Lifelines and Other Facilities

- The Ministry of Water and Power, local government and rural development and lifeline corporations are responsible for promoting the earthquake resistance of lifeline facilities (i.e., water and sewage system, industrial water, electricity, gas, and phone) and waste disposal and treatment sites. Further, redundancy of these functions through strengthening the network, decentralizing hubs, and developing alternative facilities shall be promoted.
- In the course of preserving functions of lifeline facilities, damage and loss estimation of large-scaled earthquakes shall be calculated upon need. Improving resistance of major facilities, preparing a system for rehabilitation in earthquake periods, and stockpiling needed equipment are required based on the results of damage estimation.

d. Measures on Steep Slopes and Liquefactions

- GSP and local governments shall identify steep slopes that may develop rock falls and other land failures due to earthquakes in order to: 1) designate hazardous steep slope areas of possible land failure, 2) promote programs to cope with land failure on steep slopes, and 3) relocate buildings that stand in the hazardous areas. Further, developing hazard maps and providing information on evacuation procedures to local residents shall also be implemented.
- National and local governments and management bodies of public facilities need to take measures to either prevent liquefaction or avoid damage of facilities by liquefaction when large-scale developments are constructed through coordination between these actors. Moreover, measures for liquefaction on small-scale construction, i.e., residential buildings, shall also be promoted through manuals that discuss foundations to make buildings resilient to liquefaction.

e. Securing Safety of Facilities handling Hazardous Material

- The Ministry of Industry and Production, Ministry of Petroleum and Natural Resources and local governments shall preserve resistance of facilities that treat hazardous materials (e.g., oil complexes, boiler facilities and chemicals facilities that might explode easily), and promote disaster management training.

f. Preparing Emergency Response System during Emergency

- The Ministry of Industry and Production, Ministry of Petroleum and Natural Resources, local governments and public agencies shall prepare for emergency response, disaster

rehabilitation and reconstruction, to respond speedily and smoothly in a case of an earthquake. Preparation includes capacity improvement of government officials and local residents on disaster management.

5.2.2 Promoting Citizen's Participation in Disaster Mitigation and Preparedness Activities

1) Promoting Culture of Disaster Management

Protecting our own safety is fundamental to disaster management. Citizens should be aware of this and prepare for earthquake and tsunami disasters in normal times, and take appropriate actions to ensure their own safety in the time of disaster. In addition, they are expected to contribute to disaster risk reduction activities including extinguishing fires in the early stage, supporting injured neighbors and the vulnerable population from natural disasters, taking their own actions at evacuation shelters and supporting activities that have been implemented by national and local governments, public agencies and NGOs. In order to achieve this goal, national and local governments and public agencies shall pursue the promotion of a culture of disaster prevention.

2) Disseminating Disaster Management Knowledge and Training

a. Disseminating Disaster Management Knowledge

- Taking advantage of Disaster Management Day (8th of October)/Week and relevant events, national and local governments and public agencies shall disseminate the information on disaster knowledge and risks to people. In particular, NDMA, F/G/S/PDMAs and DDMA should indicate contents of emergency bags for homes such as food for 2 or 3 days, bottles of mineral water, emergency goods (first-aid kit, torches, radio, batteries, etc.) and provide information on earthquake countermeasures to be taken at home, appropriate actions to be taken at the time of earthquakes under various situations (at home, outside, driving, etc.), what to do in evacuation shelters and others.
- NDMA, GSP, PMD, and SUPARCO must strive to develop public materials on earthquake activities, plate movements and active faults for people to obtain correct information regarding the natural condition of Pakistan.
- PMD and NDMA shall provide citizens scientific information on earthquakes (epicentre, magnitude, aftershocks, etc.) in an easy-to-understand manner.
- Local governments shall widely disseminate disaster-related information to residents, conduct disaster risk assessment in local areas, develop hazard maps with evacuation routes/sites and manuals for actions to be taken at the time of earthquakes, and implement training for residents.

- The Cabinet Secretariat shall promote disaster management education. The national and local governments should promote disaster management education in close cooperation with various actors in local communities.

b. Implementing and Training on Disaster Management Drills

- NDMA, F/G/S/PDMAs and DDMA shall conduct disaster management drills during the Disaster Risk Reduction Day/Week. NDMA shall conduct training of trainers (TOT) and local government officer (staff of DDMA and tehsils) training to learn risk reduction measures and evacuation behavior at the time of meteorological disasters including practical disaster management.
- F/G/S/PDMAs and DDMA shall conduct drills including emergency evacuation guidance and coordination with relevant organizations, under the assumption of a flood at underground facilities based on the training by NDMA.
- In conducting disaster management training, vulnerable groups of people such as the elderly, disabled, infants, and pregnant women shall be taken into careful consideration and need a local supporting system. In this context, all training and drills shall be coordinated with community-based activities.

c. Considering People Vulnerable to Natural Hazards in Disseminating Disaster Knowledge and Training

- In disseminating disaster knowledge and conducting training, the elderly, disabled, foreigners, infants, and pregnant women must be carefully taken into consideration and included into the local supporting system. In addition, different needs for men and women should be considered.

3) Improving the Environment of Citizen's Participation in Disaster Management Activities

a. Organizing and Developing Capacity of Community-based Organizations for Disaster Management

- NDMA and local governments shall encourage the establishment of community-based organizations for disaster management, which play crucial roles for local disaster management and develop facilities, equipment, and the capacities of members.
- Districts, tehsils, and union councils shall develop the community organizations for disaster management and strengthen their capacities for disaster risk reduction. Local governments need to identify the leaders of the organizations and provide them with adequate training. Women shall be also encouraged to participate in the organizations.

- NDMA, districts, tehsils, and union councils shall develop facilities for community-based organizations to strengthen their capacities for disaster risk reduction. To achieve this, local governments need to identify the leaders of the organizations and provide them with adequate training.
- NDMA shall take advantage of NIDM effectively as a training, education and research facility of disaster management.

b. Encouraging the Environment of Volunteer Activities for Disaster Risk Reduction

- Districts, tehsils, and union councils shall coordinate with volunteers for disaster risk reduction in the time of emergency, in close cooperation with volunteer organizations.
- In cooperation with the Pakistan Red Crescent Society and the Ministry of Youth Affairs, Civil Defence, and Pakistan Humanitarian Forum shall improve the environment for volunteer activities so that they can be conducted smoothly at the time of disaster. In doing so, issues like volunteer registration in normal times, training programs, a coordination system of volunteer activities at the time of disaster, and preparation for volunteer activities shall be resolved through the research of NDMA (NIDM).

c. Promoting Disaster Risk Reduction Activities by Corporations

- Private corporations shall strive to promote the improvement of disaster management systems, implementation of disaster management drills, retrofitting of office buildings, disaster recovery plans, and review of each plan. Private corporations shall recognize the role of corporations at the time of disaster (safety of lives, prevention of secondary disasters, continuation of business, contribution to and cooperation with local communities), and develop a Business Continuity Plan (BCP), which is important for operations in the time of disaster.
- Therefore, NDMA, F/G/S/PDMAs and DDMA shall provide the information on these efforts to corporations and prepare a good environment for promoting disaster management at the private sector level. Furthermore, NDMA, F/G/S/PDMAs and DDMA shall raise the awareness for disaster risk reduction for all staff members of companies, as well as promote corporation-led disaster risk reduction activities, giving awards and evaluating their disaster risk reduction activities.
- NDMA, F/G/S/PDMAs DDMA shall conduct training and drills to local community members on: 1) methods for information transmission including river floods, flash floods, drought, cyclones (high tides and storm surges) and other related meteorological disaster warnings, 2) evacuation sites and other important items needed to secure smooth and prompt

evacuation, and 3) the name and location of facilities that may need to secure facility user's smooth and prompt evacuation during meteorological disasters, in particular, buildings located in low-lying areas for floods or facilities used by elders, all of which are to be based on the regional disaster management plan developed by districts and governments.

5.2.3 Preparedness for Prompt and Effective Emergency Response and Rehabilitation and Reconstruction

1) Collecting Information and Correspondences

- PMD shall promote reinforcement of the system, facilities, and equipment for observing earthquakes and tsunamis. Also, PMD shall promote reinforcement of the system, facilities, and equipment to enable monitoring and observation of tsunamis affected by storms and other phenomenon.
- NDMA, F/G/S/PDMAs and DDMA shall need to put effort into establishing an information collection and correspondence system, including multiplexing routes of information transmission and clarifying responsibility and routes of information collection/exchange, to ensure prompt and reliable communication among provincial and district governments, the national government, and other relevant disaster management organizations.
- NDMA, F/G/S/PDMAs and DDMA shall promote development of a system for collecting information and correspondences within each organization and among organizations. The system shall be developed to correspond properly at all times.
- NDMA, F/G/S/PDMAs and DDMA shall need to put effort into introducing information technology (IT) into a system that collects information and transmit correspondences for prompt and accurate operation in disaster management activities.
- NDMA, F/G/S/PDMAs and DDMA shall need to put effort into establishing a common system of disaster information to enable sharing of information among related organizations.
- NDMA, F/G/S/PDMAs and DDMA shall collaborate with residents and put effort into developing an information transmission system to disseminate disaster information in a proper manner.
- For agile activities on information collection, NDMA, F/G/S/PDMAs and DDMA shall develop a system that enables using various means for information collection, e.g., aircraft, helicopters, patrol vessels, satellites and monitoring cameras to develop collection of graphical information.
- NDMA, F/G/S/PDMAs and DDMA shall promote development of an information collection and correspondence system by dispatching staff in disaster-affected areas due to the

importance of prompt and appropriate collection and correspondences on disaster information.

- NDMA, F/G/S/PDMAs and DDMA shall need to put effort into developing a system for collecting disaster related information from various sources, including private companies, mass media, citizens, etc. for disaster management.
- NDMA, PMD, the Ministry of Information & Broadcasting, and local governments shall promote the reinforcement of mass media, multiple radio transmissions and mobile communication lines in order to secure information transmission during an emergency.

2) Establishing Emergency Response System

a. Emergency Response System

- NDMA, F/G/S/PDMAs and DDMA shall strengthen the emergency response system based on the National Disaster Response Plan (NDRP) for prompt and effective emergency response activities.
- NDMA, F/G/S/PDMAs and DDMA as well as public agencies shall need to establish an Emergency Mobilization System, including mobilization criteria, means of communication, location mobilized staff, and methods of information gathering/transmission. Moreover, they shall need to put effort into implementing drills and training to enable them to implement emergency response measures in the time of disaster.
- NDMA, F/G/S/PDMAs and DDMA as well as public agencies shall formulate manuals showing emergency response activities of staff in disasters. They shall implement periodical drills and training to ensure procedures of emergency response, to familiarize usage of equipment/tools, and to coordinate among other staff and organizations.
- NDMA, F/G/S/PDMAs and DDMA shall need to put efforts into formulating a scheme of training courses to enhance the capacity of staff in disaster management.

b. Establishing Coordination among Relevant Agencies in Disaster Management

- Coordination systems among relevant organizations are important in the time of disaster. The national government, public agencies, and local governments shall enhance coordination of mutual assistance for emergency response activities.
- Pakistani National/Local Police and Armed Forces shall need to cooperate and implement emergency rescue activities to respond to disasters.
- Fire brigades (Rescue 1122), Civil Defence and local governments shall put efforts into developing a mutual assistance system of life saving activities. Also, they shall make efforts to establish an Interregional Emergency Rescue Unit.

- NDMA, F/G/S/PDMAs and DDMA need to put efforts into developing a mutual supporting system required for interregional evacuation.
- NDMA, F/G/S/PDMAs and DDMA shall need to put efforts into establishing an Emergency Response Base for operation and accommodation of police, fire brigade, armed forces, a heliport, and facilities for transporting goods, to enable smooth implementation of emergency response activities.
- Local governments, in coordination with departments and agencies related to social welfare, shall need to put efforts into developing a system supporting vulnerable groups in case of disaster, including formulating an evacuation assistance plan.

c. Establishment of F/G/S/PEOC and DEOC

- NDMA, F/G/S/PDMAs and DDMA, in close coordination with relevant agencies, shall establish F/G/S/PEOC and DEOC, which have functions of disaster management bases during the time of disaster, according to the National Disaster Response Plan, March 2010.

d. Securing and Enhancing Central Disaster Management Function by NDMA

- NDMA, F/G/S/PDMAs and DDMA shall need to put efforts into establishing NEOC, F/G/S/PEOC and DEOC to be able to respond promptly against disasters. NEOC, F/G/S/PEOC and DEOC shall be located in a secure place against disasters and play the central function for emergency response.
- Local governments shall need to put efforts into designating facilities for emergency response in the time of disaster.
- NDMA, F/G/S/PDMAs and DDMA as well as medical agencies dealing with urgent medical treatment shall need to put efforts into equipping alternative energy sources to be able to supply electricity during power failure.
- NDMA, F/G/S/PDMAs and DDMA shall consider disaster management coordination measures to be able to respond promptly against disasters.
- In response to disaster, local governments and relevant agencies shall consider preparing a stockpile and procurement system of food, water, and other necessary items.
- Rescue 1122 (fire brigades) and Civil Defence shall need to put efforts into developing base facilities for conducting emergency response activities.

e. Establishing Coordination of DRM Activities among Provinces, Districts and Pakistani Armed Forces

- Provincial governments and Pakistani Armed Forces shall need to put efforts into

enhancing coordination by sharing their own Disaster Management Plans to identify roles and functions of each organization. During disasters, they shall need to put effort into conducting mutual communication and information sharing, and enabling Pakistani Armed Forces to dispatch disaster relief activities along the same manner as the federal government.

- NDMA, provincial governments and Pakistani Armed Forces shall need to put efforts into preparing an emergency response plan, including the names of key personnel, communication and coordination methods.
- Provincial governments and Pakistani Armed Forces shall discuss sharing activities of emergency response (e.g., rescue, first aid, medical treatment, emergency transportation, etc.).

f. Activities to Prevent Disaster

- Public facility administrator(s) shall develop a system for emergency inspection and urgent recovery of facilities, and preserve necessary equipment and materials for disaster response and urgent recovery. The disaster management body of each local government shall develop a system for activities related to disaster fighting.
- In order to conduct smooth flood managing activities, NDMA, F/G/S/PDMAs and DDMA, in cooperation with FFC, shall take necessary measures to remove debris, materials, and obstacles that are illegally placed or encroached to secure river management activities.
- WAPDA, Pakistan Coast Guard and PID shall prepare a manual on proper operation of dams, barrages, weirs, water gates and other facilities.
- PMD, in collaboration with provincial governments, shall need to put effort into providing advice on the effective use of information regarding early warning to district governments.

3) Rescue/First Aid, Medical Treatment

- NDMA, F/G/S/PDMAs and DDMA shall collect information on damage and communicate with medical agencies regarding necessary rescue/first aid and medical treatment activities.
- NDMA, F/G/S/PDMAs and DDMA as well as medical agencies shall need to put effort into enhancing the system for collecting information on damage and emergency medical treatment conditions.
- F/G/S/PDMAs and DDMA shall need to put effort into preparing vehicles (e.g., rescue vehicles, ambulances, lighting vehicles) and rescue equipment needed for emergency response activities in collaboration with Rescue 1122 (fire brigades) and Civil Defence.

- The national government (Pakistani Armed Forces, National Police Bureau, Pakistan Navy) shall prepare equipment for search and rescue.
- F/G/S/PDMAs and DDMA in cooperation with Rescue 1122 (fire brigades) and Civil Defence shall form a rescue team with equipment to respond to disasters, while putting effort into developing technology under the guidance of NDMA.
- The national government (Health Division), Pakistan Red Crescent Society, and local governments shall need to put effort into storing medicines and medical equipment that may be needed for first aid activities. Further, an urgent medical aid system needs to be established to respond to disasters.
- Local governments shall prepare a communication system within medical agencies.
- NDMA, in collaboration with the Ministry of Health, shall promote: 1) identifying roles of medical facilities, 2) providing triage techniques (assigning priority to give medical treatment to patients, and 3) implementing research and education/training related to medical treatment on sickness and injury caused by disaster.

4) Activities on Emergency Transportation

- F/G/S/PDMAs and DDMA shall identify available transportation facilities (roads, seaports, and airports) for emergency transportation during the time of disaster. NDMA, F/G/S/PDMAs and DDMA shall need further coordination to establish an emergency transportation network.
- Through discussion with NDMA and F/G/S/PDMAs, the Pakistani Armed Forces, National Police Bureau and Pakistan Navy shall designate emergency heliport sites as emergency transportation facilities.
- NDMA, National Highway Authority (NHA) and local governments shall need to put effort into improving the safety of the emergency transportation network.

5) Activities on Evacuation and Accommodation

a. Preparation of Evacuation Sites with Appurtenant Needs

- DDMA with assistance from NDMA/F/G/S/PDMAs shall designate emergency evacuation sites, such as urban parks, community halls and schools. Information on evacuation sites shall be disseminated to residents by DDMA prior to disasters. Ventilation, sanitary and lighting systems of evacuation sites shall be regularly examined and maintained in good condition.
- DDMA shall need to put effort into developing necessary facilities at evacuation sites, such as water tanks, wells, temporary toilets, blankets and telecommunication equipment.

In addition, local government shall pay special attention to the people in vulnerable groups such as elderly, handicapped, infants and women in evacuation sites.

- F/G/S/PDMAs and DDMA shall need to put effort into preparing emergency stocks such as food, water, power generator, medicine, and blankets at designated evacuation sites or places nearby.
- DDMA shall need to put effort into distributing information on the operation and maintenance of evacuation sites to residents prior to disasters.

b. Temporary Shelters and Housing

- NDMA, F/G/S/PDMAs, DDMA and local governments shall collect information on availability of materials, equipment and land for construction of temporary shelters or tents. The land for construction of temporary shelters shall be safe against secondary disasters.
- DDMA shall need to put effort into collecting information on availability of public housing or temporary shelters needed for disaster victims at the time of disaster.

6) Activities on Procurement and Supply of Food, Water and Daily Commodities

- Local governments (F/G/S/PDMAs, DDMA and health divisions), by assuming damage from disasters, shall prepare stockpiling of food, medicines and other commodities that are needed after the disaster. Also, local governments shall need to put efforts into establishing a stockpiling centre taking into account the distance to evacuation centres in case of disaster.
- The national government (Social Welfare and Special Education Division, Health Division, Pakistan Public Works Department, Information & Broadcasting Division) shall develop stockpiling systems of food, medical goods, and other commodities necessary in case of disaster.
- NDMA, F/G/S/PDMAs and DDMA shall designate stockpiling centres close to transportation networks, in order to distribute necessary commodities in the time of emergency.

7) Temporary Recovery Activities on Building and Utilities

- Public agencies shall develop systems to assess damage of their facilities and recovery measures related to their responsibilities (WASH, telecommunication, electricity, oil (gas), etc.).
- Lifeline corporations shall prepare a recovery plan of facilities prior to disasters. They shall need to put efforts into developing mutual damage recovery systems.

8) Activities on Distributing Appropriate Information to Disaster Victims

- Local governments shall develop various measures of emergency communication systems in disasters, including fixed landlines, mobile phones, and so forth.
- NDMA, F/G/S/PDMAs and DDMA as well as public agencies need to put efforts into developing proper systems to communicate with various people, including: 1) people who need rescue, 2) people who are isolated in the disaster area, and, 3) people who have difficulties in obtaining information.
- NDMA shall need to put effort into defining roles and responsibilities of each government agency for distributing necessary information to disaster victims.
- NDMA, F/G/S/PDMAs and DDMA, in cooperation with broadcasting corporations, shall need to make efforts on disseminating necessary information regarding disasters and livelihood information to disaster victims when needed.
- Broadcasting and/or telecommunication corporations shall need to put efforts into developing systems for collecting and distributing information on disaster damage and for confirmation of the safety of people.
- NDMA, F/G/S/PDMAs and DDMA and other related local governments shall plan systems to respond to inquiries from residents.

9) Activities on Preventing Secondary Disasters

- NDMA and local governments will develop a secondary disaster prevention system to prevent further damage by aftershocks or strong rainfall, and promote necessary measures such as capacity building of disaster management through educating technical experts on speedy safety assessment of buildings, housing land and potential land collapse areas, and preliminary registration of experts for quick mobilization.
- Necessary materials and equipment will be stocked to prevent secondary disasters.
- Management bodies of hazardous material facilities, such as petroleum plants and chemical plants.
- Health epidemics arising from the primary disaster, e.g., skin disease, gastro-related diseases or epidemics should be included as secondary disasters.

10) Activities on Accepting Foreign Assistance

a. Preparation of the Roster of Volunteers

- NDMA, F/G/S/PDMAs and DDMA as well as relevant agencies shall prepare the rosters for volunteers and CBOs to support the assessment and rescue/relief activities in the

affected areas.

b. Preparation of the List of Relief Goods

- Local governments shall prepare a list of necessary relief goods and disclose its contents based on the assessment results in the past flood and sediment disasters prior to the occurrence of disasters.

c. Preparation of the List of Accepting Donations

- NDMA, F/G/S/PDMAs and DDMA shall prepare the list of donations to be accepted and the procedure for use of donations in advance.
- NDMA, in association with the Ministry of Foreign Affairs, shall make a plan for the distribution protocol of foreign donations.

11) Implementing Disaster Management Drills by the Relevant Agencies of Disaster Management

a. Implementation of Disaster Management Drills at National Level

- NDMA F/G/S/PDMAs and DDMA shall strengthen the cooperation with public agencies and actively implement disaster management drills.
- NDMA F/G/S/PDMAs and DDMA shall reinforce information collection and communication transmission systems, as well as implement practical disaster management drills including wide-area disaster response drills, which shall take place upon request from affected local governments to the national government, and exercises for setting up DEOC in an affected area.

b. Implementation of Disaster Management Drills at Local Level

- Local governments, public agencies and other relevant agencies shall conduct disaster management drills with national agencies such as the NDMA, National Police Bureau, and Pakistani Armed Forces, in close collaboration with supporting organizations for earthquake disaster management, CBOs for disaster management, the Information & Broadcasting Division, private enterprises, volunteer Organizations and local residents including those who are vulnerable to disasters.
- NDMA, F/G/S/PDMAs and DDMA, as well as the public agencies shall conduct practical drills, setting various conditions such as well-thought-out implementation time and damage due to meteorological disasters, also incorporating the contents that participants need to judge by themselves. After conducting the drills, the NDMA, PDMA, and DDMA shall evaluate the drills, bring out issues and improve their systems as needed.

12) Preparing for Disaster Rehabilitation and Reconstruction

- NDMA and F/G/S/PDMAs shall promote preparation of a practical manual of recovery and reconstruction from disasters that is useful for affected local governments to prepare a rehabilitation and Reconstruction Plan.
- F/G/S/PDMAs and DDMA shall prepare the rehabilitation and Reconstruction Plan(s) for earthquake disasters in the future.
- With the support of NDMA, F/G/S/PDMAs and DDMA, local governments shall collect and manage various data of cadastral and land use maps, locations of public and underground facilities, and other relevant information prior to disasters.
- Managing bodies of public civil facilities shall organize information such as structural drawings and ground foundation conditions of important facilities prior to disasters for prompt action of post-disaster reconstruction.
- The national government (Ministry of Interior and Ministry of Industries and Production) shall establish disaster-resilient information and communication systems prior to disasters to promote rehabilitation and reconstruction in a proper manner in case of disaster.
- NDMA and F/G/S/PDMAs shall prepare the guidelines and manuals for the establishment of disaster-resilient information and communication systems for all related governmental agencies with provision of sample(s) of SOPs.

5.2.4 Promoting Research and Observations

1) Promotion of Research and Observations on Earthquake and Tsunami Disasters and their Management

- PMD, as a consequence of disaster management, shall promote the field of science and technology as well as research related to earthquakes. Further, the national government shall underscore the coordination of both inter-research institutions (including foreign institutions), and research-administrative institutions to implement practical disaster management policies.
- PMD, Cabinet Secretariat, the Ministry of Science and Technology and GSP shall: 1) collect basic data relevant to earthquake disasters and their measures; 2) establish and enhance research facilities and equipment of different fields; 3) promote research on disaster management in research institutions and in universities; and 4) promote research and development related to earthquake disaster management technologies.

- NDMA, in careful coordination with relevant agencies, shall promote sharing data observed and results of research, promote research on monitoring (e.g., active faults), and enhance monitoring systems and functions.
- NDMA shall provide research results found by the research institutions to disaster management agencies of national and local governments to ensure that the outcomes (e.g., earthquake monitoring research) contribute to making the disaster management system more solid.
- The research area shall not be limited to natural sciences (as research on earthquake prediction) but shall proactively extend to applied sciences, including engineering (structural design for earthquakes and earthquake resistance) and social sciences (human activities and information distribution).

5.3 Emergency Response Measures

District governments have the primary responsibility for emergency response activities as the administrative bodies closest to citizens. Provincial governments shall deal with the activities that require extensive and comprehensive response. In case of large-scale disasters that exceed the capacity of local governments, the national government shall actively assist with the emergency response activities.

First actions, implemented by relevant disaster management agencies after occurrence of an earthquake, are to collect disaster information on damage size. Next actions are to arrange necessary frameworks based on the information and to conduct concrete actions, including rescue, first aid, medical treatment, and fire extinction. Moreover, the relevant agencies shall conduct evacuation measures and necessary livelihood support such as provision of food, water and other items. After handling the immediate crisis situation, they shall implement health and sanitation measures, maintenance of social order, temporary recovery of lifelines and other important buildings and facilities, information provision to disaster victims, and prevention of secondary disasters including sediment disasters, rain and storm disasters, and building collapse. In addition, smooth acceptance of large-scale physical support is important.

5.3.1 Securing Information Collection, Dissemination and Communication

In case of an earthquake occurrence, earthquake information including 1) earthquake intensity, epicentre, magnitude and aftershock conditions, 2) tsunami warnings, 3) damage information, and 4) information on emergency response activities implemented by relevant agencies, are critical for effective emergency response activities. Therefore, relevant agencies should promptly collect information and correspond depending on the scale of the earthquake and extent of damage. On this occasion, various kinds and amounts information including general information

should be transmitted and shared using an effective communication means/equipment and information system, in order to grasp damage size at an early stage.

1) Collecting Damage Information for Rapid Assessment and Correspondence

a. Corresponding Information on Earthquake and Damage

- In case of earthquake occurrence, PMD shall firstly disseminate earthquake information, tsunami warnings and other information to the Prime Minister's office, relevant departments and agencies (NDMA, Ministry of Interior, Pakistani Armed Forces, Emergency Relief Cell, and others), relevant provincial and district governments, and relevant designated public agencies.
- In case the size of the earthquake corresponded by PMD exceeds a specified scale, NDMA shall disseminate earthquake information and other information to the Prime Minister's office, departments and agencies relevant to emergency response.
- Provincial governments shall communicate earthquake information disseminated by PMD to district governments and relevant agencies.
- With the aim of reduction of damage by earthquakes, PMD shall need to announce a flash report of earthquakes and transmit it to PBC & PTV as well as put effort into providing it to the Prime Minister's office, relevant departments and agencies, and local governments. Also, PMD needs to put effort into widely providing the information to citizens in cooperation with mass media.
- NDMA, F/G/S/PDMAs and DDMA mass media and others need to put effort into disseminating the received flash report of earthquakes to residents over the regional communication network, radio communications for disaster management of district governments, and other information tools.

b. Activities to Promptly Collect Extent of Damage Information

- Just after disaster occurrence, NDMA, F/G/S/PDMAs and DDMA, as well as relevant agencies collect related information for estimating the extent of damage, which includes general damage information, extent of lifeline damage, and condition of injured persons who come to medical facilities.
- National and local governments shall collect information by visual inspection and/or photographing from aircraft, based on needs.
- The national government (NDMA, Ministry of Interior, Pakistani Armed Forces, Emergency Relief Cell, and others) and local governments shall grasp the extent of damage by

utilizing image information, based on needs.

- National governments and relevant agencies shall evaluate the extent of damage promptly utilizing geographic information systems, earthquake monitoring systems, and others.

c. Collecting/Corresponding Initial Damage Information just after Earthquake Occurrence

- District governments need to collect information on damage conditions of humans and buildings, occurrence conditions of disasters such as fires, tsunamis and sediment disasters, to correspond promptly with the provincial government about acquired information including general information on damage size. In case they cannot correspond with the provincial government due to communication disruption or other problems, they shall correspond with NDMA.
- Provincial governments collect information from district governments as well as relevant agencies, and gather necessary general information on damage size by themselves. The provincial government shall report this information to NDMA and correspond with relevant departments and agencies where necessary. Provincial police and armed forces shall also gather damage information and inform the Ministry of Interior/Pakistani Armed Forces.
- The Ministry of Interior, Pakistani Armed Forces, Emergency Relief Cell, designated public agencies and relevant agencies will correspond with NDMA about general information on damage size. Then, NDMA will quickly grasp the extent of damage and inform the Prime Minister's office and relevant agencies promptly.
- In case of occurrence of large-scale earthquake, relevant departments and agencies (NDMA, the Ministry of Interior, Pakistani Armed Forces, Emergency Relief Cell, etc.), private public agencies and others will promptly correspond with the Prime Minister's office about initial information on damage.
- In case of occurrence of a large-scale earthquake, an emergency team, organized by the top official of relevant departments and agencies, will consolidate the acquired information in the Prime Minister's office. In this case, damage conditions of provinces and districts shall be confirmed directly from NDMA, where necessary.

d. Collecting /Corresponding Information related to General Damage

- District governments will collect damage information and correspond with Pakistani Armed Forces, relevant departments and agencies, where necessary. Pakistani Armed Forces will correspond with the Prime Minister's office and NDMA. After establishment of NEOC, Pakistani Armed Forces shall correspond with the NEOC.

- Designated public agencies will collect damage information related to each service and correspond with the Prime Minister's office, NDMA, and relevant departments and agencies directly or through relevant designated government agencies. After establishment of NEOC, they shall correspond with the NEOC.
- Designated government agencies will collect damage information related to their activities and correspond with the Prime Minister's office, NDMA, and relevant departments and agencies, where necessary. After establishment of NEOC, they shall correspond with the NEOC.
- NDMA or NEOC will report on the collected damage information to the Prime Minister, where necessary.
- NDMA or NEOC will correspond with designated government agencies as well as designated public agencies to share collected damage information.

e. Corresponding Information on Emergency Response Activities

- District governments will correspond with the provincial government about information such as emergency response activities, establishment of an Emergency Operation Centre, and the necessity of support from the provincial government. The provincial government will correspond with district governments about information such as emergency response activities implemented by the provincial government.
- Provincial governments and public agencies can correspond at any time with NEOC through designated government agencies about information such as emergency response activities and establishment of NEOC. Designated government agencies will correspond with NEOC as well as provincial governments and public agencies, where necessary, about information such as emergency response activities implemented by the designated government agencies themselves.
- NDMA or NEOC will report on collected information on emergency response activities to the Prime Minister, where necessary.
- NEOC will correspond with designated government and public agencies, provincial governments and other relevant agencies, where necessary, about information on emergency response activities collected by third parties or coordinated by NEOC.
- Relevant agencies shall mutually and closely exchange information on emergency response activities, where necessary.

2) Securing Means of Communication

Just after disaster occurrence, communication means for correspondence of disaster information should be promptly secured. Consequently, the following items should be done based on needs:

- National and local governments as well as public agencies will confirm the functioning of information transmission means just after disaster occurrence, and allocate necessary staff to sites immediately to recover facilities in trouble.
- The national government (Ministry of Interior and Pakistani Armed Forces) and local governments as well as telecommunication corporations need to put effort into setting up lines for emergency information communication by utilizing mobile communication lines such as mobile and satellite phone systems.
- Telecommunication corporations will preferentially secure important communication among relevant disaster management agencies such as national and local governments in the time of disaster.
- NEOC will promptly collect and organize information on the damage status of communication systems and smoothly conduct adjustments to devote available communication systems to important communication in order to secure important communication lines during an emergency.

5.3.2 Securing Emergency Response Operation System

1) Establishing System of Local Governments for Actions

- National and local governments, promptly after occurrence of disaster, will take necessary actions as, 1) emergency gathering of staff, 2) secure information collection and transmission system, and 3) establishment of NEOC/F/G/S/PEOCs/DEOCs.
- Local governments need to put efforts into securing close coordination among designated governmental Organizations and public agencies.

2) Establishing Wide-Area Assistance System

- NEOC/F/G/S/PEOCs/DEOCs shall ask for support of other national and local governments, depending upon the scale of damage for the preparation and execution of rescue and relief activities in accordance with individual contingency plans and SOPs or equivalent documents prepared by related agencies and governments.

3) Preparation of System for Action of NDMA, F/G/S/PDMAs, DDMA, and Other Relevant Organizations

- When a large-scale earthquake occurs, NDMA shall establish NEOC and collect information, report to the Prime Minister, coordinate with other relevant ministries, and shall focus on total coordination for prompt initial responses of the national government.
- When disaster seems likely to occur or actually occurs, DDMA shall activate their DEOC and collect information, report to the DCO, coordinate with other relevant sections and agencies, and shall focus on total coordination for prompt initial responses within the district section and agencies. These actions shall be informed to their upper F/G/S/PDMAs.
- When disaster seems likely to occur or actually occurs beyond the area of the district government's jurisdiction or management capacity, F/G/S/PDMAs shall activate their F/G/S/PEOC and collect information, report to the minister and governor, coordinate with other relevant ministries/departments and agencies, and shall focus on total coordination for prompt initial responses within the provincial government. These actions shall be informed to NDMA even though the disaster is supposed to be managed by the provincial government.
- Promptly after occurrence of a disaster, governmental Organizations and public agencies shall activate their systems necessary to gather staff, collect and transmit information, and establish EOCs in accordance with their individual contingency plans, SOPs or equivalent documents prescribed in advance.
- Governmental Organizations and public agencies need to put efforts into securing close coordination among relevant Organizations, agencies, and national and local governments.
- If necessary, lifeline corporations shall need to put efforts into coordinating a wide-area assistance system for emergency recovery measures.

4) Holding Meetings of Correspondences among Departments and Agencies relevant to Disaster Management

- When a large-scale disaster occurs, if necessary, Meetings of Correspondences among ministries and agencies relevant to disaster management are to be held to coordinate emergency response measures at all levels (federal, provincial and district), and to confirm/share initial information on disasters and damage. These meetings shall be arranged by the NDMA, F/G/S/PDMAs and DDMA at all levels. The procedures shall be separately stated in SOPs or equivalent documents in detail.
- Ministry and agencies relevant to disaster management will grasp the existing condition of the disaster-affected area and will implement prompt and effective emergency response

measures. If necessary, an investigation team consisting of officials and experts will be dispatched to the sites.

5) Gathering Staff (teams) for Emergency and Holding Minister Councils

- When disaster occurs, DDMA will mobilize emergency staff (a team) to its DEOC and collect information to be able to implement initial response by district governments and agencies. These actions shall be informed to their upper PDMA.
- When disaster occurs beyond the area of district jurisdiction or management capacity of a district government, F/G/S/PDMAs shall mobilize emergency staff (a team) to F/G/S/PEOC, and collect information to be able to implement initial response by provincial governments and departments. These actions shall be informed to NDMA.
- When large-scale disaster occurs beyond the abilities of provincial governments, NDMA will mobilize emergency staff (a team) to NEOC and collect information to be able to implement initial response by the national government.
- If necessary, the Chairmen of NDMA, F/G/S/PDMAs and DDMA shall hold emergency meeting(s) with the related officers (ministers, DGs, etc.), to discuss response activities on basic policy on measures, response system, and other important topics at all levels.

6) Establishing NEOC and other Centres for Responding to Disaster Emergency

a. Establishing NEOC for Responding Emergent Disaster and System for Action

- When large-scale damage is confirmed through collected information, NDMA shall promptly establish NEOC (Level 2).
- When the establishment policy of NEOC (Level 2) is decided, NDMA shall start the necessary process promptly to establish NEOC (Level 2). Fundamentally, NEOC (Level 2) and its Secretariat are located in the NDMA building.
- Members of NEOC (Level 2) mainly consist of the director and deputies of NDMA and relevant ministries.
- To be able to implement emergency response measures precisely and promptly, the head of NEOC (Level 2) shall give necessary instructions to the heads of governmental Organizations, local governments, public agencies, and other relevant Organizations relevant to disaster management.

b. Establishing NEOC to Respond to Seriously Large Disasters and System for Action

- Based on information collection, if the scale of damage is confirmed as Level 3 of NDRP, NDMA shall establish NEOC (Level 3) by approval of the Chairman of NDMA.
- When the basic policy on establishment of NEOC (Level 3) is decided, NDMA shall follow the necessary procedure and establish NEOC (Level 3) promptly.
- To be able to implement emergency response measures precisely and promptly, the head of NEOC (Level 3) shall give necessary instructions to heads of governmental Organizations, local governments, public agencies, and other relevant Organizations relevant to disaster management.
- The Secretariat of NEOC (Level 3) shall empower the response system based on the scale of damage and formulate a task force team consisting of staff from NDMA and relevant ministries. The task force team shall coordinate comprehensively and operate activities by separating kinds of emergency response measures into groups.

c. Declaration of Emergency by NDMA, F/G/S/PDMAs and/or DDMA

- The declaration of emergency depends upon the nature and size of the disaster. The normal practice is that a district level emergency is declared by the district administration. In case the emergency is beyond the capacity of district management, the Chief Minister (provinces) with the approval of the Cabinet declares an emergency. A national level emergency is declared by the Prime Minister of Pakistan in the event of larger calamity.
- As for the criteria for declaring an area affected by disaster, NDMA, F/G/S/PDMAs, DDMA shall define it as has been done in the past for each disaster (disaster-wise criteria is recommended).

d. Collection and Dissemination of Information and Establishment of System

- As described above, NEOC/F/G/S/PEOCs/DEOCs shall collect information on the disaster, damage including scale(s), list(s) and amount(s) and inform the heads of governments (DCO, Minister(s)/Governor, Prime Minister), agencies concerned (police, fire brigades (Rescue 1122), Civil Defence, Irrigation Offices, Civil Works Office, health-related offices, public utility corporations, revenue offices, international cooperation agencies, NGOs, INGOs and the upper EOC(s)) over the media in collaboration with related agencies (such as PMD, FFC, PIDs, WAPDA, Ministries of Health). These information systems consisting of hard and software with human resources shall be prepared.

e. Holding of (Coordination) Meeting with Related and Concerned Agencies

- As prescribed above, NEOC/F/G/S/PEOCs/DEOCs shall hold and coordinate the meeting(s) at each level (federal, provincial, district levels respectively) with related and concerned agencies for the quick and prompt actions (evacuation, rescue, relief and response) and arrangement of their activities at appropriate intervals.

f. Arrangements and Preparations for Evacuation, Rescue and Relief Activities

- F/G/S/PEOCs/DEOCs shall arrange and prepare the activities and actions for evacuation, rescue and relief in collaboration with related agencies in advance of disaster(s).
- F/G/S/PEOCs/DEOCs shall arrange and prepare the evacuation site(s) in accordance with contingency plan(s), SOPs or equivalent documents prepared by each government and agency in advance.

g. Issuance of Alerts and Evacuation Orders

- NEOC/F/G/S/PEOCs/DEOCs shall inform the public and residential people who are likely to be affected by the disaster of the situation regarding the disaster source (such as the intensity of rainfall, location of cyclone, etc.), hazard and risk prediction(s)/forecast(s) with areas to be likely affected and support/assistance system by government(s) in real time in parallel with media and the original source (PMD, PIDs, etc.).
- Significant issuance (evacuation order or equivalent) shall be issued by heads of government, such as DCO or Prime Minister(s) of federal or provincial governments in accordance with their jurisdictions.

h. Conduct of Damage Assessment for Relief, Response and Rehabilitation

- NEOC/F/G/S/PEOCs/DEOCs shall determine status of the disaster-affected area, and to be able to implement emergency response measures promptly and precisely, if necessary, dispatch survey teams in order to coordinate comprehensively on emergency response measures implemented by governmental Organizations, local governments, and public agencies.
- NDMA, F/G/S/PDMAs and DDMA shall conduct the initial damage needs assessment immediately after the disaster not only for relief and rescue activities but also for rehabilitation and reconstruction. In this regard, DDMA shall utilize a uniformed damage assessment format, which NDMA, F/G/S/PDMAs and DDMA shall separately prepare and state, to execute objective validation for the comparison of the degree of damage between bilateral affected areas. This damage needs assessment shall be conducted and reviewed at suitable periodical intervals until the commencement of rehabilitation works.

i. Method of Gathering upon Catastrophic Earthquake in Urban Areas

- Designated staff from relevant departments, state ministries and ministerial level institutions shall mobilize promptly if an earthquake of more than MMI VII scale is observed in an urban area. At that time, if transportation is blocked and by foot is only the means of mobilization, a request to mobilize by helicopters owned by the Pakistani Armed Forces shall be made.
- When NEOC is established in the suburb area of Islamabad, in case of heavy damage to the function of the capital city, necessary personnel are to be mobilized by helicopters owned by the Pakistani Armed Forces.

5.3.3 Rescue/First Aid, Medical Treatment, and Fire Extinguishing Activities

1) Rescue/First Aid Activities

- Top priorities to protect lives and bodies from injuries are to provide: 1) rescue and first aid activities to the victims underneath the collapsed buildings, 2) medical treatment to the injured people, and 3) fire extinguishing activities to minimize fire spread.

a. Role of Residents and Community Organizations for Disaster Management

- Residents and community Organizations for disaster management shall voluntarily rescue and begin first aid activities while coordinating with individual agencies relevant to rescue and first aid.

b. Rescue/First Aid Activities by Affected Local Governments

- Affected local governments need to take rescue and first aid actions while attempting to collect damage and loss information at early stages; they shall then ask for support to NDMA for emergency response, e.g., NEOC and F/G/S/PEOC, and other unaffected local governments. Further, the affected local governments shall secure areas for emergency response actions and places to stay for the incoming agencies.

c. Rescue/First Aid Activities by Local Governments External to Affected Areas and National Agencies

- Local governments outside the affected areas will provide rescue/first aid activities promptly and smoothly based on requests and the pre-disaster cooperation agreement.
- NDMA and F/G/S/PDMAs will request/direct support of the Pakistani Armed Forces, National Police Bureau, Pakistan Navy, Rescue 1122, Civil Defence, and the Ministry of Health if needed.
- NDMA and F/G/S/PDMAs will orchestrate the entire coordination of agencies and

departments such as the Ministry of Health, Rescue 1122 and Pak-Army that will provide rescue and first aid activities upon needs or requests from relevant agencies. Such coordination will aid relief providers in acting promptly and smoothly.

- DDMA's in collaboration with the Revenues Office, the police and Civil Defence shall take action to support relief activities in wide areas, e.g., dispatching emergency relief troops over a wide area upon need.
- Pak-Army shall provide rescue and first aid activities upon needs or requests by NDMA, F/G/S/PDMA's or DDMA's.
- Pakistan Navy is responsible for rescue and medical aid on sea and is to support activities of affected local governments when available and needed, or based on a request from NDMA, F/G/S/PDMA's or DDMA's.
- Equipment and supplies needed for rescue and first aid activities will be supplied in principle by the institutions and agencies that will provide such activities.
- NDMA, F/G/S/PDMA's and DDMA's will secure equipment and supplies for rescue and first aid activities with support from the private sector, if needed, to provide efficient and smooth operation.

d. Procuring Equipment

- Equipment and supplies needed for rescue and first aid activities shall be supplied by the institutions and agencies that implement such activities.
- National and local governments shall secure equipment and supplies for rescue and first aid activities by requesting cooperation from the private sector, if needed, to provide efficient and smooth operation.

2) Medical Treatment Activities

a. Activities on Medical Treatment by Medical Agencies in Affected Area

- Affected local governments shall provide medical activities at public medical institutions within their jurisdiction, while requesting cooperation from private medical institutions in their area, upon need.
- The national government (Ministry of Health, Pakistani Armed Forces) and Pakistan Red Crescent Society shall provide medical activities at medical institutions in the affected areas, in facilities such as state hospitals and medical clinics, hospitals at state universities, armed forces hospitals, and hospitals operated by the Pakistan Red Crescent Society.
- Medical institutions in the affected areas shall be responsible for urgent recovery of

hospital buildings and medical equipment from damage, while requesting lifeline corporations, if needed, for such rehabilitation.

- Medical institutions in the affected region shall mutually share information with other institutions in the area to be able to respond to the possible increase in patients. Cooperation shall be requested with the utmost effort to other medical institutions, if support is needed.
- Medical institutions in the affected area shall need to put effort into dispatching medical aid teams, depending on the situation.
- F/G/S/PDMAs and DDMA shall comprehensively coordinate medical activities by arranging plans, such as a dispatching plan for medical aid teams, either on need or request by affected local governments.
- NEOC, F/G/S/PEOCs and DEOCs as well as medical institutions shall collect information on the number of patients and treatment conditions through the disaster and rescue-medical information system covering a wide area in a speedy manner in order to send needed assistance.

b. Dispatching Medical Teams Externally to Affected Area

- Affected local governments shall request medical aid teams through medical institutions and EOCs upon need.
- The Ministry of Health, Pakistan Red Crescent Society, DDMA outside affected areas, F/G/S/PDMAs and NDMA shall establish medical aid teams with needed medical doctors and further request these teams and teams from public and private medical institutions, upon need.
- Pakistani Armed Forces shall establish and dispatch medical aid teams upon request.
- Pakistani Armed Forces and the Ministry of Interior need to take supportive action to medical aid teams that are formed by the district government.
- Medical institutions that form medical aid teams need to put effort into reporting about the fact of formation to the EOCs.
- F/G/S/PDMAs with DDMA administrating areas affected by the disaster shall be responsible for coordinating medical aid teams within the area and neighboring provinces. Further, provincial governments are responsible for selecting locations for medical activity.
- EOCs shall comprehensively coordinate dispatching medical aid teams based on needs and requests from each Authority.

- Ministries, Departments and agencies related to emergency transportation (NHA), Pakistani National Armed Forces, National Police Bureau, Pakistan Navy, Rescue 1122 and Civil Defence shall put effort into securing emergency transportation with priority based on needs and requests from federal and provincial Ministries of Health, Pakistani Red Crescent, and other related local government agencies.

c. Medical Treatment outside Affected Areas

- Affected local governments shall request back up institutions for medical treatment over a wide area (i.e., Ministry of Health, Pakistan Red Crescent Society) to provide backup medical treatment at institutions outside the affected jurisdictions, if needed.
- Back up institutions for medical treatment over a wide area shall select target institutions for this purpose and report to EOCs upon need.
- EOCs shall comprehensively coordinate with back up institutions for medical treatment over a wide area, based on needs or requests from relevant agencies.
- Departments and agencies related to emergency transportation shall secure means and methods of transportation for the injured to back-up medical institutions based on needs and requests from local governments and institutions related to backup medical treatments over a wide area.

3) Fire Extinguishing Activities

a. Fire Extinguishing Activities

- Residents and community Organizations for disaster management shall need to use self-effort to extinguish fires and contribute to agencies related to fire extinguishing in the initial stage after a disaster.
- Affected local governments shall comprehensively recognize fire incidents within their jurisdictions and allocate important teams in a speedy manner. In particular, local governments shall set areas with priorities for fire extinguishing and take action promptly in a catastrophic earthquake.
- Fire services and Rescue 1122 shall extinguish fires on the sea and request help from local governments upon need.

b. Assistance by Local Organizations External to Affected Areas

- Unaffected local governments shall need to put effort into providing smooth support for fire extinguishing based on requests from the affected local governments or the agreement on mutual support.

- The Ministry of Interior and Pakistani Armed Forces shall provide support to fire extinguishing agencies outside of the affected area and comprehensively coordinate fire extinguishing activities, as needed.
- EOCs shall comprehensively arrange requests to other agencies based on needs or requests from the Ministry of Interior and Pakistani Armed Forces.

5.3.4 Securing Transportation Network and Function for Emergency Transportation Activities

1) Basic Strategy on Securing Transportation Network and Function for Emergency Transportation

a. Issues to Consider on Transport

The following items are to be particularly underscored during transporting activities:

- (1) Life security
- (2) Preventing secondary damage
- (3) Smooth implementation of damage response measures

b. Foreseeing Elements Needed for Transportation

First Step

- (1) Rescue/first aid activities, personnel for medical activities, personnel for life saving, including commodities are needed.
- (2) Personnel and equipment for minimizing the spread of damage from fire and water.
- (3) Personnel and equipment needed for initial response, including both national and local government officials related to disaster management, personnel related to information and telecommunication, electricity, gas, and water supply networks.
- (4) Injured victims to be transferred to backup institutions for medical treatment.
- (5) Personnel and equipment needed for urgent rehabilitation on transportation facilities for emergency transport, transportation nodes, and traffic control.

Second Step

- (1) Continuing activities triggered in the first step.
- (2) Commodities needed for life saving, e.g., food and water.
- (3) Transportation of injured and affected victims outside affected area.
- (4) Personnel and equipment needed for temporary recovery on transportation facilities.

Third Step

- (1) Continuing activities triggered in the second step.
- (2) Personnel and equipment needed for rehabilitation from damage.
- (3) Basic needs for living.

2) Securing Transportation Network and Function

- Traffic control, such as prohibiting public use of roads, shall immediately be enforced to secure traffic/transportation routes for emergency transportation, particularly at the initial stage after an earthquake. Consequently, personnel and equipment needed for urgent rehabilitation shall be provided based on priorities.

a. Coordination by EOCs

- Securing traffic is critical for successful operation for emergency response and requires comprehensive coordination. Consequently, EOCs shall comprehensively coordinate and plan traffic security, and ask relevant agencies to report and/or request necessary assistance.

b. Traffic Control

- Provincial/district police shall use information provided by police officers and related agencies on site, and use traffic monitoring equipment such as traffic monitoring cameras if possible, to know the damage/traffic conditions to identify roads that are possible to use.
- Provincial/district police shall enforce traffic control such as prohibiting public use of certain roads to secure emergency transport, soon after the incident. Traffic control shall be enforced over a wide area, in cooperation with neighboring provincial/district police forces, when public cars need to be controlled on roads during the emergency period. Further, actual traffic control may need to be enforced in cooperation with private security corporations through pre-disaster agreements for smooth implementation. Moreover, other traffic control equipment that is useful for securing emergency transportation network and function, e.g., information boards and traffic lights, shall be used.
- Provincial/district police shall immediately provide information to residents when traffic control is enforced.
- Provincial/district police shall be responsible for actions, such as removing vehicles and leading other vehicles by police car, to secure the emergency transportation network and function.

- The Ministry of Interior shall coordinate traffic control enforced by provincial/district police from a comprehensive view, while providing guidance if needed.
- Policing agencies, road management bodies and EOCs shall mutually correspond upon enforcing traffic control.
- EOCs shall be responsible for comprehensive coordination, such as taking the lead in requesting other agencies, based on needs or requests from the Ministry of Interior.

c. Urgent Rehabilitation of Roads

- The Ministry of Communication, National Highway Authority and National Police shall 1) promptly understand damage conditions of their roads (national roads), 2) remove obstacles and urgently rehabilitate national roads, 3) request information on damage conditions to road managing bodies, e.g., affected local government, and 4) request and order urgent rehabilitation. When so doing, urgent rehabilitation and selection of alternative roads shall be primarily followed by an establishment of an emergency transportation network. In addition, they are responsible for distributing traffic information to road users.
- Road managing bodies are responsible for understanding damage conditions of their roads promptly and reporting to the Ministry of Communications, National Highway Authority and National Police. They are also responsible for removing obstacles and urgently rehabilitating roads to secure their function.
- Road managing bodies, policing agencies, National Police, and Pakistani Armed Forces shall mutually coordinate to remove obstacles from roads, if the situation demands.
- The Ministry of Communications and National Highway Authority shall need to put effort into securing the needed number of personnel, equipment and construction materials to remove obstacles from roads and to urgently rehabilitate them with a cooperating agreement with contractors.
- The Pakistan Public Works Department shall report road damage conditions and rehabilitation status to EOCs.

d. Removing Obstacles in Sea Navigation

- The Coast Guard is responsible for understanding the degree of damage related to sea navigation immediately after an earthquake and reporting to EOCs if navigation of marine vessels is found to be unsafe due to wrecked ships or floating objects. Further, these departments are responsible for urgent rehabilitation activities, such as removing obstacles, transporting relocating residents, and transporting basic commodities needed

in emergencies.

- Port and fishing port administrative bodies shall report to EOCs and remove obstacles from their managing area, if marine vessel navigation is decided unsafe due to ship wreckage or floating objects.
- Pakistan Navy shall report to EOCs on the dangers of marine vessel navigation if ship wreckage or floating objects are found, and provide measures such as warnings on marine vessel navigation. Further, they shall give orders and warnings to the wrecked ship owners to remove the vessels in order to prevent other marine vessels from being involved in an accident.

e. Emergency Rehabilitation of Ports and Fishing Ports

- Port managing bodies shall collect damage information on port facilities in a speedy manner and report to the Ministry of Ports and Shipping. Further, these departments and port managing bodies shall provide urgent rehabilitation activities based on needs.
- Port managing bodies shall collect damage information on fishing port facilities in a speedy manner, urgently rehabilitate these facilities, and report damage status to the Ministry of Ports and Shipping and the Coast Guard.
- Pakistan Navy shall urgently rehabilitate navigation signs when found damaged or floating, and locate urgent navigation signs if needed.
- The Ministry of Ports and Shipping shall report to EOCs about damage conditions and the rehabilitation status of ports and fishing ports.

f. Re-establishing Sea Transportation System

- The Coast Guard shall control and lead traffic upon need in coastal areas, where congestion is expected. In this case, traffic control shall secure operation of marine vessels that are responsible for emergency transportation.
- The Coast Guard shall limit or prohibit marine vessel transportation when there are potential risks for continuous operation.
- The Coast Guard shall survey channels as needed when abnormality is found in their depth. Moreover, they shall secure safety of channels by installing emergency signs.

g. Emergency Rehabilitation of Facilities for Aviation

- The Civil Aviation Authority shall collect information on the extent of damage of facilities they manage and report to EOCs. At the same time, they shall urgently rehabilitate these facilities and request airport managing bodies to urgently rehabilitate these facilities.

- Airport managing bodies shall collect information on the degree of damage to their airport facilities, report to the Civil Aviation Authority, and urgently rehabilitate damaged facilities.
- The Civil Aviation Authority and EOCs shall closely and mutually correspond, and implement effective urgent rehabilitation.
- Local governments shall establish temporary heliports at the designated proposed sites and inform the public on the establishment.

h. Air Traffic Control

- The Civil Aviation Authority shall prioritize aircraft that shall respond to the emergency, such as those needed for information collection and emergency transportation. Further, these departments shall provide necessary information and control air traffic under abnormality to aircraft other than those responding to the emergency for safe operation.

i. Securing Railway Transportation

- The Ministry of Railways is responsible for promptly collecting information on railway damage, reporting to EOCs, and requesting urgent rehabilitation to railway corporations.
- The Pakistan Railway Corporation shall collect damage on railway facilities that are under their management, report to the Ministry of Railways, and conduct urgent rehabilitation.

j. Transporting in an Emergency

- Agencies related to emergency transportation and local governments shall comprehensively and proactively implement emergency transport by utilizing all means by land, sea and air. In particular, using both helicopters that have flexible mobility and sea vessels that have the capacity for mass transportation shall mainly be promoted for use in emergency.
- NEOC and F/G/S/PEOCs shall comprehensively coordinate and develop plans for an emergency transportation system, while requesting emergency transporting activities to departments and agencies related to emergency transport, based on needs or requests from affected local governments.
- NHA and provincial Ministries of Transport will request transportation corporations of air, road, sea, and railways for emergency transportation, based on needs or requests from Command Posts and affected local governments.
- Pakistan Navy shall contribute to emergency transportation by operating their vessels and aircraft based on needs and requests from EOCs and affected local governments.
- Pakistani Armed Forces, National Police Bureau, Pakistan Navy, Rescue 1122 and Civil

Defence will request emergency transport to agencies related to fire extinguishing based on needs and requests from Command Posts and affected local governments.

- Local governments shall implement emergency transportation by themselves, while requesting urgent transportation from agencies related to transportation and EOCs.

3) Securing Fuel

- Agencies related to emergency transportation and the Ministry of Water and Power shall plan and prepare fuel procuring and a supply system during the disaster.

5.3.5 Activities on Evacuation Centres

- Securing temporary residences until the time when the affected victims find safe places to live or until the time when their residences are rehabilitated will relieve the anxiety of disaster victims. Further, preparing measures to recover, such as providing temporary housing, is inevitable as a first step toward restoration of livelihoods of the affected victims.

1) Leading Evacuations

- After the occurrence of disaster, local governments shall lead evacuation of residents taking into account that securing lives of the residents is the first priority.
- When leading evacuation, local governments shall need to put effort into disseminating various information on evacuation sites, evacuation routes, high-risk areas from disasters, outline of damage and other related matters that help smooth evacuation.

2) Establishing/Managing Evacuation Sites

a. Establishing Evacuation Sites

- Local governments shall establish evacuation sites based on needs and disseminate this information thoroughly to the residents. If needed, local governments shall employ additional facilities as evacuation sites after confirming their safety from disaster under agreements with facility managing bodies, besides the ones that were originally designated. In addition, local governments shall need to put effort into establishing various evacuation sites, including facilities located outside of affected areas, by renting hotels and possible local accommodations to provide better care for vulnerable groups (e.g., elderly, handicapped, infants and pregnant women).

b. Managing Evacuation Sites

- DDMA will establish evacuation sites upon need by taking into consideration safety against floods, high tide/storm surges due to cyclones and sediment (landslide) disasters, while distributing such information thoroughly to residents in cooperation with

F/G/S/PDMAs. F/G/S/PDMAs and DDMAAs will also employ additional facilities as evacuation sites after confirming their safety from disaster under agreements with facility managing bodies, besides the ones that were originally designated. In addition, F/G/S/PDMAs and DDMAAs will need to put effort into establishing various evacuation sites, including facilities located outside of affected areas, by renting hotels and possible local accommodations, to provide better care for vulnerable groups (e.g., elderly, handicapped, infants and pregnant women).

- DDMAAs will properly manage each evacuation site. F/G/S/PDMAs and DDMAAs will need to put effort into distributing information, food, water and cleaning supplies, in cooperation with evacuees, residents and community disaster management Organizations. In light of this, DDMAAs will request cooperation from other local governments, NDMA and F/G/S/PDMAs, if needed.
- DDMAAs will need to put effort into collecting information on evacuees at each evacuation site as soon as possible and convey all information to NDMA and F/G/S/PDMAs.
- DDMAAs will need to put effort into paying attention to the living conditions at evacuation sites to keep the conditions comfortable. If the evacuation period is prolonged, DDMAAs will pay more attention to aspects such as keeping privacy and taking into account the various needs for people of different genders.
- DDMAAs will need to put effort into closing evacuation sites at early stages to secure the healthy livelihoods of victims through providing different housing as temporary housing, available public housing and vacant homes in the private sector in collaboration with NDMA and F/G/S/PDMAs.

3) Temporary Shelters and Other Housing

a. Providing Temporary Shelters by Affected Provincial Government

- If construction of temporary housing is needed after the disaster, DDMAAs and F/G/S/PDMAs will construct temporary housing based on a discussion with relevant provincial agencies (e.g., Ministries of Public Health, Social Welfare, Rehabilitation, Civil Defence, etc.) with NDMA in a speedy manner, to secure the healthy livelihood of evacuees. However, secondary disasters should be averted upon construction of such housing. DDMAAs and F/G/S/PDMAs will also administer the relocation of disaster victims to temporary housing while promoting its smooth operation in association with NDMA.

b. Procuring Equipment needed for Constructing Temporary Shelters

- DDMAAs and F/G/S/PDMAs of affected district and provincial governments will request procurement of needed construction materials and equipment for temporary housing to

relevant ministries and departments that have such materials (e.g., Ministries of Irrigation, Transport, and other ministries related to public works in collaboration with Civil Defence) as well as the federal government through NDMA when the damage is large-scaled and beyond their capacities.

- DDMA and F/G/S/PDMAs will request relevant provincial agencies and NDMA will request federal agencies to procure materials and equipment, if needed.
- Federal and provincial agencies that receive requests will decide on measures to take and respond to NDMA and affected F/G/S/PDMAs and DDMA.
- Based on the decision of agencies of which measures should be taken, the relevant agencies will distribute materials and equipment in response to requests.

c. Accommodating Wide-Area Evacuation

- Depending on the situation of evacuation and acceptance of disaster victims, affected DDMA and F/G/S/PDMAs will request cooperation for wide-area evacuation cooperation via NDMA to relevant federal departments and agencies (e.g., Pakistani Armed Forces, National Police Bureau, Pakistan Navy, and the Ministry of Health).
- NDMA (NEOC) will prepare a wide-area evacuation plan considering comprehensive viewpoints. Contents of the plan will be presented and instructed to DDMA and F/G/S/PDMAs with related departments and agencies taking necessary measures for preparation of wide-area evacuation.
- F/G/S/PDMAs and DDMA will properly implement all evacuation activities based on the plan in collaboration with related departments and agencies in accordance with the directions of NDMA

4) Caring for Population of Vulnerable Groups

- It is inevitable that F/G/S/PDMAs and DDMA in collaboration with health-related agencies shall take full care of afflicted people who are vulnerable, e.g., elderly, handicapped, infants and pregnant women, upon leading the evacuation, providing acceptable living conditions at evacuation sites, and ensuring acceptance to temporary housing. Consequently, particular effort will be made on items such as health checks at evacuation sites, priority accommodation to temporary housing, and temporary housing construction for the elderly and handicapped. Further, information will need to be distributed in a particular manner to those who are vulnerable.

5.3.6 Activities on Provision of Food, Water and Daily Commodities

- Relevant agencies shall operate, procure, keep, supply and distribute food, water, blankets and goods inevitably needed for daily life in order to maintain the disaster victims' health, in accordance with the policies described as follows:

1) Coordination by NEOC

- NEOC, in addition to procurement, comprehensive coordination, and planning, shall require relevant agencies to provide goods when it is considered necessary and/or requested by local governments of affected areas.

2) Providing Commodities by Local Governments

- DDMA and F/G/S/PDMAs of affected areas will promptly provide goods procured by them and goods handed over by federal governments (NDMA, etc.) and other local governments to disaster victims.
- DDMA and F/G/S/PDMAs of affected areas and each relevant federal government agency will be required to provide goods to NDMA, who is responsible for the coordination of procurement of goods if necessary.

3) Activities of Relevant National Government Agencies Responsible for Providing Goods

- NDMA, F/G/S/PDMAs and DDMA will make a request to relevant water supply corporations and ensure the supply of water to affected areas.
- Federal and provincial Ministries of Health, if considered necessary, or based on the request of NDMA or F/G/S/PDMAs of affected areas, will ensure the supply of medical goods to affected areas, with the cooperation of relevant Organizations or related business circles.
- The federal Ministry of Social Welfare and Special Education and provincial Ministries of Social Affairs, if considered necessary, or based on the request of NDMA or F/G/S/PDMAs of affected areas, will ensure the supply of food obtained by the related governments as well as with the cooperation of relevant Organizations or related business circles, to affected areas.
- The federal Ministry of Social Welfare and Special Education and provincial Ministries of Social Affairs, if considered necessary, or based on the request of NDMA or F/G/S/PDMAs of affected areas, will ensure the supply of essential commodities for living to affected areas in cooperation with relevant Organizations or related business circles.
- The federal Ministry of Communications and provincial Ministries for Information Technology, if considered necessary, or based on the request of NDMA or F/G/S/PDMAs of affected areas,

will ensure the supply of communication equipment in cooperation with relevant Organizations or related business circles.

- F/G/S/PDMAs and provincial Ministries of Transport in association with NDMA and the Ministry of Communications (NHA) will ensure the priority usage of transportation means for transport of such goods to affected areas.

5.3.7 Activities on Sanitation, Health, Epidemic Prevention, Treatment of Human Remains

- Activities for maintaining good health conditions of disaster victims at the affected area shall be well considered. In particular, much attention shall be given to the sanitary conditions of evacuation centres. In case of human loss and injury caused by a big disaster, treatment of human remains shall be done promptly without any delay.

1) Sanitation

- In order to maintain sanitary conditions and ensure a good living environment at evacuation centres and damaged areas, local governments, in cooperation with the Ministry of Health, shall promptly provide temporary toilets as required and take measures for cleaning the centres and providing treatment of human and domestic waste.

2) Public Health

- District and provincial health authorities shall operationalize and manage the District Health Information System (DHIS), which is the agreed model for health information systems in the country, in order to identify needs and gaps in the affected areas.
- There should be a separate Health Emergency Management Information System at the district and provincial levels (with information flow from the district to the province to the centre) that has various types of information related to stockpiles, trained personnel, volunteer database, mapping of NGOs, and other information relevant for use in an emergency.
- Based on information gathered from information systems, district and provincial health authorities shall draw up 'service rationalization plans,' which lay out what services are to be delivered where and to whom in the aftermath of the disaster. Health services can be rationalized according to the 'Essential package of health services' as defined by the National Health Policy 2010.
- District and provincial health authorities shall also develop 'staff retention strategies' in the event of a disaster, with a particular focus on female health workers, to ensure the capacity to meet the health needs of the affected areas. The retention strategies should be based on

performance, merit and market rates and should aim to retain/promote services in underserved and remote areas.

- District health authorities shall ascertain and define what medical supplies, diagnostics and equipment are needed per level of service, taking into account the catchment population and level of utilization. This information should then flow to the provincial and federal health authorities for planning purposes.
- District authorities shall ensure that special attention is given to comprehensive sexual and reproductive health services, including GB-related services and obstetric and gynecological care.
- The establishment of a district monitoring and evaluation unit shall be encouraged by district and provincial health authorities to ensure implementation of comprehensive health care service delivery at the district level.

3) Psycho-Social Aspects

- The provincial Ministry/Department of Health and DDMA's and F/G/S/PDMA's will continuously need to put effort into maintaining good health conditions of people in the affected areas, especially for evacuation centres, since disaster victims will have a high possibility of strained mental health due to drastic changes in their daily life and environment. Mental health conditions of victims will be evaluated and relief centres will be provided according to the needs.
- Mental health conditions of elderly and disabled people who need extra care should be especially taken into consideration. Hospitalization of such victims into welfare facilities, dispatching caregivers, and providing wheelchairs will be conducted in an orderly manner according to plans in cooperation with welfare service corporations and volunteer Organizations.

4) Epidemic Prevention

- District and provincial health authorities shall ensure that surveillance of epidemic prone diseases is continued and a comprehensive database shall be maintained to monitor the situation.

5) Treatment of Human Remains

- Regarding the treatment of human remains, DDMA's and national and local Police Bureau/offices will promptly conduct "Disaster Victim Identification." DDMA's, in coordination with the Ministry of Religious Affairs, will collect information on crematories and coffins available over broad areas, and arrange for the provision of coffins and transport of the dead. If deemed necessary, the local government (DDMA's and Revenue Offices) will conduct

cremation and/or burial over broad areas in cooperation with neighboring local governments. Sanitary conditions for the dead will be considered.

5.3.8 Activities on Safety Control, and Stabilization of Commodities Price

- Maintaining social order is one of the most important tasks; since it is considered that social chaos and psychological commotion often occur in affected areas. Also, relevant agencies and Organizations need to take appropriate measures to stabilize goods prices and the supply of necessary goods for reconstruction of disaster victims' lives.

1) Safety Control

- Local police officers under direction and with cooperation of the National Police Bureau, or in cooperation with anticrime voluntary Organizations, will conduct patrols in the affected areas and vicinities including coastal areas, provide information regarding safety for life, and promptly make efforts to ensure safety.
- Pakistan Navy and Army will deploy patrol boats offshore of the affected areas and promptly make efforts to ensure safety.

2) Stabilize Commodity Prices and Commodity Supplies

- Federal governments (the Ministry of Economic Affairs & Statistics) and local governments will watch the situation and prevent the steep rise of prices, buy-up, and withholding of essential commodities of life.

5.3.9 Temporary Recovery Activities on Buildings, Utilities, and Others

- Recovery of facilities and lifeline infrastructure shall be promptly conducted. These include telecommunication systems and facilities for prompt and smooth emergency response, land conservation facilities for preventing secondary disasters, and those for life activities of disaster victims.

1) Emergency Recovery Activities of Facilities and Utilities

- NEOC and F/G/S/PEOCs and DEOCs, immediately after the occurrences of disasters, utilizing specialists having relevant expertise, shall promptly check facilities and utilities under each authority's management and control, figure out the extent of damage and make efforts for prompt and smooth recovery of those facilities and lifeline infrastructure by preventing secondary disasters, as well as ensuring life activities of disaster victims as the top priority.

2) NEOCs' Roles Regarding Lifeline Facilities

- NEOC, F/G/S/PEOCs and DEOCs will request emergency response support to lifeline corporations through relevant government agencies such as the Ministry of Communication,

Ministry of Information & Broadcasting, Ministry of Housing & Works, Ministry of Petroleum & Natural Resources and Ministry of Water & Power, if deemed especially necessary, considering the magnitude of the disaster and the importance of facilities.

3) Activities on Emergency Response for Recovery of Housing

- F/G/S/PDMAs, DDMAAs and related departments in cooperation with housing corporations, if needed, will need to put efforts into emergency repair of damaged houses in accordance with related guidelines.

5.3.10 Activities on Distributing Appropriate Information to Disaster Victims

- It is important to disseminate appropriate, accurate and easily understandable information to people in the affected areas. This prevents social ferment caused by wild rumors, stabilizes public sentiment, and helps people's appropriate judgment and actions in the affected areas. Proper systems of disseminating information shall be developed to respond to inquiries, requirements, and opinions in large numbers given by residents.

1) Activities on Information Dissemination to Disaster Victims

- NEOC, responsible relevant government agencies, public agencies, as well as local governments, in responding to the needs of disaster victims, shall disseminate appropriate, accurate and sound information on (1) damage caused by the earthquake, (2) situation of aftershocks, (3) possibility of secondary disasters, (4) people's safety, (5) recovery situation of lifelines or transportation facilities, (6) life related information such as medical facilities, and (7) responding activities by each authority or Organization to the disaster victims for their use. On such occasion, the dissemination shall especially consider the elderly, disabled people and foreigners.
- NEOC, responsible relevant government agencies, public agencies, as well as local governments shall communicate among themselves on the information contents when they are released and disseminated to the public.
- Effort shall be required to provide a window, such as a portal site of the Internet, in order to enable people to get comprehensive information.
- Dissemination of information shall be done, not only with signboards, public relations brochures or magazines, or public relation cars, but also with the cooperation of mass media such as broadcasting corporations, telecommunication corporations, and newspaper corporations. In order to respond to the needs of people who require getting accurate information on somebody's safety, operation of transportation, and so on, an effort shall be needed to provide such information in cooperation with Internet portal providers. Also, the national government, in cooperation with broadcasting corporations, shall need to put efforts

into diffusing systems that automatically operate broadcasting of TV and radio during emergency occurrences.

- In addition, national and local governments, if deemed required, in cooperation with public agencies and relevant Organizations, shall set up a locally based “local information station” near the affected areas, which collect, manage, and disseminate all information over wide areas to relevant agencies and residents.

2) Disseminating Accurate Information to Residents

- NEOC, responsible relevant government agencies, public agencies, as well as local governments shall actively disseminate required information to the entire population of the nation regarding the damage caused by earthquakes, conditions of aftershocks, people’s safety, the recovery situation of transportation facilities, and handling of donated goods.
- NEOCs, responsible relevant government agencies, public agencies, as well as local governments shall exchange information with each other when they release and disseminate information to the public.
- At the dissemination of information, cooperation of broadcasting corporations, telecommunication corporations, newspaper corporations, and so on is to be extended. In order to respond to the needs of people who require getting information at any time on somebody’s safety, operation of transportation systems, etc., an effort shall need to be put on providing accurate information in cooperation with Internet portal providers.

3) Response to Inquiry of Residents

- NEOC, responsible relevant government agencies and local governments, if deemed necessary, shall need to put efforts on promptly providing an information Organization stationed with staff with telephone sets for the exclusive use of responding to inquiries by residents.

5.3.11 Activities on Preventing Secondary Disasters

- Measures to prevent secondary disasters, such as building and structure damage and flood and sediment disasters, from aftershocks or rainfall need to be developed. PMD shall need to put effort into collecting and distributing proper information on aftershock and rainfall conditions.

1) Measures for Flood and Sediment Disasters

- NDMA and local governments shall, by mobilizing experts, assess potential disaster areas for secondary flood and sediment disasters induced by aftershocks or rainfall. The areas assessed as high disaster potential areas shall be thoroughly informed to relevant agencies

and residents so that necessary measures, including removal of unstable soils, urgent construction of protection walls, and/or development of proper early warning and evacuation systems, can be taken. Further, these governments need to take proper evacuation measures if disasters of these kinds are expected to occur.

- PMD and provincial governments shall lower the criteria for warning systems to distribute rain, storm and sediment disaster warnings, if necessary.

2) Building Damage

- For building collapse induced by aftershocks, the Ministry of Housing and Works and local governments shall implement safety assessment promptly for both damaged buildings and residential lands by mobilizing construction engineers. Necessary measures shall be taken, e.g., urgently rehabilitating damaged facilities upon need or lead evacuation if continuous residence is deemed dangerous, based on the results of the assessment.

3) Measures for Cyclones and Storm Surges

- National and local governments shall check coastal protection facilities to prevent inundation from high waves, storm surges or changes in tidal levels. Urgent measures, including urgent recovery works as well as proper warning and evacuation systems shall be established, upon need. In cases where the potential for disaster occurrence is expected to be high, evacuation measures shall be implemented quickly.

4) Measures for Secondary Disasters by Explosive and Toxic Substances

- Managing bodies of hazardous facilities that may cause fire, such as petroleum and chemical plants, shall check the safety of their facilities and undertake necessary urgent recovery works to prevent secondary disasters like explosions. In case an explosion is highly expected, warnings shall be quickly delivered to relevant agencies.
- National and local governments as well as private corporations need to take measures such as facility inspections, urgent recovery works, information distribution to relevant agencies, and environmental monitoring, to protect leakage of toxic substances.

5.3.12 Accepting Support from Volunteers and Domestic/International Aid

- National and local governments shall appropriately respond to the offer of support from various domestic and international aid groups, which may increase upon release of disaster information to the media.

1) Accommodating Volunteers

- National and local governments as well as relevant agencies shall collaborate to assess the needs of affected areas and put efforts into securing a volunteer accommodation system,

including registration and coordination. Attention shall be paid to the effective use of volunteer's ability upon accommodation, for example to match up the ability of volunteers to the needs of victims (e.g., elderly care and foreigners), and to put effort into supporting volunteers to ensure their smooth implementation of volunteer activities by securing an activity base.

2) Accepting Donations from Citizens and Other Members of Society

a. Accepting Relief Goods

- Affected local governments shall decide and make a list of necessary and non-necessary relief goods donated by citizens and private corporations in cooperation with relevant agencies, and disclose the contents and addresses to send these goods to the citizens through NEOC and mass media. Based on the need conditions of the affected areas, the list of relief goods shall be updated. National and local governments outside the affected area shall need to establish inquiry counters for relief good donations and distribute information on the needs of the affected area if needed. Citizens and private corporations that are donating relief goods shall put effort into sending relief goods that are needed in the affected area, and send these relief goods in such a way that contents shall be indicated upon packaging to ensure smooth and quick classification and distribution.

b. Accepting Donations

- Local governments shall organizedonation accepting bodies and distribution committees. Use of donations shall be determined based on in-depth discussion by the relevant agencies.

3) Accepting Foreign Donations

- If foreign donations are offered through diplomatic routes, the Ministry of Foreign Affairs shall inform details on types of donation, volume, time and date of arrival and places to deliver the goods to NEOCs.
- NEOCs shall discuss the possibility of accepting donations.
- If accepting donations is determined to be feasible by NEOCs, a plan for acceptance of foreign donations shall be prepared based on the response strategy developed previously, and contents of the plan shall be disclosed to donor countries, relevant agencies and affected local governments. Based on the plan, relevant agencies shall start accepting foreign donations. Information shall also be distributed quickly to relevant foreign countries in cases where foreign donations are deemed not necessary.

5.4 Post-Disaster Measures

5.4.1 Post-Disaster Measures

- Rehabilitation and reconstruction of affected areas shall aim to meet basic conditions that shall promote regional development that is more resilient to disaster. This shall be achieved through supporting the restoration of livelihoods of the affected people and rehabilitating facilities with efforts on preventing future damage from disasters. Further, smooth and prompt implementation on rehabilitation and reconstruction is required because disasters often hamper the improvement of social and economic activities of the area.

5.4.2 Deciding Fundamental Orientation of Rehabilitation and Reconstruction

- Local governments shall promptly discuss and decide the basic orientation of rehabilitation and reconstruction, done in either speedy (in a short period aiming for efficiency) or thoughtful (in a mid-long period aiming for cities safe from disasters by planned recovery) ways by taking into account the damage conditions, regional characteristics, and the intentions of the relevant managing bodies of public facilities. If needed, a Reconstruction Plan shall be developed based on the decision.
- Rehabilitation and reconstruction of affected areas shall be led by local governments and shall reflect the resident's intentions for recovery through mutual interactions to develop a plan, while national governments shall support their activities.
- National governments shall provide financial support to local governments through fiscal, monetary, and local finance measures with appropriately distributed roles, because local governments shall need a large amount of money for urgent rehabilitation, reconstruction and recovery.
- Affected local governments shall request the national and other local governments to dispatch officers and other support to promote recovery and reconstruction if needed.

5.4.3 Procedures on Prompt Rehabilitation to Pre-disaster condition

1) Rehabilitating Damaged Facilities

- National and local governments as well as public agencies shall smoothly and promptly implement/support recovery projects of the affected facilities by utilizing pre-designated commodities, a plan for resources procurement, and a plan for collecting supportive human resources over a wide area.
- The national government shall need to put effort into simplifying the administrative procedures for implementing rehabilitation and recovery of lifeline facilities, as much as possible.

- National and local governments as well as public agencies shall need to put the utmost effort into improving the affected facilities to minimize future disaster damage in rehabilitation, although its primary aim is to restore the functions and conditions to the pre-disaster state.
- National and local governments shall provide the utmost effort on measures to minimize sediment disaster to avoid secondary disasters in areas where land has become unstable and thus has high hazard potential.
- Agencies and corporations related to lifelines and transportation shall need to put the utmost effort into publicizing the planned schedule of re-operation by area during the rehabilitation period.

2) Treatment of Debris

- Local governments shall establish: 1) methods for debris treatment processing, and 2) secure lands for temporary placement and final processing so that planned collection, transportation and final processing of debris shall be implemented smoothly and appropriately.
- The Ministry of Disaster Management and Ministry of Housing and Works shall provide needed support for prompt treatment of debris.
- Segregating debris appropriately for recycling is important in debris treatment.
- Debris shall be processed in a planned manner by taking into account rehabilitation and reconstruction. Further, appropriate measures for debris treatment shall be needed to prevent environmental degradation and to manage the health of both laborers in reconstruction and local residents.

5.4.4 Procedures on Planned Reconstruction

1) Formulating Reconstruction Plan

- A Reconstruction Plan shall be needed in places that are devastatingly damaged from catastrophes in all economic, social, and physical aspects. Reconstruction of such areas shall be large and involve a complex combination of projects, represented by restructuring of urban structure and industrial base by involving various stakeholders. Consequently, a Reconstruction Plan shall be developed to organize, coordinate and implement these reconstruction programs and projects as well as involving relevant agencies.
- Local governments shall organize system (i.e., coordination between local governments, the national government, and agencies designated in a wide-area cooperation agreement) to develop and implement the Reconstruction Plan promptly and smoothly. National governments shall also institutionalize reconstruction Organizations and support local governments, as needed.

2) Developing Cities Safe from Disasters

- Local governments shall aim to develop cities safe from disasters to minimize future disaster damage and to provide a better urban environment through securing the safety of citizens and environmental preservation. In this regard, the plan needs to envision the future of the city to prosper more, by taking into account the visions of both current and future residents. Additionally, citizens shall need to be involved this process.
- Local governments shall aim to improve the security of rivers from floods and safety from sediment disasters in the process of developing cities safe from disasters. In this regard, the purpose of securing open spaces, including urban parks and riversides, are not only limited to the use of evacuation and emergency transportation nodes as a consequence of disaster management, but also for betterment of regions, including environmental preservation, development of recreational areas, and betterment of landscape. Such aims and visions shall need to be shared with local residents for their understanding and support to make the plan work.
- Local governments shall promote demolishing existing substandard buildings from the viewpoint of disaster management and amenity, by explaining to the owners the importance of renewing such buildings by applying urban redevelopment programs.
- National and local governments, as well as public agencies, shall utilize pre-collected equipment and supplies, plan for equipment supply, and plan human resources for support in a wide area, for smooth and prompt rehabilitation of affected facilities and treatment of debris. Further, they shall implement these programs strategically by referring to the Reconstruction Plan, if needed.
- Local governments shall be responsible for presenting new city planning, procedures on making decisions on the plan, scheduling, and providing information on various options and policies for their selection to the affected residents.
- The Ministry of Health is responsible for providing measures to prevent degradation of health of people who shall work in the affected area, by providing training on safety and health and suggesting construction site patrols, for rehabilitation and reconstruction. Further, they shall establish counseling counters to prevent accidents at work and to take care of laborer's health management.

5.4.5 Assisting Livelihood Restoration of Disaster Victims

- The government may supply money for condolence and consolation, provide loans to support disaster-affected victims, and supply livelihood/welfare funds based on frameworks related to disaster condolence and provision. Further, the government shall support livelihood

restoration of victims by providing a fund for supporting livelihood restoration of disaster victims as designated in the law on supporting livelihood restoration of disaster victims, aiming for speedy recovery of the affected area. Consequently, the government shall establish a system of issuing certificates for disaster-affected persons soon after the disaster, to make the process and overall supporting measures function promptly.

- The local government needs to take necessary measures to secure jobs in the affected area and shall also provide detailed support, such as introducing work places, to the victims to enable them to maintain employment.
- The Ministry of Housing and Works and local governments shall promote victims having lands in hazardous areas to relocate to less hazardous areas.
- Local governments shall support disaster victims' living during the reconstruction period by providing measures such as temporary housing and tents.
- National and local governments shall publicize widely about information on support provided to disaster victims for their independence and acts on subsidies, while putting the utmost effort on establishing comprehensive consulting services, e.g., inquiry counters, for them. Further, national and local governments shall establish systems on public relations and correspondence to reach victims who are temporarily relocated long-distance, so that an equal amount of information can be secured to eliminate anxieties.
- Local governments, upon needs, shall discuss developing methods and measures to support disaster victims' finance and livelihood restoration, and to promote rehabilitation and reconstruction of the affected regions holistically and elastically, by introducing measures such as establishing recovery funds.

5.4.6 Assisting Reconstruction of Small and Medium-sized Enterprises and Economic Recovery

- Government related banks supporting small and medium-sized enterprises (SMEs) shall provide low-interest financing to the disaster affected SMEs to support their independent recovery, by utilizing loans such as disaster reconstruction loans to cover business operation and facility investments.
- The authority of cooperatives of small and medium enterprises as well as local governments shall provide loans as needed, so that SMEs will be able to rehabilitate equipment and facilities and operate businesses.
- National and local governments need to take measures on economic recovery to self-sustain at local levels through measures such as infrastructure improvement for regional

development. In this regard, strategies shall be developed to recover local industry and commerce by reflecting the national and local economy.

- Financial institutions related to farmers and anglers shall loan funds at a low-interest rate to enable them to rehabilitate facilities and equipment as well as stabilize their management.
- National and local governments shall publicize widely about information on support and special acts for SMEs, while putting the utmost effort into establishing comprehensive consulting services, e.g., inquiry counters, for them to use.

5.5 Tsunami Measures

5.5.1 Pre-Disaster Measures

1) Developing a Country and Cities Safe from Disasters

- The Ministry of Ports and Shipping and local governments shall develop/construct coastal protection facilities such as a coastal bank (tide embankment) and tidal gates, port facilities like breakwaters and facilities of fishery harbors, and river administration facilities such as river banks. They should also promote securing seismic resistance through seismic diagnosis and/or reinforcement of the facilities to retain the function of protection even after occurrence of an earthquake. In particular, they need to put effort into promoting automatic, remote operation of gates and land locks for prompt and assured closure of gates and land locks upon occurrence of an earthquake.
- National and local governments as well as relevant agencies shall give consideration to safety of structures and facilities against tsunami, in cases where structures and facilities are developed/constructed in tsunami hazard areas.
- National and local governments need to promote the development of evacuation sites and routes for tsunamis in tsunami hazard areas. In particular, in areas where highlands do not exist in the vicinity, construction and designation of tsunami evacuation buildings, which utilize middle and upper floors of solid high-rise buildings and/or artificial structures as evacuation sites, need to be promoted.
- National and local governments need to put effort into promoting the creation of tsunami-resistant areas by implementing measures to prevent detachment of the area, including development/construction of transportation infrastructure with high disaster prevention capacity against tsunami, heliports, disaster management facilities, and information infrastructure.
- The Ministry of Disaster Management and local governments shall carry out control of groundwater removal as a measure for land subsidence.

2) Preparing Prompt Actions and Distribution for Tsunami Warning

- PMD promotes reinforcing a system including earthquake and tsunami observation, analysis, and communication, as well as reinforcing facilities and equipment in order to conduct prompt tsunami warnings and other activities. Also, national and local governments need to put effort into reinforcing an information transmission system as well as facilities and equipment for communication, for prompt dissemination of tsunami warnings and other information.
- National and local governments need to put effort into collecting tsunami observation data at many points including offshore areas, sharing them among relevant agencies, and announcing this data to the public.

3) Enlightenment of Citizens

- Individual evacuation action is important, especially for tsunamis. Therefore, national and local governments shall widely enlighten residents, vessels' pilots and others about the danger of tsunamis, the meaning of tsunami warnings and evacuation directives, evacuation methods, and others.
- Local governments shall designate proper evacuation sites and routes, as well as keep everyone informed about them on a daily basis; for example, by installing easy-to-understand direction boards using unified symbols, etc. Further, for proper evacuation guidance of disaster vulnerable groups (i.e., elderly and the handicapped), local governments need to put effort into developing a system to guide them to evacuation areas in normal times, by cooperating with residents, community Organizations for disaster management, and other Organizations.
- Local governments shall predict the area to be inundated by tsunami beforehand, and prepare inundation area maps, and based on these maps, develop tsunami hazard maps to show evacuation sites and routes, etc. then, they shall inform residents about them. Also, the national government (NDMA and others) shall assist in the preparation of tsunami hazard maps in tsunami hazardous areas, the preparation of predicted inundation area maps and tsunami evacuation plans, as well as the promotion of popularization of a manual and/or guidelines for preparation of tsunami hazard maps.
- National and local governments shall actively implement tsunami disaster management drills.

5.5.2 Emergency Response Measures

1) Measures just prior to Pre-Disaster Occurrence

- PMD shall promptly evaluate the possibility of a tsunami after an earthquake occurrence and issue a tsunami warning. National and local governments, mass media and others shall disseminate tsunami warnings to residents, anglers, tourists, vessels and others promptly and accurately.
- Local governments shall lead residents to evacuate safely and effectively through prompt and proper evacuation instructions and directives, for example, by issuing evacuation directives immediately in cases where the necessity of evacuation is recognized when a large earthquake or prolonged slow shaking is felt, or in cases where tsunami warnings are perceived. On this occasion, they need to put effort into covering all the target people and disseminating information that is easy-to-understand for the entire population including vulnerable groups.
- Local governments shall implement emergency response activities such as mobilizing community Organizations for disaster management and other Organizations to close tidal gates as well as leading residents to evacuate to areas away from the seashore.

Chapter.6 Disaster Management Measures in Meteorological Hazards

6.1 Introduction

Pakistan is vulnerable to natural disaster risks from a range of hazards including floods (river flood, flash flood, coastal flood and other floods due to storms and cyclones), cyclones, droughts, earthquakes, glacial lake outbursts, landslides, avalanches and tsunamis with appurtenant secondary disasters, such as river erosion, water-borne diseases and epidemics after natural disasters and pest attacks. The most devastating example of human suffering and damage from disaster was the tremendous recent flood that inundated wide areas in Pakistan in 2010. That flood accounted for an estimated 2,000 deaths. In Pakistan, the effects of such damage by all kinds of natural disasters creates a vicious cycle in that they cause economic damage that sets back efforts to eradicate poverty, which in turn worsens poverty, making life more difficult for the remaining families. Consequently, the national government shall develop an outline of a Disaster Management Plan for Meteorological Disasters including measures to take during the stages of pre-disaster, emergency response, and post-disaster to alleviate all of the damage as well as risks and hazards.

6.1.1 Roles and Responsibilities

The federal government's roles and responsibilities in pre-disaster, emergency response and post-disaster periods are shown in the tables below:

Table 6.3 Role and Responsibility in Post-disaster (Meteorological Disaster)

Activity Agency	1. Deciding Fundamental Orientation of Rehabilitation and Reconstruction		2. Procedures on Prompt Rehabilitation to Pre-disaster Condition		3. Procedures on Planned Reconstruction		4. Assisting Livelihood Restoration of Disaster Victims		5. Assisting Reconstruction of Small and Medium-sized Enterprises and Economic Recovery	
Federal DM Coordinating Body:										
NDMA	●	●	○	○	○	○	○	○	○	○
Federal DM Ministries:										
Cabinet Secretariat	○	○	○	○	○	○	○	○	○	○
Ministry of Communications	○	○	○	○	○	○	○	○	○	○
Ministry of Defence	○	○	○	○	○	○	○	○	○	○
Ministry of Disaster Management	●	●	○	○	○	○	○	○	○	○
Ministry of Economic Affairs and Statistics	○	○	○	○	○	○	○	○	○	○
Ministry of Finance , Revenue, Planning and Development	○	○	○	○	○	○	○	○	○	○
Ministry of Food Security and Research	○	○	○	○	○	○	○	○	○	○
Ministry of Regulation and Service	○	○	○	○	○	○	○	○	○	○
Ministry of Foreign Affairs	○	○	○	○	○	○	○	○	○	○
Ministry of Human Rights	○	○	○	○	○	○	○	○	○	○
Ministry of Housing and Works	○	○	○	○	○	○	○	○	○	○
Ministry of Industries	○	○	●	○	○	○	○	○	○	○
Ministry of Information and Broadcasting	○	○	○	○	○	○	○	○	○	○
Ministry of Information Technology	○	○	○	○	○	○	○	○	○	○
Ministry of Interior	○	○	○	○	○	○	○	○	○	○
Ministry of Law, Justice and Parliamentary Affairs	○	○	○	○	○	○	○	○	○	○
Ministry of Petroleum and Natural Resources	○	○	○	○	○	○	○	○	○	○
Ministry of Ports and Shipping	○	○	○	○	○	○	○	○	○	○
Ministry of Railways	○	○	○	○	○	○	○	○	○	○
Ministry of Science and Technology	○	○	○	○	○	○	○	○	○	○
Ministry of Water and Power	○	○	○	○	○	○	○	○	○	○
Federal DM Departments and Authorities										
Capital Development Authority	○	○	○	○	○	○	○	○	○	○
Civil Aviation Authority	○	○	○	○	○	○	○	○	○	○
Civil Defence	○	○	○	○	○	○	○	○	○	○
Coast Guards	○	○	○	○	○	○	○	○	○	○
Emergency Relief Cell (ERC)	○	○	○	○	○	○	○	○	○	○
Federal Flood Commission	○	○	○	○	○	○	○	○	○	○
Fire Services	○	○	○	○	○	○	○	○	○	○
Geological Survey of Pakistan	○	○	○	○	○	○	○	○	○	○
Indus River System Authority (IRSA)	○	○	○	○	○	○	○	○	○	○
National Crisis Management Cell (NCMC)	○	○	○	○	○	○	○	○	○	○
National Database and Registration Authority (NADRA)	○	○	○	○	○	○	○	○	○	○
National Highway Authority	○	○	○	○	○	○	○	○	○	○
National Housing Authority	○	○	○	○	○	○	○	○	○	○
National Logistics Cell (NLC)	○	○	○	○	○	○	○	○	○	○
Pakistan Armed Forces	○	○	○	○	○	○	○	○	○	○
Pakistan Commissioner for Indus Waters (PCIW)	○	○	○	○	○	○	○	○	○	○
Pakistan Housing Authority	○	○	○	○	○	○	○	○	○	○
Pakistan Meteorological Department	○	○	○	○	○	○	○	○	○	○
Pakistan Public Works Department	○	○	○	○	○	○	○	○	○	○
Pakistan Railways	○	○	○	○	○	○	○	○	○	○
Planning Commission	○	○	○	○	○	○	○	○	○	○
Police (Other Law Enforcement Agencies)	○	○	○	○	○	○	○	○	○	○
Space and Upper Atmosphere Research Commission (SUPARCO)	○	○	○	○	○	○	○	○	○	○
Survey of Pakistan	○	○	○	○	○	○	○	○	○	○
Traffic Police	○	○	○	○	○	○	○	○	○	○
Water and Power Development Authority(WAPDA)	○	○	○	○	○	○	○	○	○	○
Federal DM Public Companies and Stakeholders										
Airline Companies	○	○	○	○	○	○	○	○	○	○
Banks	○	○	○	○	○	○	○	○	○	○
Ambulance Services	○	○	○	○	○	○	○	○	○	○
Hospitals	○	○	○	○	○	○	○	○	○	○
Insurance Sector	○	○	○	○	○	○	○	○	○	○
Landline Telecommunications Companies (NTC, PTCL)	○	○	○	○	○	○	○	○	○	○
Media	○	○	○	○	○	○	○	○	○	○
Mobile Telecommunications Companies	○	○	○	○	○	○	○	○	○	○
Pakistan Humanitarian Forum	○	○	○	○	○	○	○	○	○	○
Pakistan Red Crescent Society	○	○	○	○	○	○	○	○	○	○
Sui Northern Gas Pipelines Limited (SNGPL)	○	○	○	○	○	○	○	○	○	○
Sui Southern Gas Pipelines Limited (SSGPL)	○	○	○	○	○	○	○	○	○	○
International DM Supporting Organizations										
UN Agencies and Donors	○	△	△	△	△	△	△	△	△	△
IFRC	○	△	△	△	△	△	△	△	△	△
International NGOs	○	△	△	△	△	△	△	△	△	△
Local DM Governments:										
Province (P/R/SDMA)	●	●	●	●	●	●	●	●	●	●
District (DDMA)	●	●	●	●	●	●	●	●	●	●
Other DM Stakeholders										
Research Institutes/Universities	○	○	○	○	○	○	○	○	○	○
Companies	○	○	○	○	○	○	○	○	○	○
Communities	○	○	○	○	○	○	○	○	○	○
Domestic NGOs	○	○	○	○	○	○	○	○	○	○
Residents	○	○	○	○	○	○	○	○	○	○
Volunteers	○	○	○	○	○	○	○	○	○	○

Legend: ● Main Responsible ○ Responsible △ Supporting

6.2 Pre-Disaster Measures

6.2.1 Developing A Country and Cities Safe from Meteorological Disasters

1) Developing a National Land Safe from Natural Disasters

a. Floods

- FFC and local governments, with assistance from related national government Organizations, (SoP, GSP, SUPARCO, etc.), shall implement basic surveys to identify flood prone areas and to develop hazard maps. This information shall be provided to the relevant agencies. FFC and provincial governments shall transfer the information on risk areas of inundation and water levels during floods to DCOs (District Coordination Officers) and governors of relevant districts and provinces.
- FFC and local governments shall publicize the areas that have had inundation experiences in the past and high hazard risk areas of inundation to promote safe land use, and support the development of proper evacuation systems to be established by the district governments during flood and sediment disasters.
- FFC shall prepare the guidelines and policies for measures and basic strategies of river improvement, flood protection and river management; i.e., watershed management, construction of additional flood flows storage/reservoirs on major rivers, construction of medium/small dams over secondary/tertiary rivers and flood flow generating hill torrents, construction of flood protection structures (flood embankments, spurs, river training works, etc.) In those reaches that are exposed to riverine floods/flash floods. Proper and regular maintenance of existing flood management facilities by the respective provincial and federal agencies (structures and flood forecasting & warning system equipment); identification and provision of flood flow release/escape channels along barrages/head works across major rivers; flood plain mapping and zoning of all major rivers; flood plain mapping of all secondary and tertiary rivers; development of guidelines/regulations for the use/development of flood plains; up-gradation and expansion of existing national flood forecasting and early warning systems; development of a plan for removal of encroachments in flood plains (high risk areas) and their resettlement in safe areas off site from the flood bunds; identification of evacuation routes and approachable shelters at high elevation locations for flood-affected persons; and tentative future investment plans for implementation of the above-listed measures.
- FFC and local governments shall promote measures to protect metropolitan areas from devastating damage by extra-ordinary floods. Urban areas shall be deemed particularly important for effective flood control measures by taking into account past disasters and

the expected size and impact of damage from floods because these metropolitan areas play critical roles in the national economy of Pakistan.

- Local governments shall promote land use planning that is resilient to flood and sediment disasters by taking effective measures to control and regulate land development in hazardous areas (e.g., areas that may experience water overflow and inundation). In this regard, FFC shall prepare the guidelines for land use planning in floodplains and flood-prone areas.
- Local governments shall prepare idealized comprehensive flood control plans for all rivers/nullahs to be improved with the concepts of watershed management based on the related assessment, guidelines and policies to be prepared. In this regard, FFC shall evaluate these ultimate plans and the Federal Planning Commission (water sector) shall approve them as the basic framework for all implementations and activities regarding flood issues.
- Local/district governments (mainly provincial governments) shall take all measures for flood control and mitigation as the main implementing agencies in harmony with the structural measures, such as construction/rehabilitation of flood protection bunds, river structures and flood regulation facilities (flood control dams, flood water regulation ponds) by taking into account the regional characteristics subject to the comprehensive flood control plans, and non-structural measures, such as land use control in floodplain and flood-prone areas, institutional set-ups for flood issues and watershed management, preparation of hazard maps, human resources development, early warning systems and community-based risk management activities in collaboration with related agencies (NDMA and technical agencies (FFC, PMD, SoP, GSP, etc.)).

b. Cyclones (Storm Surges)

- NDMA, F/G/S/PDMAs and DDMA shall implement a basic survey of natural and socio-economic conditions in coastal areas to identify areas that are at risk for submergences and destruction of lands and buildings by storm surges (high tides) or strong winds due to cyclones and they shall promote measures for preventing damage from high-tide conditions, including facility enhancement and warning and evacuation systems.
- Local governments shall promote construction and/or improvement of coastal preservation facilities (e.g., coastal dikes, wave suppressors) by taking into account local geographic conditions so that damage by cyclones shall be mitigated.

c. Sediments (Landslide)

- Local government shall promote sediment control measures in mountainous areas, such as forestation for the purpose of disaster prevention and construction of landslide prevention facilities. At the same time, they shall promote comprehensive mitigation measures of sediment disasters, including early warning and evacuation systems in collaboration with FFC and PMD.
- GSP shall implement basic surveys including geographic and topographic conditions, rainfall, and land use in sediment disaster prone areas to understand the risk of hazards and needed measures. GSP, in coordination with NDMA and FFC, shall designate areas with a high risk for land failure of steep slopes as a "precautionary area for sediment disaster."
- F/G/S/PDMAs, DDMA and GSP, shall designate areas with high risks of sediment disaster based on the hazard assessment study and discussions with relevant agencies. Then, designated district governments shall establish comprehensive disaster management measures, including warning, evacuation and rescue systems, in association with the provincial governments, NDMA and PMD.
- DCO and related government divisions (GSP, F/G/S/PDMAs, FFC and PMD) shall provide residents with necessary information, including warning systems, mechanism of sediment disasters, and prompt evacuation methods and sites through the human resources development and community-based disaster risk management activities.

d. Droughts

- The local government shall promote mitigation measures in drought vulnerable areas, such as the expansion of irrigation systems and the provision of tube wells. At the same time, they shall promote early warning and non-structural mitigation systems in collaboration with the Ministry of Food Security and Research, PMD and PIDs.

2) Safety Measures for Important Facilities and Infrastructure

- NDMA, F/G/S/PDMAs and DDMA as well as facility management bodies shall examine potential areas of inundation by flood disaster and vulnerable areas by landslides. Public facilities are particularly important for emergency response, e.g., schools and medical facilities. Measures for security of public facilities against flood disaster shall be promoted.
- NDMA, F/G/S/PDMAs, FFC, NHA and local governments shall ensure a road network with security from disasters for preparation of disaster management activities.

- NDMA and F/G/S/PDMAs shall establish/revise building codes to construct secure buildings against disasters.
- Corporations providing lifeline services shall need to take safety measures to protect their facilities from disaster. Lifeline services include water supply, electricity, gas (oil), and telephone.

6.2.2 Promoting Citizen's Participation in Disaster Mitigation and Preparedness Activities

1) Promoting Culture of Disaster Management

- Protecting our own safety is fundamental in disaster management. Citizens shall be aware of the potential risk of natural disasters in normal times, and shall prepare appropriate actions to ensure their own safety in the time of disaster. In addition, they are expected to contribute to disaster risk reduction activities including supporting injured neighbors and the vulnerable population, and taking their own actions at evacuation shelters. In order to achieve this goal, NDMA, F/G/S/PDMAs, and DDMA, and public agencies shall pursue the promotion of awareness programs on disaster prevention.

2) Disseminating Disaster Management Knowledge and Training

a. Disseminating Disaster Management Knowledge

- Taking advantage of the Disaster Management Day (8th of October)/Week and relevant events, NDMA, F/G/S/PDMAs, DDMA and public agencies shall disseminate the information on flood and sediment disasters and their risk reduction measures. For example, NDMA, F/G/S/PDMAs, DDMA and public agencies shall indicate the necessity of emergency bags at home, which contain emergency food for 2 to 3 days, bottles of water, emergency goods (first-aid kit, torches, radio, batteries, etc.) and shall provide information on disaster prevention and safety measures to be taken when advisories and warnings are issued.
- NDMA, F/G/S/PDMAs and DDMA shall transmit a message for prompt evacuation of residents in case of a disaster. Local governments shall transmit information on evacuation places and routes to promote smooth evacuation of residents with support from relevant CBOs to disaster management associations during actual disasters. In cooperation with the national government and relevant agencies, DDMA shall conduct risk assessment to identify high-risk areas of meteorological disasters including floods, cyclones (high tide and storm surges), droughts and sediment (landslides) disasters for appropriate and accurate transmission and for the evacuation system prior to the coming disasters in their jurisdiction. DDMA shall also implement risk reduction measures and

prepare a contingency plan for the activities to be taken for appropriate evacuation of residents.

- DDMA, in collaboration with relevant agencies, shall develop hazard maps showing risk areas for flood, sediment and other meteorological disasters at the local level (tehsil and union). Local governments shall also prepare manuals that show comprehensive information on measures and actions to be taken at the time of disasters. These hazard maps and manuals shall be distributed to residents. With support from NDMA, F/G/S/PDMAs and DDMA, educational institutions and other relevant institutions shall provide disaster risk reduction education to local communities. To enhance public awareness of disaster risk reduction, visual materials and simulation experiences shall be utilized in cooperation with the mass media.
- NDMA and F/G/S/PDMAs shall develop the hazard and risk maps (district-wise Vulnerability Atlas of Pakistan) for the meteorological disasters to identify the vulnerable areas/districts in association with technical agencies (such as SoP, FFC, PMD, GSP, SUPARCO and engineering sections of the Pakistan Army).
- For better public understanding of flooding mechanisms, the national government (FFC, PMD, PIDs, NDMA and F/G/S/PDMAs) shall provide citizens with information on rivers and weather conditions that may cause flood disasters.
- Utilizing Disaster Risk Reduction Day/Week, NDMA, F/G/S/PDMAs, and DDMA shall organize relevant events and disseminate comprehensive information on flood and sediment disaster prevention.
- To develop the local capacity of disaster risk reduction, the NDMA, F/G/S/PDMAs and DDMA shall provide disaster management education and training to the general public.
- The Cabinet Secretariat shall promote disaster management education. The national and local governments should promote disaster management education in close cooperation with various actors in local communities.

b. Implementing and Training Disaster Management Drills

- NDMA, F/G/S/PDMAs, and DDMA shall conduct disaster management drills during the Disaster Risk Reduction Day/Week. NDMA shall conduct training of trainers (TOT) and local government officer (staff of DDMA and tehsils) training so they can learn risk reduction measures and evacuation behavior at the time of meteorological disasters including practical disaster management.
- F/G/S/PDMAs and DDMA shall conduct drills including emergency evacuation guidance through coordination with relevant Organizations, under the assumption of a flood at

underground facilities based on the training by NDMA.

- In conducting disaster management training, vulnerable groups of people such as the elderly, disabled, infants, and pregnant women shall be taken into careful consideration and need a local supporting system.
- In this context, all training and drills shall be coordinated through community-based activities.

c. Considering People Vulnerable to Natural Hazards in Disseminating Disaster Knowledge and Training

- In disseminating disaster knowledge and conducting training, the elderly, disabled, foreigners, infants, and pregnant women must be carefully taken into consideration and included in the local support system. In addition, different needs for men and women should be considered.

3) Improving the Environment of Citizen's Participation in Disaster Management Activities

a. Organizing and Developing Capacity of Community-based Organizations for Disaster Management

- NDMA and local governments shall encourage disaster management activities conducted by community-based Organizations, which play crucial roles in disaster management at the local level.
- NDMA and FFC and local governments shall provide facilitator training for disaster management activities. The training shall encourage the participation of community-based Organizations to strengthen their capacities for disaster management. Local governments need to identify the leaders of the Organizations and provide them with adequate training. Women shall also be encouraged to participate in the Organizations.
- NDMA, districts, tehsils, and union councils shall develop a facility for community-based Organizations to strengthen their capacities in disaster risk reduction. To achieve this, local governments need to identify the leaders of the Organizations and provide them with adequate training.
- NDMA shall take advantage of NIDM effectively as a training, education and research facility for disaster management.

b. Encouraging Volunteer Activities for Disaster Risk Reduction

- Districts, tehsil, and union councils shall coordinate DRM activities with volunteers for disaster risk reduction at the time of emergencies in close cooperation with volunteer Organizations.
- In cooperation with the Pakistan Red Crescent Society and the Ministry of Youth Affairs, Civil Defence and the Pakistan Humanitarian Forum shall improve the environment for volunteer activities so that these activities can be conducted smoothly at the time of disaster. In doing so, issues like volunteer registration in normal times, training programs, organizing a coordination system for volunteer activities at the time of disaster, and preparation for volunteer activities shall be also resolved through the research of NDMA (NIDM).

c. Promoting Disaster Risk Reduction Activities by Corporations

- Private companies should strive to promote the improvement of a disaster management system, implementation of disaster management drills, retrofitting of office buildings, disaster recovery plans, as well as recognize the role of corporations in the time of disaster (safety of lives, prevention of secondary disasters, continuation of business, contribution to and cooperation with local communities), and to develop a Business Continuity Plan (BCP) for continuing important operations in the time of disaster for each company.
- Therefore, NDMA, F/G/S/PDMAs and DDMA shall provide the information on these efforts to companies and prepare a good environment to promote disaster management in the private sector. Furthermore, NDMA, F/G/S/PDMAs and DDMA shall raise the awareness for disaster risk reduction for all staff members of companies, as well as promote corporation-led disaster risk reduction activities, giving awards and evaluating their disaster risk reduction activities.
- NDMA, F/G/S/PDMAs and DDMA shall conduct training and drills to local community members on: 1) methods for information transmission including river floods, flash floods, droughts, cyclones (high tide and storm surges) and other related meteorological disaster warnings, 2) evacuation sites and other important items needed for securing smooth and prompt evacuation, and 3) names and locations of facilities that may be needed to secure smooth and prompt evacuation of facility users during meteorological disasters. In particular, attention should be given to buildings located in low-lying areas during floods or facilities used by elders needing support during disasters. All of the above are to be based on the regional disaster management plan developed by districts and governments.

6.2.3 Preparedness for Prompt and Effective Emergency Response and Rehabilitation and Reconstruction

1) Collecting Information and Correspondences

- PMD shall promote reinforcement of the system, facilities, and equipment for observing storms, torrential rains, tropical cyclones, tornado winds, gusts and others. Also, PMD shall promote reinforcement of the system, facilities, and equipment, to enable monitoring and observation of high tides affected by storms and other phenomena.
- FFC, PMD, WAPDA, PID, Pakistani Armed Forces, National Police Bureau and local governments shall observe meteorological phenomena, i.e., rainfall and flood volume, oceanographic phenomena, water levels, etc. Also, they shall promote reinforcing the system, facilities, and equipment to collect and disseminate this information promptly and accurately in collaboration with NDMA and F/G/S/PDMAs.
- NDMA, F/G/S/PDMAs and DDMA shall need to put effort into establishing an information collection and correspondence system, including multiplexing routes for information transmission and clarifying the responsibility and routes of information collection/exchange, to ensure prompt and reliable communication among provinces, districts and governments, the national government, and other relevant disaster management Organizations.
- NDMA, F/G/S/PDMAs and DDMA shall promote development of a system for collecting information and correspondences within each Organization and among Organizations. The system shall be developed to correspond properly at all times.
- NDMA, F/G/S/PDMAs and DDMA shall need to put effort into introducing information technology (IT) into a system that collects information and transmits correspondences for prompt and accurate operation of disaster management activities.
- NDMA, F/G/S/PDMAs and DDMA shall need to put effort into establishing a common system for disaster information to enable the sharing of information among related Organizations.
- NDMA, F/G/S/PDMAs and DDMA shall collaborate with residents and put effort into developing an information transmission system to disseminate disaster information in a proper manner.
- For agile activities on information collection, NDMA, F/G/S/PDMAs and DDMA shall develop a system that enables the use of various means for information collection, e.g., aircraft, helicopters, patrol vessels, satellites and monitoring cameras to develop the collection of graphical information.
- NDMA, F/G/S/PDMAs and DDMA shall promote the development of an information collection and correspondence system by dispatching staff in disaster affected areas due to the

importance of prompt and appropriate collection and correspondences for disaster information.

- NDMA, F/G/S/PDMAs and DDMA shall need to put effort into developing a system for collecting disaster related information from various sources, including private companies, mass media, citizens and others for disaster management.
- PMD, FFC and local governments shall need to put effort into collecting information on rainfall and water levels of rivers and developing an information transmitting system to people and related Organizations. Local governments shall need to put effort into developing a dissemination system that is easy-to-understand for the entire population, including disaster vulnerable groups, like the elderly and handicapped.
- NDMA, PMD, the Ministry of Information & Broadcasting and local governments shall promote reinforcement of the mass media, multiple radio transmissions and mobile communication lines in order to secure information transmission during an emergency.
- FFC, PMD, WAPDA and local governments shall need to put effort into developing systems of collecting information on water levels of rivers and channels, inundation areas in basins, and water-covered roads. They shall also need to develop proper communication systems with hydrological observation stations, river management facilities such as dams, barrages, water gates and pumping stations to collect information promptly.
- PMD, the Pakistan Navy and local governments shall need to put effort into developing a system for disseminating information on high tides to residents, beach users, fishermen and others.

2) Establishing Emergency Response System

a. Emergency Response System

- NDMA, F/G/S/PDMAs and DDMA shall strengthen the emergency response system based on the National Disaster Response Plan (NDRP) for prompt and effective emergency response activities.
- NDMA, F/G/S/PDMAs and DDMA as well as public agencies shall need to establish an Emergency Mobilization System, including mobilization criteria, means of communication, location mobilized staff, and methods of information gathering/transmission. Moreover, they shall need to put effort into implementing drills and training to enable them to implement emergency response measures in the time of disaster.
- NDMA, F/G/S/PDMAs and DDMA as well as public agencies shall formulate manuals showing emergency response activities of staff in disasters. They shall implement

periodical drills and training to ensure procedures of emergency response, to familiarize usage of equipment/tools, and to coordinate among other staff and Organizations.

- NDMA, F/G/S/PDMAs and DDMA shall need to put efforts into formulating a scheme of training courses to enhance the capacity of staff in disaster management.

b. Establishing Coordination among Relevant Agencies in Disaster Management

- Coordination systems among relevant Organizations are important at the time of disaster. The national government, public agencies, and local governments shall enhance coordination of mutual assistance for emergency response activities.
- Pakistani national/local police and the Armed Forces shall need to cooperate to implement emergency rescue activities to respond to disaster.
- Fire brigades (Rescue 1122), Civil Defence and local governments shall put efforts into developing a mutual assistance system for lifesaving activities. Also, they shall make efforts to establish an Interregional Emergency Rescue Unit.
- NDMA, F/G/S/PDMAs and DDMA need to put efforts into developing a mutual supporting system that is needed for interregional evacuation.
- NDMA, F/G/S/PDMAs and DDMA shall need to put efforts into establishing an Emergency Response Base for operation and accommodation of police, fire brigade, armed forces, heliport, and facilities for transporting goods, to enable smooth implementation of emergency response activities.
- Local governments, in coordination with departments and agencies related to social welfare, shall need to put efforts into developing a system supporting vulnerable groups in case of disaster, such as formulating an evacuation assistance plan.

c. Establishment of F/G/S/PEOC and DEOC

- NDMA, F/G/S/PDMAs and DDMA, in close coordination with relevant agencies, shall establish F/G/S/PEOC and DEOC, which function as evacuation and disaster management centres during the time of disaster, according to the National Disaster Response Plan, March 2010.

d. Securing and Enhancing Central Disaster Management Function by NDMA

- NDMA, F/G/S/PDMAs and DDMA shall need to put efforts into establishing NEOC, F/G/S/PEOC and DEOC to be able to respond promptly against disasters. NEOC, F/G/S/PEOC and DEOC shall be located in a secure place against disaster and play the central role in emergency response.

- Local governments shall need to put efforts into designating facilities for emergency response at the time of disaster.
- NDMA, F/G/S/PDMAs and DDMA as well as medical agencies dealing with urgent medical treatment shall need to put efforts into equipping alternative energy sources to be able to supply electricity during a power failure.
- NDMA, F/G/S/PDMAs and DDMA shall consider disaster management coordination measures to be able to respond promptly against disasters.
- In response to disaster, local governments and relevant agencies shall consider preparing a stockpile and procurement system for food, water, and other necessary items.
- Rescue 1122 (fire brigade) and Civil Defence shall need to put efforts into developing base facilities for conducting emergency response activities.

e. Establishing Coordination of DRM activities among Provinces, Districts and Pakistani Armed Forces

- Provincial governments and Pakistani Armed Forces shall need to put efforts into enhancing coordination by sharing their own Disaster Management Plans to identify roles and functions of each Organization. During a disaster, they shall need to put effort into conducting mutual communication and information sharing, and enabling the Pakistani Armed Forces to dispatch disaster relief activities in the same manner as the federal government.
- NDMA, Provincial governments and Pakistani Armed Forces shall need to put efforts into preparing an emergency response plan, including the names of key personnel, communication and coordination methods.
- Provincial governments and Pakistani Armed Forces shall discuss sharing the activities of emergency response (e.g., rescue, first aid, medical treatment, emergency transportation, etc.).

f. Activities to Prevent Disaster

- Public facility administrator(s) shall develop a system for emergency inspection and urgent recovery of facilities, and preserve necessary equipment and materials for disaster response and urgent recovery. The disaster management body of each local government shall develop a system for activities related to disaster fighting.
- FFC shall develop/prepare its comprehensive flood management plan (NFPP-IV) in coordination with federating units covering all needs and requirements towards flood control and management at federal and provincial levels based on federal funding (Table 1).

- In order to conduct smooth flood managing activities, NDMA, F/G/S/PDMAs and DDMA, in cooperation with FFC, shall take necessary measures to remove debris, materials, and obstacles that are illegally placed or encroached to secure river management activities.
- FFC, WAPDA shall prepare SoPs/manuals of proper operations for dams/reservoirs wherever these SoPs/proper manuals do not exist. Further, FFC and WAPDA shall prepare revised SoPs for Tarbela as were required after the 2010 floods.
- All provincial irrigation departments shall also prepare SoPs/operation manuals for barrages, weirs, head works, etc. wherever they do not exist and shall revise them as and when needed based on ground conditions.
- PMD, in collaboration with provincial governments, shall need to put effort into providing advice on the effective use of information regarding early warning to district governments.

3) Rescue/First Aid, Medical Treatment

- NDMA, F/G/S/PDMAs and DDMA shall collect information on damage and communicate with medical agencies regarding necessary rescue/first aid and medical treatment activities.
- NDMA, F/G/S/PDMAs and DDMA as well as medical agencies shall need to put effort into enhancing the system for collecting information on damage and emergency medical treatment conditions.
- F/G/S/PDMAs and DDMA shall need to put effort into preparing vehicles (e.g., rescue vehicles, ambulance, lighting vehicles) and rescue equipment that is needed for emergency response activities in collaboration with Rescue 1122 (fire brigades) and Civil Defence.
- The national government (Pakistani Armed Forces, National Police Bureau, Pakistan Navy) shall prepare equipment for search and rescue.
- F/G/S/PDMAs and DDMA in cooperation with Rescue 1122 (fire brigades) and Civil Defence shall form a rescue team with equipment to respond to disasters, while putting effort into developing technology under the guidance of NDMA.
- The national government (Health Division), Pakistan Red Crescent Society, and local governments shall need to put effort into storing medicines and medical equipment that may be needed for first aid activities. Further, an urgent medical aid system needs to be established to respond to disasters.
- Local governments shall prepare a communication system within medical agencies.
- NDMA, in collaboration with the Ministry of Regulations and Services, shall promote: 1) identifying roles of medical facilities, 2) providing triage techniques (giving priority to take

medical treatment to patients), and 3) providing research and education/training related to medical treatment on sickness and injury caused by disaster.

4) Activities on Emergency Transportation

- F/G/S/PDMAs and DDMA shall identify available transportation facilities (roads, seaports, and airports) for emergency transportation during the time of disaster. NDMA, F/G/S/PDMAs and DDMA shall need further coordination to establish an emergency transportation network.
- Through discussion with NDMA and F/G/S/PDMAs, Pakistani Armed Forces, National Police Bureau and Pakistan Navy shall designate emergency heliport sites as emergency transportation facilities.
- NDMA, National Highway Authority (NHA) and local governments shall need to put effort into improving the safety of the emergency transportation network.

5) Activities on Evacuation and Accommodation

a. Preparation of Evacuation Sites and with Appurtenant Needs

- DDMA with assistance from NDMA and F/G/S/PDMAs shall designate emergency evacuation sites, such as urban parks, community halls and schools. Information of evacuation sites shall be disseminated to residents by DDMA prior to disasters. Ventilation, sanitary and lighting systems of evacuation sites shall be regularly examined and maintained in good condition.
- DDMA shall need to put effort into developing necessary facilities at evacuation sites, such as water tanks, wells, temporary toilets, blankets and telecommunication equipment. In addition, local government shall pay special attention to the people in vulnerable groups such as the elderly, handicapped, infants and women at evacuation sites.
- F/G/S/PDMAs and DDMA shall need to put effort into preparing emergency stockpiles such as food, water, power generators, medicine, and blankets at designated evacuation sites or places nearby.
- DDMA shall need to put effort into distributing information regarding operation and maintenance of evacuation sites to residents prior to disasters.

b. Temporary Shelters and Housing

- NDMA, F/G/S/PDMAs and DDMA and other local government agencies shall collect information on availability of materials, equipment and lands for construction of temporary shelters or tents. The land for construction of temporary shelters shall be safe against secondary disasters.

- DDMA shall need to put effort into collecting information on the availability of public housing or temporary shelters needed for disaster victims at the time of disaster.

6) Activities on Procurement and Supply of Food, Water and Daily Commodities

- Local governments (F/G/S/PDMAs, DDMA and health divisions), by assuming damage from disaster, shall prepare stockpiling of food, medicines and other commodities that are needed after the disaster. Also, local governments shall need to put efforts into establishing a stockpiling centre taking into account the distance to evacuation centres in case of disaster.
- The national government (Social Welfare and Special Education Division, Health Division, Pakistan Public Works Department, Information & Broadcasting Division) shall develop stockpiling systems for food, medical goods, and other commodities necessary in case of disaster.
- NDMA, F/G/S/PDMAs and DDMA shall designate stockpiling centres close to the transportation network, in order to distribute necessary commodities at the time of emergency.

7) Temporary Recovery Activities on Building and Utilities

- Public agencies shall develop systems to assess damage of their facilities and recovery measures related to their responsibilities (WASH, telecommunication, electricity, oil (gas), etc.).
- Lifeline corporations shall prepare a recovery plan for facilities prior to disasters. They shall need to put efforts into developing mutual damage recovery systems.

8) Activities on Distributing Appropriate Information to Disaster Victims

- Local governments shall develop various measures for emergency communication systems in disaster, including fixed landlines, mobile phones, and so forth.
- NDMA, F/G/S/PDMAs and DDMA as well as public agencies need to put efforts into developing proper systems to communicate with various people, including: 1) people who need rescue, 2) people who are isolated in the disaster areas, and 3) people who have difficulties in obtaining information.
- NDMA shall need to put effort into defining roles and responsibilities of each government agency for distributing necessary information to disaster victims.
- NDMA, F/G/S/PDMAs and DDMA, in cooperation with broadcasting corporations, shall need to make efforts on disseminating necessary information regarding disasters and livelihood information to disaster victims, when needed.

- Broadcasting and/or telecommunication corporations shall need to put efforts into developing systems for collecting and distributing information on disaster damage and confirmation on safety of people.
- NDMA, F/G/S/PDMAs and DDMA and other related local governments shall plan the systems to respond to inquiries from residents.
- PMD, FFC and related local governments, in cooperation with relevant public agencies, shall need to put efforts into upgrading information dissemination systems that collect and distribute information on rainfall, water levels, water quality, tide levels, river conditions, sedimentation, and high tides (storm surges) in a proper manner. Simultaneously, a real-time communication network system shall be developed among concerned parties.
- The Food & Agriculture Division shall promote developing an information delivery system for agriculture that may be damaged by floods (cyclone), landslides or droughts.

9) Activities on Preventing Secondary Disasters

- Provincial governments shall prepare concrete measures for protection of important facilities and areas from flood and cyclone disasters in cooperation with FFC and prepare prevention measures for other meteorological disasters (such as high tides, droughts and gusts) to prevent the affected areas from increased damage.
- NDMA, FFC, PMD and GSP shall promote training for experts on conducting assessments of sediment disasters caused by heavy rainfall.
- NDMA, PMD, WAPDA, PIDs and the Ministry of Food Security and Research shall promote activities to prevent the reduction in agricultural crop production from causing additional damage.
- Local governments shall store necessary materials and equipment for emergency response so as not to expand the damage in meteorological disasters.
- Local governments shall prepare necessary materials and equipment (heavy equipment for excavation, hauling and disposal of sediment) to prevent sediment disaster and the spread of damage, and to develop a system to implement prevention measures.

10) Activities on Accepting Foreign Assistance

a. Preparation of the Roster of Volunteers

- NDMA, F/G/S/PDMAs and DDMA as well as relevant agencies shall prepare the rosters for volunteers and CBOs to support the assessment and rescue and relief activities in the affected areas.

b. Preparation of the List of Relief Goods

- Local governments shall prepare a list of necessary relief goods and disclose its contents based on the assessment results in the past flood and sediment disasters prior to the occurrence of disasters.

c. Preparation of the List of Accepting Donations

- NDMA, F/G/S/PDMAs and DDMA shall prepare the list of the donations to be accepted and the procedures for use of donations in advance.
- NDMA, in association with the Ministry of Foreign Affairs Division, shall make a plan for the distribution protocol of foreign donations.

11) Implementing Disaster Management Drills by the Relevant Agencies of Disaster Management

a. Implementation of Disaster Management Drills at National Level

- NDMA F/G/S/PDMAs and DDMA shall strengthen the cooperation with public agencies, and actively implement disaster management drills and meteorological disaster prevention exercises for large-scale floods and sediment and other relevant meteorological disasters.
- NDMA F/G/S/PDMAs and DDMA shall reinforce information collection and communication transmission systems, as well as implement practical disaster management drills, including wide-area disaster response drills, which will take place upon request from affected local governments to the national government. They shall also organize exercises for setting up DEOC in an affected area.

b. Implementation of Disaster Management Drills at Local Level

- Local governments, public agencies and other relevant agencies shall conduct disaster management drills with national agencies such as the NDMA, National Police Bureau, and Pakistani Armed Forces, in close collaboration with supporting Organizations for meteorological disasters prevention, CBOs for disaster management, Information & Broadcasting Division, private enterprises, volunteer Organizations and local residents including those who are vulnerable to disasters.
- NDMA, F/G/S/PDMAs and DDMA as well as public agencies shall conduct practical drills, setting various conditions such as well-thought-out implementation time and damage due to meteorological disasters, also incorporating the contents that participants need to judge by themselves. After conducting the drills, the NDMA, F/G/S/PDMAs and DDMA shall evaluate the drills, bring out issues and improve their systems as needed.

12) Preparing for Disaster Rehabilitation and Reconstruction

- NDMA and F/G/S/PDMAs shall promote preparation of a practical manual of recovery and reconstruction from disaster that is to be used by affected local governments in preparing their own rehabilitation and Reconstruction Plan.
- F/G/S/PDMAs and DDMA shall prepare the rehabilitation and Reconstruction Plan(s) for meteorological disasters in the future.
- With support of NDMA, F/G/S/PDMAs and DDMA, local governments collect and manage various data of cadastral and land use maps, locations of public facilities and underground facilities, and other relevant information prior to disasters.
- Managing bodies of public civil facilities shall organize information such as structural drawings and ground foundation conditions of important facilities prior to disasters for prompt action of post-disaster reconstruction.
- National governments (Ministry of Interior, Ministry of Industries and Production) shall establish a disaster-resilient information/communication system prior to disasters to promote rehabilitation and reconstruction in a proper manner in case of disaster.
- NDMA and F/G/S/PDMAs shall prepare the guidelines and manuals for the establishment of a disaster-resilient information and communication system for all related governmental agencies providing sample(s) of SOPs.

6.2.4 Promotion of Research and Observation

1) Promotion of Research and Observation on Meteorological Disasters and its Management

a. Promoting Research and Collecting Basic Data

- Planning Commission (Water), FFC and WAPDA (Ministry of Water and Power), PMD, and the Ministry of Food Security and Research shall promote science and technology of the mechanism of meteorological disasters (such as flood, sediment (landslide), cyclone (high tide and storm surge including gust) and drought) and their prevention measures. On this occasion, FFC shall underscore coordination with other research institutions and support NDMA to prepare practical flood management policies.
- Planning Commission (Water), FFC, PMD and the Ministry of Water and Power shall: 1) collect basic data on flood, cyclone and sediment disasters; 2) enhance research facilities and equipment; 3) promote research on disaster management in collaboration with other research institutions and universities; and 4) promote research and development related to disaster management technologies.

- NDMA and FFC and other relevant research agencies shall promote sharing the data to enhance disaster management systems including the monitoring system.
- For drought disasters, Planning Commissions (Water & Agriculture), PMD and the Ministry of Food Security and Research shall also collect basic data with an appropriate monitoring system, enhance and promote research facilities and equipment in collaboration with other research institutions and universities.

b. Fulfilling and Enhancing Forecast and Observation

- PMD, WAPDA and local governments shall strengthen the observation system and facilities to measure rainfall and water levels.
- PMD shall upgrade climate forecasting method and technologies, such as more accurate weather forecasting by region and forecasts of sudden changes of wind blasts (e.g., cyclone and tornados) and exceeding continuous weather conditions.
- PMD, FFC, GSP, NDMA and provincial governments shall develop and upgrade technologies to forecast the risk of landslide debris flow, cliff failure, and other sediment related disasters (considering the precipitation volume).
- PMD, WAPDA and Provincial Irrigation Department (PID) shall develop a forecasting system for water levels at rivers by using the newest information and technologies.
- FFC and PMD shall analyze the causes of damage by referring to past disasters and shall inform the results of analysis to NDMA, F/G/S/PDMAs, and DDMA upon needs. NDMA, F/G/S/PDMAs, DDMA and PIDs shall modify standards and regulations to minimize future losses.
- NDMA, FFC, and PMD shall promote that local governments establish a system of warning and evacuation, which utilize the alerting information on meteorological disasters.
- Local governments shall prepare manuals that identify hazard risk areas, evacuation criteria, methods for information transmission, evacuation locations, and evacuation routes. This information shall be developed in cooperation with FFC, PMD and PID. Additionally, local governments shall make a plan to guide evacuation at the time of disaster occurrence and conduct drills of disaster management through discussion with Civil Defence and relevant CBOs.
- Local governments shall need to put effort into setting criteria for warnings and evacuation to cope with the level of disasters in advance. NDMA and F/G/S/PDMAs shall provide necessary advice and consultations for setting these criteria in corporation with technical agencies (FFC, GSP, PMD, etc.).

- For prompt evacuation guidance for vulnerable groups of people (i.e., elderly and the handicapped), local governments shall need to develop a system to guide evacuation, which includes an information dissemination system, information transmitting to vulnerable groups, and an evacuation assistance plan through cooperation with residents, CBOs and welfare Organizations.
- Local governments, in collaboration with facility management bodies, shall need to develop a secure safety system, including evacuation guidance from facilities that are located in low-lying areas and/or used by an unspecified number of people.

6.3 Emergency Response Measures

- In case flood or sediment disasters occur or may soon occur, prompt response is crucial. To be prepared for such an event, the following items should be conducted during normal times. Particularly, district governments should practice prompt and smooth evacuation of residents and reinforce evacuation assistance measures for vulnerable groups, including the elderly, women, children and handicapped persons. There are three levels of evacuation information: evacuation preparedness, evacuation directive, and evacuation order.

6.3.1 Measures against Disasters just before Occurrence

- In order to reduce damage by flood or sediment disaster, it is critical to carry out various actions properly such as leading residents to evacuation sites before the disaster. In particular, it is important that district governments prepare a manual showing the evacuation system in advance. For example, they shall disseminate information on evacuation preparedness so even those in vulnerable groups will be able to evacuate promptly.
- District governments have a primary responsibility for emergency response activities as the administrative bodies closest to citizens. Provincial governments shall deal with more comprehensive emergency response activities. In case of a large-scale disaster that exceeds the capacity of local governments, NDMA shall actively assist in their emergency response activities.
- Flood or sediment disaster risk can be predicted to a certain degree by analysis of meteorological and hydrological information. Therefore, local governments shall need to disseminate information, including meteorological and hydrological information, proper evacuation guidance, and actions for preventing disaster damage.

1) Warning Transmission of Flood or Sediment Disasters

- PMD shall inform the general public through NDMA, F/G/S/PDMAs, DDMA and the media about meteorological conditions such as wind and rainfall, warnings, etc. This information

- shall be promptly disseminated in cooperation with mass media, other agencies, districts, tehsils, and union councils, in cases where there is a possibility of disaster occurrence.
- PMD shall need to put effort into providing rainfall forecasting information as accurate as possible in order to assist prompt action for flood fighting activity.
 - PMD shall need to put effort into providing predictive information on floods, tropical cyclones, droughts, tornados and gusts as early as possible, with the aim of reduction of damage.
 - The Provincial Irrigation Department shall need to put effort into providing actual flood discharge data at its administrating locations, such as barrages and irrigation facilities, to PMD and related districts.
 - WAPDA shall need to put effort into providing rainfall data and inflow/outflow discharges at administrated dams to PMD and related districts.
 - PMD, FFC, Pakistan Navy and local governments shall collect data on floods, cyclones and high tides, which may cause damage to residents. In cases where damage is predicted, they must promptly disseminate information to residents through relevant agencies and mass media. On this occasion, they shall need to put effort into disseminating information that is easy-to-understand for the entire population including disaster vulnerable groups.
 - NDMA, FFC and provincial governments shall transmit flood warnings to flood fighting management bodies if necessary in terms of flood fighting activity. Based on this warning, CBOs for disaster management, Pakistani Armed Forces, Civil Defence, and other Organizations shall start mobilization for flood fighting activity.
 - In case flood(s) are likely caused in accordance with their prediction and forecast methodologies, PMD together with FFC, WAPDA and PID shall inform relevant governors about the situation/warning indicating the water level, discharge, or areas to be inundated or damaged and inundation depth to be expected, caused by floods. They shall also inform public in cooperation with mass media, where necessary. Further, when DCOs receive the information/warnings, head of governments (provincial ministers, governors, chiefs and DCOs) shall immediately convey instructions for immediate actions to flood fighting bodies and water gauge management bodies.
 - PMD, in cooperation with provincial governments, shall need to warn the concerned DDMAAs of sediment disaster (landslide, etc.) in accordance with their prediction and forecast methodologies, to be able to prepare disaster management activities and/or to issue evacuation order to residents, when risk of sediment disaster increases due to heavy rainfall.
 - PMD and WAPDA together with provincial governments shall also need to warn the concerned DDMAAs and agricultural agencies at all levels of drought conditions in accordance

with their prediction and forecast methodologies, to be able to prepare disaster management activities and/or to support affected farmers, when risk of drought disaster increases due to extraordinary weather conditions.

- Local governments shall need to put effort into providing evacuation information to residents, including evacuation directives, evacuation orders, and evacuation preparedness according to the level of urgency and the defined related SOP in advance.

2) Leading Evacuation of Residents

- In case flood or sediment disasters may soon occur, local governments shall need to collect meteorological information in collaboration with PMD, FFC and CBOs. If any emergency risks are recognized, local governments shall provide information on evacuation preparedness, evacuation directives and evacuation orders to residents in risk areas of flood or sediment disasters.
- In case disasters may soon occur, local governments shall establish evacuation place(s) where necessary, and inform it to residents.
- For the purpose of dissemination of evacuation orders to residents promptly, local governments shall need to use effective and reliable transmission means such as radio communications, SMS and other resources.
- For evacuation guidance, local governments shall need to put effort into providing information on evacuation locations, evacuation routes, inundation areas, and risk areas of sediment disaster.
- Evacuation by helicopter and vessel shall be investigated, if necessary.
- Local governments shall need to put effort into making sufficient considerations for vulnerable groups of people when they provide evacuation guidance.
- Prior to cancellation of the evacuation order, local governments shall need to confirm safety sufficiently.

3) Actions for Preventing Disaster Damage

- Flood fighting management bodies defined in each district and PID shall inspect river embankments and river structures based on the flood fighting management plan (contingency plan or SOPs) prepared in advance, and implement emergency response activities in the places that are judged as dangerous points in terms of flood and sediment control and other countermeasures for meteorological disasters if any.

- FFC, Provincial Irrigation Departments, WAPDA, Pakistan Coast Guard and the management body of agricultural drainage facilities shall need to properly operate dams, weirs, barrages, water gates and other facilities, in cases where floods or high tides may soon occur.
- In order to implement prompt flood fighting activities on site, Civil Defence and Pakistani Armed Forces, in collaboration with FFC and local governments, shall set an alerting zone where necessary. Then, they shall restrict access to the zone and/or order the residents to evacuate from the zone.

6.3.2 Securing Information Collection, Dissemination and Communication

1) Collecting Damage Information for Rapid Assessment, and Correspondences

- Just after disaster occurrence, NDMA, F/G/S/PDMAs and DDMA as well as relevant agencies shall collect information on damage from both public and private sectors affected by the disaster, which include infrastructure and lifeline damage, the number of houses damaged, human loss and injured persons in strict accordance with relevant SOPs and manuals. NDMA, FFC and local governments shall promptly collect information on damage through inspection by the staff of DDMA and CBOs.
- In case of large-scale flood or sediment disaster, NDMA, FFC, National Police Bureau, Pakistani Armed Forces, Emergency Relief Cell and local governments shall collect information by visual inspection, aerial photos, and/or satellite imaging provided by SUPARCO and other cooperative foreign agencies.
- In order to grasp the damage situation promptly, the National Police Bureau shall actively collect information from the field and FFC shall collect information about activities of CBOs. These data shall be evaluated and compared with original data from DDMA.

2) Securing Means of Communication

- NDMA, F/G/S/PDMAs and DDMA, telecommunication corporations and other relevant agencies shall need to put effort into developing a secure communication system during the time of disaster, including 1) reinforcement of security of information transmission facilities against disaster and measures to avoid electrical power outage of their facilities, 2) risk distribution of information transmission facilities, 3) multiplexing communication routes, 4) promotion of burying communication cables, 5) construction of a backup system, and 6) promotion of digitalization to secure communication at the time of disaster. NDMA, F/G/S/PDMAs and DDMA as well as relevant agencies shall need to put effort into developing an emergency communication system, such as an integrated operation of a wired and radio communication system.

- In order to secure emergency communication at the time of disaster, relevant agencies shall: 1) conduct maintenance of communication facilities during normal times, and 2) participate in communication training and drills to acquire proficiency in handling of emergency communication and operation of equipment. Consequently, this training is critical for formulating an emergency operational plan and conducting sufficient coordination on operation among relevant Organizations in pre-disaster period.
- Develop a system that utilizes a mobile communication network, which is effective at the time of disaster, e.g., mobile phone and automobile telephone, commercial mobile communication, ham radio and others.
- Need to put effort into establishing an image information transmission system, which collects information on the disaster-affected area by video system, and transmits it promptly to a central agency, such as NDMA and F/G/S/PDMAs. Also, it is essential to promote developing a communication network that distributes collected image information to agencies related to disaster management.
- The Ministry of Information & Broadcasting shall need to put effort into developing priority telephone lines at the time of disaster and a phone voice-mail service for disaster-affected people.

6.3.3 Securing Emergency Response Operation System

- It is essential to establish and maintain an appropriate Emergency Response Operation System in Pakistan for the alleviation of damage due to the occurrences of disasters. In this regard, the NDMA has already created the National Disaster Response Plan (NDRP) and operated pre-, during- and post-disaster response systems in accordance with the NDRP since March 2010. The NDRP shall be updated and improved in response to the actual disaster experiences for far more suitable response actions by NDMA.
- Prior to disasters, various agencies must prepare to provide rescue and relief actions in accordance with hazards and risks analysis. In addition, various unexpected matters and issues to be treated will take place during real disasters. Stakeholders will accumulate the good examples/practices and lessons learnt from such actual experiences. In this regard, the best system will be evolved through the revision, modification and improvement of the original one. Therefore, definitions and descriptions in this Plan set forth the general concepts and basic policies. The purpose of this section is to explain the basic response functions and principles of various agencies of emergency response by different stakeholders. The details for the Emergency Response Operation System shall be prescribed in individual plans, SOPs and manuals, such as NDRP, Flood Contingency Plans of each district government and SOPs for PMD.

- The natures and principles for response operation against disasters are as follows:

1) Establishing System of National and Local Governments for Actions

- National and local governments, promptly after the forecast, prediction or any other facts that disasters are likely to happen, take necessary actions as: 1) emergency gathering of staff, 2) secure information collection and transmission system, 3) commencement of operation of NEOC, F/G/S/PEOCs and DEOCs.
- NEOC, F/G/S/PEOCs and DEOCs need to put efforts into securing close coordination among related governmental Organizations defined in each disaster preparation manual or equivalent definitions, and public agencies.
- For the commencement of actions of NEOC, F/G/S/PEOCs and DEOCs for each disaster, the following table shall basically be referred to:

Table 6.4 Basic Policy for the Commencement of Activation of NEOC/F/G/S/PEOCs/DEOCs

Disaster	Timing for Activation of NEOC/F/G/S/PEOCs/DEOCs
Flood	June 15 – September 30 (monsoon season) and Individual Warning/Report of Floods (October 01 – June 14)
Cyclone (Storm Surge)	"Cyclone Watching" issued by PMD
Landslide	Qualitative Forecast (Blue, Yellow and Red) for Heavy Rainfall Reports of dangerous condition from related agencies or individuals Individual Warning*1/Report of Landslides
GLOF	Reports of dangerous condition from related agencies or individuals Individual Warning*1/Report of GLOFs
Drought	Serious Drought Advisory by PMD Abnormal Water Level Report of Dams/Reservoirs by WAPDA Individual Report of Damage Drought
Disease	Report of the Occurrences of Disease Epidemics by Health Related Agencies

Note: *1: Landslides and GLOF EWS have not been prepared (as of 2011). Therefore, related agencies and governments should promote the creation of their EWS.

2) Establishing Wide-Area Assistance System

- NEOC/F/G/S/PEOCs/DEOCs shall ask for support from other national and local governments, depending upon the scale of damage for the preparation and execution of rescue and relief activities in accordance with individual contingency plans and SOPs or equivalent documents prepared by related agencies and governments.
- Basically, DDMA (DEOCs) shall make every effort for localized emergency events by themselves. The DDMA is capable of handling the situation on its own. In case of an emergency/disaster that overwhelms the capacity of the DDMA, to manage the situation, DDMA can request assistance from F/G/S/PDMAs. In case emergency/disaster is beyond the capacity of provincial/regional governments, the NDMA shall take action with the support of international assistance. In this connection, it is considered that local governments outside

the affected area could establish and execute a support system promptly subject to the agreement concluded in advance between mutual related agencies when large-scale disasters occur.

3) Preparation of System for Action of NDMA, F/G/S/PDMAs, DDMAs and Other Relevant Organizations

- When a large-scale meteorological disaster occurs, NDMA shall establish NEOC and collect information, report to the Prime Minister, coordinate with other relevant ministries, and shall focus on total coordination for prompt initial responses of the national government.
- When disaster seems likely to occur or actually occurs, DDMAs shall activate their DEOC and collect information, report to the DCO, coordinate with other relevant sections and agencies, and shall focus on total coordination for prompt initial responses within the district section and agencies. These actions shall be informed to their upper F/G/S/PDMAs.
- When disaster seems likely to occur or actually occurs beyond the area of district jurisdiction or management capacity of the district government, F/G/S/PDMAs shall activate their F/G/S/PEOC and collect information, report to the minister and governor, coordinate with other relevant ministries/departments and agencies, and shall focus on total coordination for prompt initial responses within the provincial government. These actions shall be conveyed to NDMA even though the disaster is supposed to be managed by the provincial government independently.
- When large-scale disaster seems likely to occur or actually occurs beyond the abilities of provincial governments, NDMA shall activate NEOC and collect information, report to the Prime Minister, coordinate with other relevant ministries, and shall focus on total coordination for prompt initial responses of the national government.
- Promptly after occurrence of disaster, governmental Organizations and public agencies shall activate their systems necessary to gather staff, information collection/correspondence, and establishment of EOCs in accordance with their individual contingency plans, SOPs or equivalent documents prescribed in advance.
- Governmental Organizations and public agencies need to put efforts into securing close coordination among relevant Organizations, agencies, and national and local governments.
- If necessary, lifeline corporations shall need to put efforts into coordinating a wide-area assistance system for emergency recovery measures.

4) Holding Meetings of Correspondences among Departments and Agencies relevant to Disaster Management

- When large-scale disaster occurs, if necessary, Meetings of Correspondences among ministries and agencies related to disaster management are to be held to coordinate emergency response measures at all levels (federal, provincial and district), and confirmation/sharing of initial information on disasters and its damage. These meetings shall be arranged by the NDMA, F/G/S/PDMAs and DDMA at all levels. The procedures shall be separately stated in SOPs or equivalents in detail.
- When ministries and agencies relevant to disaster management grasp the existing condition of the disaster-affected area, to implement prompt and effective emergency response measures, if necessary, an investigation team consisting of officials and experts will be dispatched to the sites.

5) Gathering Staff (Teams) for Emergency and Holding Minister Councils

- When disaster occurs, DDMA mobilize emergency staff (a team) to its DEOC and collect information to be able to implement initial response by district governments and agencies. These actions shall be informed to their upper F/G/S/PDMAs.
- When disaster occurs beyond the area of district jurisdiction or management capacity of the district government, F/G/S/PDMAs shall mobilize emergency staff (a team) to F/G/S/PEOC, and collect information to be able to implement initial response by provincial governments and departments. These actions shall be informed to NDMA.
- When large-scale disaster occurs beyond the abilities of provincial governments, NDMA will mobilize emergency staff (a team) to NEOC and collect information to be able to implement initial response by the national government.
- If necessary, the chairmen of NDMA, F/G/S/PDMAs and DDMA shall hold emergency meeting(s) with the related officers (ministers, DGs, etc.), to discuss response activities on basic policy on measures, response system, and other important topics at all levels.

6) Establishing NEOCs and other Related Centres for Responding to Disaster Emergency

a. Establishing NEOC for Responding to Emergent Disaster and System for Action

- When large-scale damage is confirmed through collected information, NDMA shall promptly establish NEOC (Level 2).
- When the establishment policy of NEOC (Level 2) is decided, NDMA shall start the necessary process promptly to establish NEOC (Level 2). Fundamentally, NEOC (Level 2)

and its Secretariat are located in NDMA building.

- Members of NEOC (Level 2) mainly consist of the director and deputies of NDMA and relevant ministries.
- To be able to implement emergency response measures precisely and promptly, the head of NEOC (Level 2) shall give necessary instructions to heads of governmental Organizations, local governments, public agencies, and other relevant Organizations relevant to disaster management.

b. Establishing NEOC for Responding to Seriously Large Disasters and System for Action

- Based on information collection, if the scale of damage is confirmed as Level 3 of NDRP, NDMA shall establish NEOC (Level 3) by approval of the Chairman of NDMA.
- When the basic policy on establishment of NEOC (Level 3) is decided, NDMA shall follow the necessary procedure and establish NEOC (Level 3) promptly.
- To be able to implement emergency response measures precisely and promptly, the head of NEOC (Level 3) shall give necessary instructions to heads of governmental Organizations, local governments, public agencies, and other relevant Organizations relevant to disaster management.
- Secretariat of NEOC (Level 3) shall empower a response system based on the scale of damage, and formulate a task force team consisting of staff from NDMA and relevant ministries. The task force team shall coordinate comprehensively and operate activities by separating kinds of emergency response measures in groups.

c. Declaration of Emergency by NDMA, F/G/S/PDMAs and DDMA

- The declaration of emergency depends upon the nature and size of the disaster. The normal practice is that a district level emergency is declared by the district administration. In case the emergency is beyond the capacity of district management, the Chief Minister (provincial) with the approval of Cabinet declares an emergency. A national level emergency is declared by the Prime Minister of Pakistan in the event of larger calamity.
- As for the criteria for declaring an area affected by disaster, NDRP/PDRPs/DRPs shall define it as has been done in the past for each disaster (disaster-wise criteria is recommended).

d. Collection and Dissemination of Information and Establishment of System

- As described above, NEOC/F/G/S/PEOCs/DEOCs shall collect information on the disaster, damage including scale, list and amount by the disaster and inform heads of governments

(DCO, minister/governor, Prime Minister), agencies concerned (police, fire brigades (Rescue 1122), Civil Defence, Irrigation Offices, Civil Works Office, health-related offices, public utility corporations, revenue offices, international cooperation agencies, NGOs, INGOs and the upper EOC) and media of them in collaboration with related agencies (such as PMD, FFC, PIDs, WAPDA, Ministries of Health). These information systems consisting of hard and software with human resources shall be prepared.

e. Holding of (Coordination) Meeting with Related and Concerned Agencies

- As prescribed above, NEOC/F/G/S/PEOCs/DEOCs shall hold and coordinate the meeting at each level (federal, provincial, district levels respectively) with related and concerned agencies for the quick and prompt actions (evacuation, rescue, relief and response) and arrangement of their activities at appropriate intervals.

f. Arrangements and Preparations for Evacuation, Rescue and Relief Activities

- F/G/S/PEOCs/DEOCs shall arrange and prepare the activities and actions for evacuation, rescue and relief in collaboration with related agencies prior to the disaster.
- F/G/S/PEOCs/DEOCs shall arrange and prepare the evacuation site in accordance with the contingency plan, SOPs or equivalent documents prepared by each government and agency in advance.

g. Issuance of Alerts and Evacuation Orders

- NEOC/F/G/S/PEOCs/DEOCs shall inform the public and residential people who are likely to be affected by the disaster on the situation regarding the disaster source (such as intensity of rainfall, location of cyclone, etc.), hazard and risk prediction/forecast with areas to be likely affected, and the support/assistance system by government in real time in parallel with media and the original source (PMD, PIDs, etc.).
- Significant issuance (evacuation order or equivalent) shall be issued by heads of government, such as DCO in accordance with their jurisdictions.
- NDMA, F/G/S/PDMAs and DDMA shall arrange and coordinate the issuances to be publicized and advise the head(s) of governments. In this connection, the message(s) to be publicized for alert(s) and evacuation shall be prescribed in advance by related plan(s), SOP(s) or equivalent document(s) for each disaster by NDMA, F/G/S/PDMAs and DDMA.
- All issuances of alerts and evacuation orders to be issued shall basically be shown as in the table below by the degrees of warning.

Table 6.5 Basic Standards for the Issuance by Head of Government^{*1}

Disaster	Alert of Disaster (Preparation of Evacuation)	Evacuation Order
River Floods	Qualitative Forecast and Quantitative Forecasts issued by FFD_PMD	Quantitative Forecasts, Significant Flood Forecast and Areal Flood Inundation Flood Forecast issued by FFD_PMD
Flash Floods	Weather Information by FFD_PMD "Pre-Alert" and "Alert" in accordance with EWS to be established by PMD ^{*2}	"Evacuation" in accordance with EWS to be established by PMD ^{*2} Actual Inundation Overflow Condition
Cyclones (Storm Surge)	"Tropical Cyclone Alert" issued by TCMC_PMD	"Tropical Cyclone Warning" issued by TCMC_PMD
Landslides	Reports of dangerous condition from related agencies or individuals "Pre-Alert" and "Alert" in EWS to be established by PMD ^{*2}	Reports of dangerous condition from related agencies or individuals with certain rainfall "Evacuation" in EWS to be established by PMD ^{*2}
GLOF	Reports of dangerous condition from related agencies or individuals "Pre-Alert" and "Alert" in EWS to be established by PMD ^{*3}	Reports of dangerous condition from related agencies or individuals "Evacuation" in EWS to be established by PMD ^{*3}
Drought	In accordance with instruction(s) by related agencies and actual conditions	
Disease	In accordance with instruction(s) by health related agencies	

Notes: ^{*1}: Cancellation of Warning/Alert/Evacuation shall be prescribed by related plan and SOP. Based on the establishment and evolution of EWS, the basic standard mentioned above shall be improved.

^{*2}: As of 2011, PMD has established localized flash flood EWS only in Lai Nullah (Rawalpindi). Therefore, related agencies and governments should promote the creation of their EWS.

^{*3}: Landslides and GLOF EWS have not been prepared (as of 2011). Therefore, related agencies and governments should promote the creation of their EWS.

h. Conduct of Damage Assessment for Relief, Response and Rehabilitation

- NEOC, F/G/S/PEOCs and DEOCs shall determine status of disaster-affected areas, and to be able to implement emergency response measures promptly and precisely, if necessary, dispatch survey teams and coordinate comprehensively on emergency response measures implemented by governmental Organizations, local governments, and public agencies.
- NDMA, F/G/S/PDMAs and DDMA shall conduct the initial damage needs assessment immediately after the disaster not only for relief and rescue activities but also for rehabilitation and reconstruction. In this regard, DDMA shall utilize the uniformed damage assessment format, which NDMA, F/G/S/PDMAs and DDMA shall separately prepare and state, to execute objective validation for the comparison of the degree of damage between bilateral affected areas. This damage need assessment shall be conducted and reviewed at suitable periodical intervals until the commencement of rehabilitation works.

6.3.4 Rescue/First Aid, Medical Treatment

- Top priorities to protect lives and bodies from injuries are to provide: 1) rescue and first aid activities for victims, and 2) medical treatment for the injured people.
- Pakistani Armed Forces, National Police Bureau, Pakistan Navy, Rescue 1122 and Civil Defence shall be basically responsible for rescue and first aid activities.
- It is also indispensable that residents and community Organizations for disaster management will voluntarily rescue and begin first aid activities, while coordinating with individual agencies relevant to rescue and first aid.

1) Rescue/First Aid Activities

a. Role of Residents and Community Organization for Disaster Management

- Residents and community Organizations for disaster management shall voluntarily rescue and begin first aid activities, while coordinating with individual agencies relevant to rescue and first aid.

b. Rescue/First Aid Activities by Affected Local Governments

- Affected local governments need to take rescue and first aid actions while attempting to collect damage and loss information at an early stage; they shall then ask for support from NDMA to respond to the emergency, e.g., NEOC and F/G/S/PEOC, and other unaffected local governments. Further, the affected local governments shall secure areas for emergency response actions and places to stay for the incoming agencies.

c. Rescue/First Aid Activities by Local Governments External to Affected Areas and National Agencies

- Local governments outside the affected areas will provide rescue/first aid activities promptly and smoothly based on requests and pre-disaster cooperation agreements.
- NDMA and F/G/S/PDMAs will request/direct support of the Pakistani Armed Forces, National Police Bureau, Pakistan Navy, Rescue 1122 and Civil Defence, and the Ministry of Regulations and Services upon needs.
- NDMA and F/G/S/PDMAs will be orchestrating the entire coordination of agencies and departments such as the Ministry of Regulations and Services, Rescue 1122 and Pak-Army that will provide rescue and first aid activities upon needs or requests from relevant agencies. Such coordination will help relief providers act promptly and smoothly.
- DDMA in collaboration with Revenues Office, the police and Civil Defence shall take action to support relief activities in wide areas, e.g., dispatching emergency relief troops in wide

areas upon need.

- Pak-Army shall provide rescue and first aid activities upon need or requests by NDMA, F/G/S/PDMAs and DDMAAs.
- Pakistan Navy is responsible for rescue and medical aid on sea, and shall support the activities of affected local governments when available and needed, or based on a request from NDMA, F/G/S/PDMAs and DDMAAs.
- Equipment and supplies needed for rescue and first aid activities will be supplied in principle by the institutions and agencies that will provide such activities.
- NDMA, F/G/S/PDMAs and DDMAAs will secure equipment and supplies for rescue and first aid activities with support from private sector, if needed, to provide efficient and smooth operation.

2) Medical Treatment Activities

a. Activities on Medical Treatment by Medical Agencies at Affected Area

- Affected local governments will provide medical activities at public medical institutions in their jurisdiction, while requesting cooperation from private medical institutions in their jurisdiction upon need.
- The national government (Ministry of Regulations and Services, Pakistan Army) and Pakistan Red Crescent will provide medical activities at medical institutions in the affected region, such as state hospitals and medical clinics, hospitals at state universities, armed forces, hospitals, and hospitals operated by the Red Crescent.
- Medical institutions in the affected districts will be responsible for urgent recovery of hospital buildings and medical equipment from damage, while requesting lifeline corporations, if needed, for such rehabilitation.
- Medical institutions in the affected areas will mutually share information with other institutions in the region to be able to respond to a possible dramatic increase in the number of patients. Cooperation will be requested with utmost effort to other medical institutions if support is needed.
- Medical institutions in the affected area will need to put effort into dispatching medical aid troops under certain conditions.
- F/G/S/PDMAs and DDMAAs will comprehensively coordinate medical activities, e.g., dispatching plan of medical aid troops, either by need or request from affected local governments (districts or tehsils).

- NEOC, F/G/S/PEOCs and DEOCs as well as medical institutions shall collect information on the number of patients and treatment conditions through a disaster and rescue-medical information system covering a wide area in a speedy manner, to send needed assistance.

b. Dispatching Medical Teams External to Affected Area

- Affected local governments will promptly request medical aid troops through medical institutions and the upper disaster management authorities (F/G/S/PDMAs and NDMA) upon need.
- The Ministry of Regulations and Services, Pakistan Red Crescent, DDMA outside affected areas, F/G/S/PDMAs and NDMA shall establish a medical aid team with needed medical doctors and further request troops and teams from public and private medical institutions, upon need.
- Pakistani Armed Forces shall establish and dispatch medical aid troops upon request.
- NDMA, F/G/S/PDMAs, Pakistani Armed Forces, National Police Bureau, Pakistan Navy, Rescue 1122 and Civil Defence shall support medical aid troops.
- Medical institutions that formed medical aid troops will need to put effort into reporting such formation to the NEOC, F/G/S/PEOCs and DEOCs.
- F/G/S/PDMAs with DDMA administrating affected region/areas will be responsible for coordinating medical aid troops from the province and neighboring provinces. Further, they are responsible for selecting locations for medical activity in coordination with NDMA.
- NEOC and F/G/S/PEOCs shall comprehensively coordinate to dispatch medical aid troops based on needs and requests from each agency.
- Ministries, departments and agencies related to emergency transportation (NHA, etc.), Pakistani National Armed Forces, National Police Bureau, Pakistan Navy, Rescue 1122 and Civil Defence shall put effort into securing emergency transportation with priority based on needs and requests from federal and provincial Ministries of Health, Pakistani Red Crescent, and other related local government agencies.

6.3.5 Securing Transportation Network and Function for Emergency Transportation Activities

- National Police Bureau, Provincial/District Police, local governments and NHA shall need to coordinate and make efforts to control traffic during the disaster.
- Immediately after the disaster, road management bodies, such as NHA and local governments, shall need to put effort into implementing road rehabilitation in association with Pakistan Armed Force under the coordination of NDMA through NEOC.

1) Basic Strategy on Securing Transportation Network and Function for Emergency Transportation

- Traffic regulation, urgent rehabilitation and transporting activities need to take into account damage conditions, urgency, and importance when transportation and urgent transport activities are to be implemented.

2) Securing Transportation Network and Function

- Traffic control, such as prohibiting public use of roads, will be immediately enforced to secure traffic/transportation routes for emergency transportation, particularly at the initial stage after the rain or storm disaster occurrence. Personnel and equipment needed for urgent rehabilitation will be provided based on priorities, consequently.

3) Transporting in an Emergency

- Agencies related to emergency transportation (NDMA, F/G/S/PDMAs, NHA, provincial Ministries of Transport) and local governments will comprehensively and proactively implement emergency transport by utilizing all means by land, sea and air. Particularly, the use of both helicopters that having flexible mobility and sea vessels that have the capacity for mass transportation, will mainly be promoted for use in an emergency.
- NEOC and F/G/S/PEOCs will comprehensively coordinating and developing plans for emergency transportation system while requesting emergency transporting activities to ministries/departments and agencies related to emergency transport, based on needs or requests from affected local governments.
- NHA and provincial Ministries of Transport will request transportation corporations of air, road, sea, and railways for emergency transportation, based on needs or requests from command posts and affected local governments.
- Pakistan Army, Navy and Air Force will contribute to emergency transportation by operating their vessels and aircraft based on needs and requests from NDMA and F/G/S/PDMAs and affected local governments.
- Pakistani Armed Forces, National Police Bureau, Pakistan Navy, Rescue 1122 and Civil Defence will request emergency transport to agencies related to fire extinguishing based on needs and requests from command posts and affected local governments.
- Local governments will implement emergency transportation by themselves while requesting urgent transportation from agencies related to transportation and NDMA, F/G/S/PDMAs.

4) Securing Fuel

- Agencies related to emergency transportation and the federal Ministry of Petroleum & Natural Resources with provincial Ministries of Power and related agencies to mineral resources will plan and prepare fuel procuring and the supply system during the disaster.

6.3.6 Activities on Evacuation Centres

- Securing temporary residences until the time when the affected victims can find safe living places or until the time when their residences are rehabilitated will relieve the anxiety of disaster victims. Further, preparing measures to recover, such as providing temporary housing, is inevitable as the first step toward the restoration of livelihoods of the affected victims.

1) Leading Evacuation of Residents

- After the occurrence of a disaster, local governments shall lead the evacuation of residents, taking into account that securing the lives of residents is the first priority.
- When leading the evacuation, local governments shall need to put effort into disseminating various information on evacuation sites, evacuation routes, high-risk areas from disasters, an outline of damage and other related matters that helps smooth evacuation.

2) Managing Evacuation Sites

- DDMA will establish evacuation sites upon need by taking into consideration safety against floods, high tide/storm surges due to cyclones and sediment (landslide) disasters, while distributing such information thoroughly to residents in cooperation with F/G/S/PDMAs. F/G/S/PDMAs and DDMA will also employ additional facilities as evacuation sites after confirming their safety from disaster under agreements with facility managing bodies, besides the ones that were originally designated. In addition, F/G/S/PDMAs and DDMA will need to put effort into establishing various evacuation sites, including facilities located outside of affected areas, by renting hotels and possible local accommodations, to provide better care for vulnerable groups (e.g., elderly, handicapped, infants and pregnant women).
- DDMA will properly manage each evacuation site. F/G/S/PDMAs and DDMA will need to put effort into distributing information, food, water and cleaning supplies, in cooperation with evacuees, residents and community disaster management Organizations. In light of this, DDMA will request cooperation from other local governments, NDMA and F/G/S/PDMAs if needed.
- DDMA will need to put effort into collecting information on evacuees at each evacuation sites, as soon as possible and convey all information to NDMA and F/G/S/PDMAs.

- DDMA will need to put effort into paying attention to the living conditions at evacuation sites to keep the conditions comfortable. If the evacuation period is prolonged, DDMA will pay more attention to aspects such as keeping privacy and taking into account the various needs for people of different genders.
- DDMA will need to put effort into closing evacuation sites at early stages to secure the healthy livelihoods of victims, through providing different housings as temporary housing, available public housing and vacant homes in the private sector in collaboration with NDMA and F/G/S/PDMAs.

3) Temporary Shelters and Other Housing

a. Providing Temporary Shelters by Affected Provincial Government

- If construction of temporary housing is needed after the disaster, DDMA and F/G/S/PDMAs will construct temporary housing based on a discussion with relevant provincial agencies (e.g., Ministries of Public Health, Social Welfare, Rehabilitation, Civil Defence) with NDMA in a speedy manner to secure the healthy livelihood of evacuees. However, secondary disasters should be averted upon construction of such housing. DDMA and F/G/S/PDMAs will also administer the relocation of disaster victims to temporary housing, while promoting its smooth operation in association with NDMA.

b. Procuring Equipment needed for Constructing Temporary Shelters

- DDMA and F/G/S/PDMAs of affected district and provincial governments will request procurement of needed construction materials and equipment for temporary housing to relevant ministries and departments (e.g., Ministries of Irrigation, Transport, and other ministries related to public works) when the damage is large-scaled and beyond their capacities.
- DDMA and F/G/S/PDMAs will request relevant provincial agencies and NDMA will also request federal agencies to procure materials and equipment if needed.
- Federal and provincial agencies that received requests will decide on measures to take and respond to NDMA and affected F/G/S/PDMAs and DDMA.
- Based on the decision of agencies of which measures should be taken, their relevant agencies will distribute materials and equipment in response to requests.

c. Accommodating Wide-Area Evacuation

- Depending on the situation of evacuation and acceptance of disaster victims, affected DDMA and F/G/S/PDMAs will request cooperation for wide area evacuation cooperation via NDMA to relevant federal departments and agencies (e.g., Pakistani Armed Forces,

National Police Bureau, Pakistan Navy, and Ministry of Regulations and Services).

- NDMA (NEOC) will prepare a wide-area evacuation plan using comprehensive viewpoints. Contents of the plan will be presented and instructed to DDMA and F/G/S/PDMAs with related departments and agencies taking necessary measures for the preparation of wide-area evacuation.
- F/G/S/PDMAs and DDMA will properly implement all evacuation activities based on the plan in collaboration with related departments and agencies in accordance with the directions of NDMA.

d. Caring for Population of Vulnerable Groups

- It is inevitable that F/G/S/PDMAs and DDMA in collaboration with health-related agencies must take full care of afflicted people who are vulnerable, e.g., elderly, handicapped, infants and pregnant women, upon leading the evacuation, ensuring comfortable living conditions at evacuation sites, and enabling acceptance to temporary housing. Consequently, particular effort will be made on items such as health checks at evacuation sites, priority accommodation to temporary housing, and temporary housing construction for the elderly and handicapped. Further, information will need to be distributed in a particular manner to those who are vulnerable.

6.3.7 Activities on Provision of Food, Water and Daily Commodities

- Relevant agencies will operate, procure, keep, supply and distribute food, water, blankets and goods inevitably needed for daily life in order to maintain the disaster victims' health, in accordance with the policies.

1) Coordination by NEOC

- NEOC, in addition to procurement, comprehensive coordination, and planning, will require relevant agencies to provide goods when it is considered necessary and/or requested by local governments of affected areas.

2) Providing Commodities by Local Governments

- DDMA and F/G/S/PDMAs of affected areas will promptly provide goods they have procured and goods handed over by federal governments (NDMA, etc.) and other local governments to disaster victims.
- DDMA and F/G/S/PDMAs of affected areas and each relevant federal government agency will be required to provide goods to NDMA, who is responsible for the coordination of procurement of goods, if necessary.

3) Activities of Relevant National Government Agencies Responsible for Providing Goods

- NDMA, F/G/S/PDMAs and DDMA will make a request to relevant water supply corporations and ensure the supply of water to affected areas.
- Federal and provincial Ministries of Health, if considered necessary, or based on a request from NDMA or F/G/S/PDMAs of affected areas, will ensure the supply of medical goods to affected areas, with the cooperation of relevant Organizations or related business circles.
- The federal Ministry of Social Welfare and Special Education and provincial Ministries of Social Affairs, if considered necessary, or based on a request from NDMA or F/G/S/PDMAs of affected areas, will ensure the supply of food obtained by the related governments as well as with the cooperation of relevant Organizations or related business circles, to affected areas.
- The federal Ministry of Social Welfare and Special Education and provincial Ministries of Social Affairs, if considered necessary, or based on a request from NDMA or F/G/S/PDMAs of affected areas, will ensure the supply of essential commodities for living to affected areas in cooperation with relevant Organizations or related business circles.
- The federal Ministry of Communications and provincial Ministries for Information Technology, if considered necessary, or based on a request from NDMA or F/G/S/PDMAs of affected areas, will ensure the supply of communication equipment in cooperation with relevant Organizations or related business circles.
- F/G/S/PDMAs and provincial Ministries of Transport in association with NDMA and the Ministry of Communications (NHA) will ensure the priority usage of transportation means for transport of such goods to affected areas.

6.3.8 Activities on Sanitation, Health, Epidemic Prevention, Treatment of Human Remains

- Activities for maintaining good health conditions of disaster victims at the affected area will be well considered. In particular, much attention shall be given to the sanitary conditions of evacuation centres. In case of damage caused by a big disaster where a large number of people have suffered, burial of the dead will be promptly done without any delay.

1) Sanitation

- In order to maintain sanitary conditions and a good living environment at evacuation centres, DDMA and F/G/S/PDMAs cooperating with related provincial ministries or departments will promptly provide temporary toilets as required, take measures for cleaning the centres and providing treatment of human and domestic waste.

2) Public Health

- The provincial Ministry/Department of Health, DDMA's and F/G/S/PDMA's will continuously need to put efforts into maintaining good health conditions of people in the affected areas, especially for evacuation centres, since disaster victims will have a high possibility of a decline in their physical health due to the drastic changes in their daily life and environment. Health conditions of victims will be well comprehended, and relief centres will be provided according to the needs.
- The physical health condition of elderly people and disabled people who need extra care should be specially taken into consideration. Hospitalization of such victims into welfare facilities, dispatching caregivers and providing wheelchairs will be conducted in an orderly manner according to plans in cooperation with welfare service corporations and volunteer Organizations.
- DDMA's and F/G/S/PDMA's will conduct perambulate health consultation by health professionals.
- The provincial Ministry/Department of Health, according to needs or requirements of DDMA's and F/G/S/PDMA's of affected areas, will coordinate activities regarding health including planning of dispatching health professionals.
- The provincial Ministry/Department of Health, as needed or upon request of DDMA's and F/G/S/PDMA's of affected areas, will coordinate to ensure cooperation is extended by local governments of other areas.

3) Psycho-Social Aspects

- The provincial Ministry/Department of Health and DDMA's and F/G/S/PDMA's will continuously need to put effort into maintaining good health conditions of the people in the affected areas, especially for evacuation centres, since disaster victims will have a high possibility of upsetting their mental health due to drastic changes in their daily life and environment. Mental health conditions of victims will be evaluated, and relief centres will be provided according to the needs.
- Mental health conditions of elderly and disabled people who need extra care should be specially taken into consideration. Hospitalization of such victims into welfare facilities, dispatching caregivers and providing wheelchairs will be conducted in an orderly manner according to plans in cooperation with welfare service corporations and volunteer Organizations.

4) Epidemic Prevention

- NDMA, as deemed needed or upon request of F/G/S/PDMAs of the affected areas, will request the federal Ministry of Regulations and Services and Pakistan Army regarding operation of epidemic prevention, and conduct comprehensive coordination of the activities.
- The provincial Ministry/Department of Health, DDMA and F/G/S/PDMAs will ensure epidemic prevention by sterilizing in and outside of houses as deemed necessary.
- The federal Ministry/Department of Health will support epidemic prevention activities of local governments of affected areas through provision of medical goods and dispatch of professionals in epidemic prevention by requesting cooperation extended by other local governments.
- The Pakistan Army will, if deemed needed or upon request, conduct epidemic prevention.

5) Treatment of Human Remains

- Regarding the treatment of human remains, DDMA and national and local police bureau/offices will promptly conduct "Disaster Victims Identification." DDMA, in coordination with the Ministry of Religious Affairs, will collect information on crematories and coffins available in broader areas, and arrange the provision of coffins and transport of dead. If deemed necessary, local government (DDMA and Revenue Offices) will conduct cremation and/or burial over broad areas in cooperation with neighboring other local governments. Sanitary conditions for the dead will be considered.

6.3.9 Activities on Safety Control and Stabilization of Commodities Price

- Maintaining social order is one of the most important tasks; since it is considered that social chaos and psychological commotion often occur in affected areas. Also, relevant agencies and Organizations need to take appropriate measures to stabilize of goods prices and the supply of necessary goods for reconstruction of disaster victim's lives.

1) Safety Control

- Local police officers under direction and with cooperation of the National Police Bureau, or in cooperation with anticrime voluntary Organizations, will conduct patrols in the affected areas and vicinities including coastal areas, provide information regarding safety for life, and promptly make efforts to ensure safety.
- Pakistan Navy and Army will deploy patrol boats offshore of the affected areas and promptly make efforts to ensure safety.

2) Stabilization of Commodity Prices and Commodity Supplies

- Federal governments (Ministry of Economic Affairs & Statistics, etc.) and local governments will watch the situation and prevent the steep rise of prices, buy-up, and withholding of essential commodities of life.

6.3.10 Temporary Recovery Activities on Buildings, Utilities and Others

- Recovery of facilities and lifeline infrastructure will be promptly conducted. These include telecommunication systems and facilities for prompt and smooth emergency response, land conservation facilities for preventing secondary and repeated disasters, and those for life activities of disaster victims.

1) Emergency Recovery Activities of Facilities and Utilities

- NEOC (NDMA), F/G/S/PEOCs and DEOCs, immediately after the occurrences of disasters, utilizing specialists having relevant expertise, will need to promptly check facilities and utilities under each agency's management and control, figure out the extent of damage, and put efforts for prompt and smooth recovery of those facilities and lifeline infrastructure by preventing secondary disasters, as well as ensuring life activities of disaster victims as the top priority.

2) NEOC's Role Regarding Lifeline Facilities

- NEOC, F/G/S/PEOCs and DEOCs will request emergency response support to lifeline corporations through relevant government agencies such as the Ministry of Communication, Ministry of Information & Broadcasting, Ministry of Housing & Works, Ministry of Petroleum & Natural Resources and Ministry of Water & Power, if deemed especially necessary, considering the magnitude of the disaster and the importance of facilities.

3) Activities on Emergency Response for Recovery of Housing

- F/G/S/PDMAs, DDMA and related departments in cooperation with housing corporations, if needed, will need to put efforts into emergency repair of damaged houses in accordance with related guidelines.

6.3.11 Activities on Distributing Appropriate Information to Disaster Victims

- It is important to disseminate appropriate and accurate information to people in the affected areas. This provides citizens with protection from social ferment caused by wild rumors, stabilizes public sentiment, and helps people's appropriate judgment and actions in the affected areas. Proper systems of disseminating information will be developed to respond to inquiries, requirements, and opinions in large numbers by residents.

1) Activities on Information Dissemination to Disaster Victims

- NEOC, responsible relevant government agencies, public agencies, as well as F/G/S/PEOCs and DEOCs, in responding to the needs of disaster victims, will disseminate appropriate, accurate and careful information on (1) weather conditions, (2) damage conditions, (3) possibility of secondary disasters, (4) people's safety, (5) recovery situation of lifelines or transportation facilities, (6) life related information such as medical facilities, and (7) responding activities by each agency or Organization to the disaster victims for their use. On such occasion, the dissemination shall especially consider aged people, disabled people and foreigners.
- NEOC, responsible relevant government agencies, public agencies, as well as F/G/S/PEOCs and DEOCs will communicate among themselves on the information contents when they are released and disseminated to the public.
- An effort will be made to provide a window, such as on a portal site of the Internet, cell phones or landlines, in order to enable people to get comprehensive information.
- Dissemination of information shall be done, not only with signboards, public relations brochure or magazines, and public relation cars, but also with the cooperation of mass media such as broadcasting corporations, telecommunication corporations, and newspaper corporations. In order to respond to the needs of people who require getting accurate information on somebody's safety, operation of transportation, and so on, an effort will be made to provide such information in cooperation with Internet portal providers. Also, NEOC (NDMA), in cooperation with broadcasting corporations, will need to make efforts to diffuse systems that automatically operate broadcasting of TV and radio during emergency occurrences.
- In addition, NEOC and F/G/S/PEOCs and DEOCs, if deemed required, in cooperation with public agencies and relevant Organizations, shall set up a locally based "local information station" near the affected areas, which will collect, manage, and disseminate all information over a wide area to relevant agencies and residents.

2) Dissemination of Accurate Information to Residents

- NEOC, responsible relevant government agencies, public agencies, as well as F/G/S/PEOCs and DEOCs will actively disseminate required information to the entire population of the nation regarding the weather conditions, damage conditions, people's safety, the recovery situation of transportation facilities, and handling of donated goods.

- NEOC, responsible relevant government agencies, public agencies, as well as F/G/S/PEOCs and DEOCs will exchange information with each other when they release and disseminate information to the public.
- At the dissemination of information, cooperation of broadcasting corporations, telecommunication corporations, newspaper corporations, and so on, is to be extended. In order to respond to the needs of people who require getting information at any time on somebody's safety, operation of transportation systems, and so on, an effort will be made to provide such accurate information in cooperation with Internet portal providers.

3) Response to Inquiries of Residents

- NEOC, responsible relevant government agencies and F/G/S/PEOCs and DEOCs, if deemed necessary, will make efforts on promptly providing an information Organization stationed with staff with telephone sets for exclusive use of responding to inquiries by residents.

6.3.12 Activities on Preventing Secondary Disasters

- Disasters expand sequentially in many cases for rain and storm disasters; thus, emergency response activities to minimize this damage will lead to a reduction in damage volume. Emergency response measures will be needed to cope with secondary disasters caused by damage of embankments and floating debris or trees felled by winds.

1) Measures for Further Flood, Secondary Sediment (Landslide) Disasters

- NDMA, F/G/S/PDMAs and FFC will coordinate and instruct the implementation of drainage works for stagnant water to be executed by related agencies (PIDs and Pakistan Army) to reduce damage in cases where inundation occurs, upon need.
- NDMA, F/G/S/PDMAs and FFC will coordinate and instruct the implementation of emergency recovery works for damaged flood protection bunds and facilities to be executed by related agencies (PIDs and Pakistan Army) to prevent flood disaster spread.
- NDMA and F/G/S/PDMAs, in cooperation with GSP and other technical agencies, will mobilize experts to implement safety assessment in high-risk areas for sediment disasters to prevent and reduce sediment disasters that may have been caused by the rainfall. High-risk areas for sediment disasters that are identified by the assessment will be conveyed thoroughly to relevant agencies and residents to allow them to prepare and implement proper emergency measures, such as warning and evacuation systems.
- NDMA and F/G/S/PDMAs will coordinate and instruct the implementation of a site survey by the experts to understand damage situation and possible damage expansion quickly after sediment disasters in association with GSP. Emergency recovery works, such as removal of unstable soils and construction of urgent protection walls will be implemented if needed.

2) Building Damage

- As for building and housing collapse induced by secondary floods or high waves, NDMA, F/G/S/PDMAs and DDMA will instruct the implementation safety assessment promptly for both damaged buildings and residential lands by mobilizing experts. Necessary measures will be taken, e.g., urgently rehabilitating damaged facilities upon need or lead evacuation if continuous residence is deemed dangerous based on the results of the assessment.

3) Measures for Further Cyclones and Storm Surges

- NDMA, F/G/S/PDMAs and DDMA will coordinate to check coastal protection facilities to prevent inundation from high waves, storm surges or changes of tidal levels in preparation for the next onslaught of cyclone and storm surges. Urgent measures, including urgent recovery works as well as proper warning and evacuation systems will be established, upon needs. In cases where disaster occurrence is highly expected, evacuation measures will be implemented quickly.

4) Measures for Secondary Disasters by Explosive and Toxic Substances

- Managing bodies of hazardous facilities that may cause fire, such as petroleum and chemical plants, will check and evaluate the safety of their facilities and undertake necessary urgent recovery works to prevent secondary disasters like explosions. In cases where an explosion is highly expected, warnings will be quickly delivered to relevant agencies.
- NDMA, F/G/S/PDMAs and DDMA as well as private corporations need to take measures such as facility inspections, urgent recovery works, information distribution to relevant agencies, and environmental monitoring to protect leakage of toxic substances.

6.3.13 Accepting Support from Volunteers and Domestic/International Aid

1) Accommodating Volunteers

- NDMA, F/G/S/PDMAs, and DDMA as well as relevant agencies shall collaborate to assess the needs of affected areas and make efforts to support volunteer activities. Special attention shall be paid on making effective use of volunteer's abilities.

2) Accepting Relief Goods

- Local governments shall prepare a list of necessary relief goods and disclose its contents through NDMA, Civil Defence and mass media. Based on the actual experiences of need conditions of the affected areas, the list of relief goods shall be updated. NDMA, F/G/S/PDMAs, and DDMA shall establish inquiry counters for relief goods if needed. Citizens and private corporations that are donating relief goods need to make efforts to send relief goods that are needed in affected areas.

3) Accepting Donations

- Local governments shall organize donation accepting bodies and distribution committees. Use of donations shall be determined based on in-depth discussion by the relevant agencies.
- If foreign donations are offered through diplomatic routes, the Foreign Affairs Division shall inform details on the type of donation, such as volume, time and date of arrival and place to deliver. NDMA, in association with the Foreign Affairs Division, shall make a plan for distribution of donations based on the response strategy.
- NDMA shall discuss the field of assistance with multi- and bilateral donor agencies in response to disaster.

6.4 Post-Disaster Measures

6.4.1 Post-Disaster Measures

- Rehabilitation and reconstruction of affected areas shall be prepared based on two factors: 1) to promote recovery from disaster, and 2) to promote reconstruction with higher resiliency to disaster. This shall be achieved through supporting restoration of livelihoods of the affected people and rehabilitating facilities with efforts on preventing future damage from disasters. Further, prompt implementation of rehabilitation and reconstruction are essential to recover social and economic activities as in normal circumstances.
- In this regard, practical manual(s) of recovery and reconstruction from meteorological disasters shall be prepared taking into account a livelihood support system.

6.4.2 Deciding Fundamental Orientation of Rehabilitation and Reconstruction

- With support from NDMA, F/G/S/PDMAs and DDMA, local governments shall promptly discuss with affected people and show the basic orientation of rehabilitation and reconstruction by taking into account damage conditions, regional characteristics, and the intentions of the relevant managing bodies of public facilities.
- All related national governments, in accordance with their roles and responsibilities, shall provide affected local governments with technical and financial support for rehabilitation and reconstruction through fiscal and financial measures as well as necessary human resources.
- Affected local governments shall request the national government and other local governments to dispatch officers and other support to promote recovery and reconstruction, if needed.
- In this connection, NDMA and F/G/S/PDMAs shall promote the system of establishing a coordination meeting for meteorological disasters in accordance with the direction of the Chairman of NDMA.

6.4.3 Procedures on Prompt Rehabilitation to Pre-Disaster Conditions

1) Rehabilitating of Damaged Public Facilities

- With support from NDMA, F/G/S/PDMAs and DDMA, public agencies and FFC shall implement recovery of affected public facilities based on the pre-designated rehabilitation plan.
- The national government shall need to put effort into administrative support to simplify the procedures for implementation of rehabilitation and recovery of lifeline facilities.
- NDMA, F/G/S/PDMAs and DDMA as well as public agencies and FFC shall need to put effort into improving the affected facilities to minimize future disasters in rehabilitation.
- NDMA, F/G/S/PDMAs and DDMA shall provide effort on measures to avoid secondary disaster of damaged facilities located in the area where land has become unstable after the disaster.
- Agencies and departments related to lifeline and road transportation shall need to put effort into providing information on re-operation of facilities and roads during the rehabilitation period.
- All of the efforts regarding rehabilitations activities shall be publicized as integrated information from NDMA and F/G/S/PDMAs.

2) Treatment of Debris

- Local governments shall establish a plan to remove debris from affected areas, including lands for temporary placement and final disposal sites as a part of rehabilitation and Reconstruction Plan(s), so that collection, transportation and final processing of debris shall be appropriately implemented.
- The Ministry of Disaster Management of the provincial government shall provide support for treatment of debris in a proper manner, including segregation of debris into recyclable and disposable items.
- Debris shall be processed in an appropriate manner to prevent environmental degradation and to manage the health of both local residents and laborers in reconstruction work.

6.4.4 Procedures on Planned Reconstruction

1) Formulating Reconstruction Plan

- A Reconstruction Plan shall be needed in places that are damaged from the disaster. The Reconstruction Plan shall include social, economic and physical aspects. Consequently, the Reconstruction Plan shall be prepared by local governments in coordination with relevant agencies.

- Local governments shall take the initiative to prepare and implement the Reconstruction Plan promptly after a disaster. The national government shall support local governments to institutionalize planning and implementation of reconstruction. In this regard, NDMA shall prepare the guidelines and policies for the Reconstruction Plan.

2) Developing Cities Safe from Disasters

- Local governments shall prepare recovery and Reconstruction Plans in damaged areas to minimize future disasters through securing the safety of residents. In this regard, the recovery and Reconstruction Plan needs to envision the future of the city by ensuring participation of the residents in the planning process.
- Local governments shall aim to improve the security of urban areas damaged from disasters in the Reconstruction Plan. In this regard, open spaces, including urban parks and riversides, are not only used for recreational purposes but also for the purpose of evacuation sites and emergency routes for transportation in case of disasters. Such aims shall need to be shared with local residents to prepare the Reconstruction Plan.
- Local governments shall identify buildings constructed without safety regulations and standards. This information shall be applied to the Reconstruction Plan.
- Health division(s) in local governments shall be responsible for providing measures to prevent degradation of health for people who work in rehabilitation and reconstruction activities in the affected area. They shall establish counseling counters to prevent accidents at work and to take care of laborer's health management.

6.4.5 Assisting Livelihood Restoration of Disaster Victims

- The Social Welfare and Special Education Division and local governments shall give condolence and consolation and provide loans to support disaster-affected victims in their livelihood restoration.
- NDMA and local governments shall support livelihood restoration of victims by providing a fund designated in law related to disaster recovery and reconstruction. Consequently, local governments shall establish a system for issuing certificates to victims affected by the disaster to make the recovery process efficient.
- NDMA, F/G/S/PDMAs and DDMA shall need to take relief measures for victims, such as: 1) postponing or exempting tax payments, 2) reducing or exempting medical expenses caused by the disaster, and 3) reducing or exempting insurance fees.
- The Labor & Manpower Division shall need to take measures to secure jobs for victims in the affected area.

- Agencies related to housing finance shall provide the victims with financial aid to support reconstruction of their houses damaged by the disaster.
- The Pakistan Public Works Department and local governments shall provide special measures to allow disaster victims who lost their houses to reside in public housing for a certain period of time until recovery of their livelihoods.
- The Department of Public Works and local governments shall promote relocation of victims from damaged areas to less hazardous areas, by establishing a special relocation promotion Program for disaster prevention.
- Local governments shall provide disaster victims with temporary shelter during the reconstruction period.
- NDMA, F/G/S/PDMAs and DDMA shall disseminate information on rehabilitation and reconstruction programs to support disaster victims.
- Local governments shall need to establish a special recovery fund to promote self-support of disaster victims.

6.4.6 Assisting Reconstruction of Small and Medium-Sized Enterprises and Economic Recover

- Financial institutions shall provide business owners and enterprises damaged by disaster with disaster reconstruction loans to recover and reconstruct their business.
- NDMA, F/G/S/PDMAs and DDMA shall need to take special measures on economic recovery in affected areas, such as infrastructure improvement, and recovery measures for local industry.
- NDMA, F/G/S/PDMAs and DDMA shall need to disseminate information on financial support for local economic recovery.

Chapter.7 Disaster Management Measures in Industrial Hazards (Reference)

7.1 Introduction

The chapter outlines the introduction, mitigation and preparedness measures, emergency response measures and post-disaster measures for hazardous materials related disasters.

7.2 Pre-Disaster Measures

7.2.1 Safety Assurance of Hazardous Materials Related Institutions

- Business enterprises that store and/or handle hazardous materials (called business enterprises hereafter in this section) shall comply with the technical criteria, which are stated in laws and articles. Also, the national government and local governments shall fully enforce on-site inspections so that the safety of the institutions is assured.
- National and local governments and business enterprises shall promote the arrangement of self-help systems through complying with self security preservation regulations, installing a community Organization for fire fighting, and enforcing periodic inspections or self inspections.
- Business enterprises in the special disaster management areas such as petrochemical complexes shall allocate facilities appropriately from the viewpoint of disaster management.
- Business enterprises in the special disaster management areas such as petrochemical complexes shall establish a self-help Organization for disaster management and install equipment for disasters, conduct disaster management education and training, and establish specific disaster management institutions such as retaining banks for spilled oil.
- Business enterprises in the special disaster management areas such as petrochemical complexes shall work to secure multiple routes for the fire-fighting Organization to reach and enter the site without any trouble in case of a disaster in the area.
- National governments and local governments shall allocate vegetated buffer areas in order to prevent the spread of any disasters that may happen in the special disaster management areas such as petrochemical complexes.
- Local governments shall make urban planning decisions regarding restricted industrial areas so that a mix of buildings for different purposes can be prevented.
- If any hazardous materials related disasters occur, NDMA, F/G/S/PDMAs, DDMA and the business enterprises shall work to complete investigations of the cause, and if the need arises

according to the investigation, shall seek to improve the security of hazardous materials related facilities by re-examining the technical criteria in the laws and regulations.

7.3 Emergency Response Measures

7.3.1 Collecting and Reporting of Information, Securing of Communication just after the Disaster

1) Collecting and Reporting of Information on Disasters

a. Reporting of the Information on Accidents Related to Hazardous Materials

- When a large-scale accident related to hazardous materials occurs, business entities shall contact DDMA, and then DDMA shall proceed to report to the ministries in charge of controlling handling of hazardous materials, such as the Ministry of Industry and Production, Ministry of Petroleum and Natural Resources and Ministry of Water and Power and Ministry of Defence.
- The ministries in charge of handling hazardous materials shall report to the Prime Minister's Office and relevant Organizations (NDMA, Pakistani Armed Forces, Ministry of Interior, Ministry of Disaster Management, etc.) with the information regarding the accident in case of large-scale accidents.
- The ministries in charge of handling hazardous materials shall include the necessary information in implementing emergency response measures such as the attributes of relevant materials or handling precautions when they disseminate accident related information.
- F/G/S/PDMAs shall forward the information, which they receive from the ministries in charge of handling of hazardous materials, to relevant local agencies.

b. Collecting and Reporting of the Initial Information just after Large-scale Disaster Related to Hazardous Materials

- Business enterprises shall report the damage situations to DDMA, and then DDMA will proceed to report the information to the ministries in charge of handling hazardous materials.
- The national government and the local governments shall conduct visual inspections and/or photographing from aircraft if necessary.
- DDMA of the disaster site shall collect the information on the current situation of human damage and on if there are any fires, and at the same time gather the general information on the scale of the damage. District governments shall then immediately proceed to

forward information to provincial governments.

- Provincial governments, besides collecting information from district governments, shall acquire the general necessary information on the extent of damage by themselves, providing this information to the Ministry of Defence and other related ministries if necessary. Also, the provincial police office shall collect information on the damage situation and inform the Ministry of Interior.
- If a hazardous materials related disaster happens that has a large-scale social impact, the relevant ministries shall report the initial information on the damage immediately to the Prime Minister's Office.

c. Gathering and Reporting of General Damage Information

- Business enterprises will report the damage situation to DDMA and the DDMA shall in turn forward the information they receive to the relevant ministries in charge of handling hazardous materials.
- DDMA shall gather the information on the damage situation and forward it to F/G/S/PDMA. Then, they shall report it to NDMA and the relevant ministries in charge of handling hazardous materials (Ministry of Defence, Ministry of Commerce, and Ministry of Regulations and Services), or after establishing NEOC, the Ministry of Defence will forward the information to NEOC.
- Designated public agencies shall collect information related to their operations, and forward it, directly or indirectly through designated public agencies, to NDMA, relevant ministries in charge of handling of hazardous materials and other relevant ministries. After establishing NEOC, the Ministry of Defence shall forward the information to NEOC.
- Designated public agencies shall collect information on the damage situation related to their operation, and forward it to the Prime Minister's Office, the relevant ministries in charge of handling of hazardous materials and other relevant ministries if necessary.

d. Reporting of Information on Emergency Response Activities

- Business enterprises shall contact the DDMA regarding the current situation of emergency response activities, and the DDMA shall then forward the received information to the relevant ministries in charge of handling hazardous materials.
- The victimized DDMA shall inform the F/G/S/PDMA on matters such as the progress of emergency response activities and establishment of NEOC, and whether outside assistance is needed. Also, F/G/S/PDMA shall report the current situation of the emergency response activities that they are conducting.

- F/G/S/PDMAs, through the designated public agencies, shall report the progress of emergency response activities and establishment of NEOC to the Prime Minister's Office, the relevant ministries in charge of handling hazardous materials and after establishing NEOC, to this EOC. If necessary, information shall also be provided to F/G/S/PDMAs and to the business enterprises.
- The Prime Minister's Office, the relevant ministries in charge of handling of hazardous materials and NEOC shall report the information gathered on emergency response activities to the Prime Minister if necessary.
- NEOC shall forward the information on emergency response activities that has been collected from other entities or arranged in EOC to the designated public agencies and F/G/S/PDMAs, if necessary.
- All the related agencies shall share information closely with each other on the emergency response activities if necessary.

2) Securing the Means of Communication

- The national government, local governments and the business enterprises shall, immediately after the occurrence of a disaster, secure the means of communication for exchange of disaster related information.
- At the time of a disaster, telecommunication companies shall preferentially secure the important communication lines of NDMA, F/G/S/PDMAs and DDMA.

7.3.2 Establishment of System for Action

1) System for Action of Business Enterprises

- Business enterprises shall take the necessary steps such as assembling staff, establishment of information collection and communication systems, and installation of EOC immediately in the aftermath of a disaster.
- Business enterprises shall take necessary measures immediately after a disaster in order to prevent its expansion.
- Business enterprises shall seek to secure close contact and cooperation with Civil Defence, Rescue 1122, community Organizations, and other agencies.

2) System for Action of Local Governments

- Local governments shall take the necessary steps immediately after a disaster such as assembling staff, establishment of information collection and communication systems, and DEOC such as those in petroleum complexes.

- Local governments shall seek to secure close contact and cooperation with designated public agencies.

3) System for Action of the Prime Minister's Office and Designated Public Agencies

- In case of a hazardous materials disaster with a large-scale social impact, NDMA shall establish NEOC, and intensively conduct its tasks such as summing up of information gathered, making reports to the Prime Minister, arranging contacts between relevant ministries, and making general arrangements for initial action as the national government representative.
- Designated public agencies shall work to secure close contact and cooperation between themselves and between public agencies, local governments and business enterprises.

4) System for Action of Public Agencies

- Public agencies shall take necessary steps such as assembling staff, establishment of information collection and communication systems and installation of NEOC.
- Public agencies shall work to secure close contact and cooperation between designated public agencies.

5) Wide Area Assistance System

- DDMA at the disaster site, depending on the scale of damage, shall call for outside help from other DDMA. Also, DDMA and business enterprises outside the disaster site area shall immediately arrange assistance systems when they recognize an occurrence of a large-scale hazardous material related disaster.

6) Holding of Communication Meetings between Relevant Ministries

- NDMA shall hold coordination meetings among relevant ministries. NDMA shall be held depending on need in order to confirm and share the primary information on the accident and its damage when a large-scale hazardous materials related disaster happens.

7) Gathering Teams for Emergencies and Holding Ministerial Councils

- If a hazardous materials related disaster with large-scale social impacts happens, the Prime Minister's Office shall gather emergency teams to the official residence and collect the information as the first motion of the national government.
- If necessary, the Chairman of NDMA shall hold emergency meetings with the Prime Minister and the relevant ministers to discuss basic policy on measures, the response system, and other important topics.

8) Establishment of NEOC

a. Establishment of NEOC and System for Action

- If an occurrence with large-scale damage is perceived based on the collected information, NDMA shall establish NEOC immediately.
- When the establishment of NEOC is determined, NDMA shall immediately execute the required procedures.
- The members of NEOC, except for the members of the DEOC, are to consist of chief level staff of designated public agencies such as the ministries in charge of handling hazardous materials.
- If a particular need is perceived to implement the emergency response measures precisely and promptly in the administrative area of NEOC, the head of the EOC shall give directions to the necessary extent to the heads of specified relevant local administrative agencies, the heads of local governments, and to other agencies.
- The head office of NEOC shall strengthen the frameworks depending on the extent of the damage.

b. Dispatch of Investigation Team of NEOC and Establishment of the Local Emergency EOC

- In order to grasp the situation of the disaster site and contribute to the prompt and precise implementation of the emergency response measures and the clarification of the cause of the accident, NEOC may dispatch investigation teams depending on needs. Also, among the administrative procedures related to general arrangement of emergency response measures implemented by the specified local administrative agencies and local governments, if there are any procedures that need to be handled on site, the emergency EOC may establish an on-site EOC.
- With the dispatch of government investigation teams, the officials in charge shall be urgently sent to the site by helicopters or other means depending on needs.

9) Securing of Staff related to the Disaster Management Area

- The national government and local governments shall secure the necessary equipment in order to assure security during the emergency response activities.
- The national government and local governments shall keep close contact and cooperate with each other to ensure security during the emergency response activities.

7.3.3 Activities for Preventing Expansion of the Disaster

- Business enterprises shall conduct precise emergency investigations and measures in the face of hazardous materials related disasters.
- Local governments shall take appropriate emergency measures, such as prevention of effusion and spread of the hazardous materials, removal of the spilled materials, environmental monitoring, evacuation of residents, provision of directions on emergent measures to the business enterprises, and provision of emergency stop order of hazardous materials related institutions.
- Immediately after a disaster, business enterprises in the special disaster management areas such as petrochemical complexes shall work to prevent the spread of the disaster.

7.3.4 Rescue, Medical and Fire Fighting Activities

1) Rescue Activities

a. Rescue Activities by Local Governments

- Local governments shall operate rescue activities, and depending on needs, call for outside assistance from NEOC, DEOC and other local governments.
- NEOC or the DEOC, if needed or requested by other agencies, shall arrange the general coordination in order to facilitate smooth and effective rescue activities.
- The Ministry of Defence shall take measures for wide-area assistance such as dispatch of emergency rescue teams if necessary.
- The Pakistani Armed Forces shall operate rescue activities if needed or requested by NEOC, F/G/S/PEOC and DEOC.
- The Coast Guard shall operate rescue activities at sea, and if possible, assist the activities of local governments or those requested by NEOC.

b. Procurement of Equipment

- Equipment necessary for the rescue activities shall basically be supplied by the agencies that implement them.
- The national government and local governments, if needed, shall procure the necessary equipment for the rescue activities through cooperation from private companies so that they can implement efficient activities.

2) Medical Activities

- Medical institutions shall operate medical activities for those who are injured, and in order to cope with the rapid increase of patients, they shall maintain close contact with each other and call for assistance from other medical institutions if necessary.
- The national government (Ministry of Regulations and Services and Cabinet Secretariat) and PRCS shall secure medical doctors to organize emergency groups, and if needed, request the dispatch of emergency medical teams from public or private medical agencies.
- The Pakistani Armed Forces shall organize and dispatch emergency groups based on requests.
- When emergency groups have been organized, the concerned medical institutions that have organized them shall report to NEOC.
- The DEOC, when needed or requested by local governments, shall make holistic arrangements for medical activities such as developing dispatch plans for emergency groups.
- NEOC, when needed or requested by local governments, shall make holistic arrangements related to the dispatch of emergency groups.
- Ministries concerned with emergency transport (i.e., Ministry of Communication, Coast Guard, Ministry of Defence, federal police), when needed or requested by the national government, PRCS and the local governments, shall pay special attention to the emergency transport of the emergency groups such as preferential securing of the means of transportation.

3) Fire-Fighting Activities

a. Fire-Fighting Activities by Civil Defence and Community Organizations for Fire Fighting

- Civil Defence, Rescue 1122 and community Organizations for fire fighting shall immediately grasp the situation of fire disasters, and quickly initiate fire-fighting activities.
- DDMA's outside the disaster site shall work to implement smooth and prompt assistance from Civil Defence, Rescue 1122 and community Organizations for fire fighting based on the request from the local governments of the disaster site or based on mutual help agreements.
- The local government shall make general arrangements of the measures necessary for the assistance from volunteers and community Organizations from outside districts.
- NEOC, when needed or requested by local governments, shall make general arrangements for assistance requests to other agencies.

b. Fire-Fighting Activities by the Coast Guard

- The Coast Guard shall operate fire-fighting activities at sea, and if possible, assist the activities of local governments if needed or requested by NEOC.

7.3.5 Emergency Response to Massive Effusion of Hazardous Materials

- In case of massive effusion of materials such as oil, the entity that caused the accident shall take measures for removal.
- Fire-fighting services and Rescue 1122 shall immediately operate removal activities and evacuation guidance activities in case of massive effusion of hazardous materials to the sea.
- The Coast Guard, in case of massive effusion of hazardous materials to the sea, shall operate emergency removal activities and take necessary steps for evacuation guidance for ships and vessels, and at the same time, if the entity that caused the accident is not taking necessary measures, order it to do so.
- The Coast Guard, in case of effusion of materials such as oil, shall call out oil recovery ships and operate oil removal activities if requested.
- The Coast Guard, in case of massive effusion of hazardous materials to the sea, shall take measures to minimize the damage by, for example, initiating removal activities independently.
- The national government and local governments, in case of massive effusion of hazardous materials to rivers, shall conduct necessary measures such as environmental monitoring or disposal of the hazardous materials, followed by immediate coordination with relevant agencies. In doing so, the national government and the local governments shall implement these measures promptly by utilizing the existing Organizations effectively.
- The national government and the local governments shall conduct necessary measures to cope with hazardous materials drifting ashore such as removal of the materials or environmental monitoring, followed by immediate coordination with relevant agencies.
- In operating removal measures, necessary equipment shall be procured promptly in order to minimize the spread of the hazardous materials.
- Business enterprises in the special disaster management areas such as petrochemical complexes shall prevent the effusion of the materials to the sea by utilizing oil booms, oil boom extenders and oil recovery vessels.

7.3.6 Evacuation and Accommodation Activities

1) Implementation of Evacuation Guidance

- In case of disaster, DDMA shall guide evacuation of residents in the area, putting the first priority on the security of human lives.
- In operating evacuation guidance, DDMA shall seek to provide information on areas and routes of evacuation, on where the hazardous spots are, on a broad picture of the disaster and other information that will contribute to evacuation.

2) Evacuation Area

a. Opening of the Evacuation Area

- DDMA shall open evacuation areas in the face of disasters, and make sure to announce them comprehensively to all residents. Also, if needed, the DDMA shall open evacuation areas in facilities that have not been assigned for an emergency use in advance, after security and permission from the person in charge are assured.

b. Management of the Evacuation Area

- DDMA shall conduct appropriate operational management in each evacuation area. In doing so, the local governments shall acquire cooperation from the evacuees, residents and community Organizations for information delivery, provision of food and water and cleaning at the evacuation areas.
- DDMA shall immediately acquire information on the evacuees accommodated by each evacuation area.
- DDMA shall pay attention to the living environment at the evacuation areas and keep it favorable.

3) Attention to People Needing Assistance

- In guiding the evacuation, considering the living environment at the evacuation areas and accommodation in temporary tents, adequate attention shall be paid to people needing assistance such as the elderly and the disabled. In particular, the health conditions of the elderly and the disabled shall be evaluated, and the elderly shall be preferably accommodated in temporary tents and emergency dwellings established especially for them. Also, sufficient attention shall be paid to information provision to those people needing assistance.

7.3.7 Emergency Rehabilitation Activities of Institutions and Equipment

- The national government and the local governments shall implement emergency investigations of the facilities and equipment, utilizing human resources with expertise, and grasp the damage situation to conduct emergency rehabilitation.

7.3.8 Precise Information Delivery to the Disaster Victims

1) Information Delivery Activities to the Disaster Victims

- NEOC, designated public agencies, local governments and business enterprises shall grasp the needs of the disaster victims adequately, and appropriately provide precise and detailed information that contributes to aid the victims; situations of the hazardous materials related disasters, risks of secondary disasters, safety of victims, restoration situations of public institutions such as traffic facilities, information on medical institutions, information on policies taken by each agency, and traffic regulations. Also, attention shall be paid to the people needing assistance such as the elderly, the disabled and foreigners.
- NEOC, designated public agencies, public agencies, local governments and business enterprises shall maintain contact with each other about the contents of the information to be published.
- Methods for information provision, such as portal websites, shall be established to enable people to acquire general information.
- Information delivery shall be conducted, not only through bulletin boards, publications, magazines and PR cars, but also through cooperation from mass media such as press agencies and newspaper companies.

2) Precise Delivery of Information to Residents

- NEOC, designated public agencies, DDMA and business enterprises shall proactively deliver information that is required for the entire population; such information includes the situation of the hazardous materials disaster, safety information, restoration situations of various facilities and handling of the donated commodities.
- NEOC, designated public agencies, DDMA and business enterprises shall maintain contact with each other about the contents of the information to be published.
- Information dissemination shall be conducted through cooperation with mass media such as broadcasting companies, press agencies, and newspaper companies. Additionally, in order to meet the demands for on time acquisition of information regarding the safety of specific individuals, traffic information, etc., precise information provision shall be sought by requesting cooperation, for example, from portal website companies.

3) Response to Inquiries from Residents

- NEOC, designated public agencies, DDMA's and business enterprises shall, if the need arises, install emergency telephone lines to respond to the residents' inquiries immediately after the disaster, and arrange the allocation of staff. Also, collection and summarization of information shall be done if needed.

7.4 Post-Disaster Measures

- The national government and local governments, utilizing the previously established plans on procurement of supplies and materials and plans for wide-area assistance through provision of human resources, shall implement rehabilitation activities of public facilities promptly and smoothly.
- In executing the rehabilitation, the national government and local governments shall set a due date for restoration if possible.
- In executing the rehabilitation, the national government and local governments shall take necessary measures with attention given to the environment.

Chapter.8 Disaster Management Measures in Biological Hazards (Reference)

8.1 Introduction

The chapter outlines emergency response measures and post-disaster measures for disease control.

8.2 Emergency Response Measures

8.2.1 Collecting and Reporting of Information on Disaster

- When a disaster has occurred or its potential risk is rising, the members of EOC shall forward the information collected from the Ministry of Interior, Ministry of Communication and other ministries to the Ministry of Regulations and Services immediately.
- If an emergency meeting is called, it shall assemble at NDMA as its member, and undertake the collection and delivery of related information.
- The Ministry of Regulations and Services shall, with or without orders from the outside, proceed to collect information related to its own administrative tasks and take necessary measures. If an emergency team is being called up, the Ministry shall support its activities, providing detailed information to it.
- The Ministry of Regulations and Services shall gather information directly from the province or district in which the disaster occurred, and other additional information by all possible means, such as visual information relayed from helicopters on television, information from mass media, direct communication on the phone to the disaster site or neighboring related facilities, and inquiries to private firms that have nationwide networks, and report this information to the head office of EOC.
- Following are examples of information that is to be submitted to the liaison and coordination conference based on the item above:
 - (1) The damage situation of facilities and operations that are under administration of the Ministry of Regulations and Services.
 - (2) The situation regarding first aid activities operated by PRCS and information on the local situation.
 - (3) Communication status between the local governments and other relevant agencies at the disaster site.
 - (4) Other important information collected from activities stipulated in the previous item.

- In addition, the relevant department of the Ministry of Regulations and Services shall, if needed, collect as much information as possible by sending staff members with mobile phones to the disaster site immediately after the disaster.

8.2.2 Establishment of EOC in Ministry of Regulations and Services

1) Establishment of EOC

- When a disaster occurs or its possible risk arises, EOC shall be established based on the decision of the Minister.
- EOC shall be designed appropriately according to the required response measures to be implemented, dependent on the kind of disaster, the features of the disaster area, and the season at the time of the disaster.

2) Spontaneous Assembly

- The members of EOC shall assemble immediately without waiting for directions from the person in charge of the assembly if an emergent disaster occurs or a potential risk for a disaster is noticed.

3) Operations of EOC

- EOC shall conduct the following operations:
 - (1) Summarization of the information on the damage situation gathered by the relevant departments of the Ministry of Regulations and Services.
 - (2) General management and arrangement of the emergency response measures.
 - (3) Information exchange and contact arrangement between EOC in the Ministry of Regulations and Services, NEOC and the relevant ministries.
 - (4) Provision of the information to the relevant departments of the Ministry of Regulations and Services collected from the emergency task force of the government or relevant ministries.
 - (5) Holistic arrangement of information activities such as periodic preparation of information materials on the damage situation and the emergency response measures.
 - (6) Communication with executives of the Ministry of Regulations and Services.
 - (7) Communication arrangements with EOC after it has been established.
 - (8) Other necessary operations for emergency response measures.

8.2.3 Dispatch of Staff Members

1) Dispatch of Staff Members

- In case an emergency disaster occurs, immediately after, particular staff members specified in the following list shall visit the damage site, collect information and arrange communications with F/G/S/PDMAs and DDMAAs.

- (1) Staff for gathering healthcare related information.
- (2) Staff in charge of emergency rescue administration.
- (3) Professionals for sanitation.
- (4) Other necessary staff for emergency response measures.

2) Operation of Ministry of Regulations and Services in Disaster Situation

a. Information Gathering and Comprehension

- Information shall be gathered mainly by the general administration division of the Ministry of Regulations and Services through local governments and other related agencies under directions from the relevant departments of the Ministry of Regulations and Services.
- The general administration division of the Ministry of Regulations and Services shall send staff to DDMAAs and assign them to "on-site contact persons" who work with information gathering if it is requested by the relevant departments of the Ministry of Regulations and Services.
- The on-site contact persons shall gather information not only from F/G/S/PDMAs or DDMAAs of the disaster site, but also from agencies such as local mass media, and report it to the Department of Health and Ministry of Regulations and Services.
- Staff in the Ministry of Regulations and Services who are in charge are supposed to visit the disaster site immediately after the occurrence of a disaster. When they arrive, the on-site contact persons sent from the Ministry of Regulations and Services shall forward all the information collected by that time to them and cooperate with them for further information gathering thereafter.

b. Major Items of Information to be Collected by the On-site Contact Persons

- The damage situation of the districts that suffered the disaster.
- The situation of emergency medical activities implemented by medical teams and information collected from these teams on the situation of the site.

- The situation of the rescue activities conducted by local governments, the Ministry of Defence and PRCS, and the information about the situation of the site that is collected from the PRCS and other Organizations.
- Other important information acquired through information collection activities.

c. Response to the Mass Media

- In responding to the mass media, adequate contact with the relevant departments of the Ministry of Regulations and Services shall be kept in order to prevent inaccuracy of information.

d. Arrangement of Communication Systems

- The Department of Health shall designate on-site contact persons from its staff in advance so that they are ready in case of disaster, and secure the information communication route from the on-site contact persons to the contact person at the Ministry of Regulations and Services and the person in charge at the Department of Health beforehand.
- As for the contact route from the Department of Health to the Ministry of Regulations and Services, the contact person at the Ministry of Regulations and Services shall be designated in advance, and the information communication route to each division of the Ministry of Regulations and Services shall be secured beforehand.
- On-site contact persons and the contact person at the Ministry of Regulations and Services shall be registered by the Ministry of Regulations and Services, and if there is any change, the registered information shall be amended.
- On-site contact persons and the contact person at the Ministry of Regulations and Services shall proactively attend disaster related meetings held by the Ministry of Regulations and Services or other entities, and work to collect information and knowledge even at normal times.

3) Information Activities at Times of Emergency Disasters

- When EOC in the Ministry of Regulations and Services is established, it shall be announced at a press conference immediately.
- The Ministry of Regulations and Services shall proactively provide precise and detailed information on the damage situation of their operations and facilities and on the measures and policies they are currently taking to mitigate this damage.
- The Public Relations Office, the general administration division of the Ministry of Regulations and Services shall, in the face of a disaster, pay attention to the arrangement of contacts with

the relevant departments of the Ministry of Regulations and Services so that press conferences on the disaster status can be held sequentially.

- The Statistical Information Department of the Ministry of Regulations and Services shall provide the details of press conferences through its website.

8.2.4 Implementation of Rescue Activities

1) Establishment of Evacuation Areas

- Once evacuation areas are installed, F/G/S/PDMAS of the disaster site that installed them shall grasp the status of the areas by counting the numbers of evacuees and making name lists, secure necessary institutions and equipment such as televisions, radios and temporary lavatories, and if necessary, pay attention to privacy protection when evacuation is prolonged.
- DDMA of the disaster site, with cooperation from the evacuees, shall grasp the location of people needing assistance such as the injured, disaster orphans, the weakened elderly and disabled people, and arrange contact with them so that they can receive necessary health and welfare services.
- F/G/S/PDMAs of the disaster site shall conduct a needs survey for the people requiring assistance at the evacuation area such as the disabled and the elderly, and if needed, rent and utilize public accommodation facilities for them.

2) Provision of Food and Beverages

- DDMA of the disaster site shall provide food and beverages with cooperation from business enterprises. If it is not possible to prepare them immediately, they shall provide sea biscuits or canned foods.
- DDMA of the disaster site shall figure out the required amount of food supply based on the information from the person in charge of evacuation areas, operate soup lines by utilizing the cooking facilities in public institutions, and arrange for delivery of foods by food distribution enterprises.
- DDMA of the disaster site, if needs are recognized based on the scale of the damage, shall immediately arrange systems for food provision with cooperation from the victimized residents.

3) Advisory and Other Assistances

- The Ministry of Regulations and Services shall give necessary advice and other assistance in order for the measures written above to be conducted appropriately, and provide assistance needed for the following steps as stipulated in the Acts to be operated properly: rescue of the

people that suffered from the disaster, provision of medical care, search, treatment and burial of dead bodies, provision of necessities and school supplies, temporary repair of residences, removal of obstacles and other emergency measures.

8.2.5 Arrangements of Operation Frameworks

- If the required amount of workforce cannot be secured from the staff of the DDMA of the disaster site, the DDMA shall ask for assistance from neighboring F/G/S/PDMAs or request the Minister of Health for an announcement of an assistance order if needed.
- The Ministry of Regulations and Services shall arrange the appropriate assistance frameworks such as dispatch of necessary staff based on the requests of the district that suffered the disaster.

8.2.6 Cooperation with Relevant Ministries

- The Ministry of Regulations and Services, in order to contribute to the smooth rescue activities as stipulated in the Acts, shall have close contact with relevant ministries and agencies in securing food and equipment and in procuring building sites for the emergency temporary tents.

8.2.7 Measures Regarding Medical and Health Care Activities

1) Grasping the Situation of Disaster Site

- Since quick and accurate collection of information is important in providing prompt and precise medical and health services at the time of an emergency, the Ministry of Regulations and Services and other relevant agencies shall gather information from the districts that suffered from the disaster on the following items:
 - (1) Damage situation of sanitation facility function in the disaster areas
 - (2) Damage situations of facilities and equipment
 - (3) Operation status of diagnostic facilities and functions
 - (4) Damage situation and operational status of staff
 - (5) Supply-demand situation of medical goods and equipment
 - (6) Situation of traffic and access to the facilities.

2) Securing of Staff for Health and Medical Care Activities

a. Dispatch of Emergency Groups and Disaster Medical Assistance Team

- DDMA of the site shall immediately work to grasp the amount of current numbers of staff engaged in health and medical activities such as medical doctors, dental doctors,

pharmacists, and health nurses.

- DDMA and the Ministry of Regulations and Services shall request the emergency groups and the disaster medical assistance team to be on standby for mobilization when medical service from outside the disaster site is potentially necessary at a time of natural or manmade disaster.
- The F/G/S/PDMAs that suffered the disaster shall request the dispatch of emergency groups and the disaster medical assistance team from other districts if a disaster occurs on a scale that requires medical assistance from outside the affected province. Also, if there are any problems in arrangements between the districts, an assistance request shall be made to the EOC in the Ministry of Regulations and Services.
- The EOC in the Ministry of Regulations and Services shall provide necessary assistance when requested by the DDMA that suffered the disaster.
- The Department of Labor and Manpower standard division shall request the necessary help such as a dispatch of medical doctors or staff in relevant agencies and provision of medical goods when needs arise for the medical care for the people that suffered from the disaster. Also, since voluntary activities by those who are engaged in medical activities are needed in early phase disaster medical service, hospitals shall, considering the situation, take necessary steps such as sending doctors and other staff based on their own decisions.

b. Securing of Transportation Systems for Emergency Patients and Staff Engaged in Medical Activities

- The Ministry of Regulations and Services, PRCS, the National Hospital and the F/G/S/PDMAs and DDMA shall ask the relevant ministries for emergency transportation of the emergency groups and the disaster medical assistance team.

8.2.8 Securing of Health and Medical Services at Disaster Site

1) Securing of Electricity, Gas and Water to the Medical Facilities

- DDMA shall ask the relevant companies for preferable operations on restoration of lifeline utilities such as electricity, gas and water at the medical facilities.
- The district that suffered the disaster shall take necessary measures to provide water and secure fuel for electrical power generation until the essential utilities are restored.
- The Ministry of Regulations and Services shall operate necessary coordination to secure water supplies to medical institutions.

2) Establishment of First-Aid Stations/Centres in Evacuation Areas

- The victimized F/G/S/PDMAs and DDMA shall, considering the damage situation, establish first-aid stations at the appropriate time and place and manage them.
- The F/G/S/PDMAs and DDMA that suffered the disaster shall, when it is expected to take a long time to install evacuation areas, establish and manage facilities that provide medical services to the people that suffered from the disaster (called first-aid centres at evacuation areas) with attention to the following items:
 - i. In establishing the first-aid centre, the operational status and the restoration status of the medical institutions at the disaster site shall be considered.
 - ii. The doctors allocated to the first-aid centre in evacuation areas shall be organized appropriately according to the situation of the evacuation site and its neighboring areas; for example, they shall at first consist mainly of physicians and then generally be shifted to include psychiatrists.
 - iii. Depending on needs, traveling dental clinic cars and portable dental diagnostic equipment shall be prepared.
- The Ministry of Regulations and Services or DEOC shall provide advice and other assistance on establishment and management of first-aid stations and first-aid centres in evacuation areas for the F/G/S/PDMAs and DDMA that suffered the disaster.

3) Health Management by Public Health Physicians and Health Nurses

- The districts that suffered the disaster shall operate health management of the victims as follows:
 - i. Health management (referring to health and nutritional guidance) shall be provided by public health physicians and health nurses, precisely in accordance with the needs of the victims.
 - ii. Operations shall be designed by making an operation plan for the health management of the victims if deemed to be necessary such as in the case of prolonged damage or increased numbers of evacuation areas.
 - iii. To cope with mental instabilities of the victims and staff who are engaged in rescue activities and health management activities, mental health care shall be provided at mental health and welfare centres.
- The province that suffered the disaster, if necessary, in operating health management for the victims, shall ask the Ministry of Regulations and Services for the dispatch of public health physicians and health nurses when it seems to be difficult for the doctors and nurses at F/G/S/PDMAs to cope with the needs by themselves.

- The Ministry of Regulations and Services shall record the number of dispatched staff of the public health physicians and health nurses requested from the F/G/S/PDMAs that suffered from the disaster, arrange the coordination between F/G/S/PDMAs that did not suffer from the disaster, and provide necessary assistance to the health management of the victimized people at the F/G/S/PDMAs and DDMA of the disaster site.

4) Supply of Medical Goods

a. Comprehension of the Disaster Site Situation

- The DDMA that suffered from the disaster shall figure out the availability and supply-demand of medical goods through wholesalers' associations of medical goods in the disaster areas and PRCS.
- The Ministry of Regulations and Services shall collect information on the supply-demand situation of medical goods from the F/G/S/PDMAs that suffered from the disaster, medical goods related Organizations, and PRCS in order to prevent any problems in provision of necessary medical goods.

b. Securing and Provision of Medical Goods

- F/G/S/PDMAs that suffered from the disaster shall assure the supply of necessary medical goods by utilizing the emergency stock of the medical goods or by requesting cooperation from the medical goods wholesalers' associations or PRCS. If a lack of medical goods in the disaster area is expected, F/G/S/PDMAs shall report it to the Ministry of Regulations and Services. Also, if confusion exists regarding transportation in the disaster area, F/G/S/PDMAs shall secure transportation means including bicycles and motorcycles.
- The Ministry of Regulations and Services shall request cooperation on provision of medical goods (except for blood preparations for blood infusion and gas gangrene antitoxin) from medical goods related Organizations if shortages of medical goods are expected and broad-based coping is judged to be necessary. Also, in providing medical goods in the disaster areas, the Ministry of Regulations and Services shall request the medical goods related Organizations to package the goods by kind to make it easier for the medical goods collection station to sort and manage them.
- The Ministry of Regulations and Services shall, if a shortage of blood preparations for infusion is expected and broad-based coping is judged to be necessary, request PRCS for cooperation in provision of them.
- The Ministry of Regulations and Services shall, if a shortage of gas gangrene antitoxin is expected and broad-based coping is judged to be necessary, request PRCS for cooperation in provision of it.

- The Ministry of Regulations and Services shall secure the transportation route by coordinating with transportation relevant ministries and provide assistance in provision of medical goods to the disaster site by medical goods related Organizations and PRCS.

c. Assortment and Management of Medical Goods

- F/G/S/PDMAs that suffered from the disaster shall ask pharmacists' associations for assistance in the management and choice of an assortment of medical goods along with training regarding the medical goods at collection stations or evacuation areas.
- The Ministry of Regulations and Services shall, if broad-based coping is judged to be necessary in implementing assortment and management of medical goods and training regarding the medication, request assistance from the pharmacists' association or other agencies.

5) Assistance from Foreign Countries Regarding Medical Services

- The Ministry of Regulations and Services shall, with regard to assistance from foreign countries in medical services, make clear policies on whether outside assistance is needed based on the following concepts as soon as possible after the disaster.
- Though medical staff shall be basically sent from other areas within the country since otherwise language barriers will arise between the victims and the staff, if the scale of the disaster is significant, foreign medical staff that can conduct autonomous activities shall be accepted if needed.

6) Epidemic Prevention

- F/G/S/PDMAs and DDMAAs that suffered from the disaster shall conduct disaster epidemic prevention activities based on the epidemic prevention plan formulated in the disaster epidemic prevention implementation outline with regard to the following items.
 - i. The province that suffered from the disaster shall take every step necessary to prevent epidemic expansion in advance, by preparing for the situations such as the deterioration of the living environment and the decay of the victims' resistance against pathogens after a disaster, and by thoroughly conducting prompt and effective training to DDMAAs within F/G/S/PDMAs.
 - ii. If a disaster happens in the summer season or if the occurrence of floods can be expected due to the increase of water in rivers because of heavy rains and cyclones, the province that suffered from the disaster shall consider requesting assistance from neighboring provinces and promptly request it if needed, since a shortage of equipment necessary for epidemic prevention is to be assumed owing to the deterioration of the sanitation situation or expansion of polluted areas.

- iii. Since an epidemic of influenza can be assumed in the evacuation areas if a disaster occurs in the winter season, the F/G/S/PDMAs that suffered from the disaster shall instruct and encourage the victims to wash hands, gargle, wear masks, get enough sleep and keep themselves and their surroundings clean.
 - iv. The evacuation areas shall intensively conduct sterilization of portable toilets since they can be a potential cause of infectious diseases, for the large number of evacuees can lead to a decay of sanitation status. Also, the people in the evacuation area shall work toward epidemic prevention in cooperation with the manager of the facility, for example by organizing community Organizations regarding sanitation through the manager.
- The Ministry of Regulations and Services shall provide necessary advisory services or other assistance for the measures listed above.

8.2.9 Securing of Drinking Water

1) Grasping the Situation of the Disaster Site

- District governments and the development authority shall collect information periodically beginning immediately after the disaster on the damage situation of water facilities and water outages.

2) Emergency Water Supply and Rehabilitation

- Water supply corporations at the disaster site shall initiate emergency water supply and rehabilitation based on the local Disaster Management Plan and action agenda prepared in advance.
- Water supply corporations at the disaster site shall request assistance from relevant corporations in other areas through province-based mutual assistance agreements in case of a shortage of needed manpower or equipment for emergency water supply and rehabilitation.
- District governments and the development authority that suffered the disaster shall request wide-area assistance from water supply corporations in F/G/S/PDMAs and other relevant Organizations based on the local Disaster Management Plan and action agenda prepared in advance, and coordinate the assistance activities.
- District governments and the development authority shall, if requested by the F/G/S/PDMAs that suffered the disaster or if judged as necessary according to the damage situation, request assistance from water supply corporations across the country and coordinate their operation, while establishing a local base for their activities.

- District governments and the development authority shall ask the relevant ministries for assistance if needed, in order to simplify the procedures for acquiring permission for rehabilitation works.

3) Information Delivery to the Victims

- Province/district governments, the development authority and water supply corporations shall appropriately provide information, through bulletin boards, magazines, mass media and web network services, on points such as the damage situation of water supply facilities, risk of secondary disasters, status of emergency water supply and rehabilitation, expected time of completing restoration and things to pay attention to for the drinking water with regard to sanitary aspects.

8.2.10 Assurance of Food Sanitation

1) Prevention of Food Poisoning

- District governments and the development authority that suffered the disaster, including the DDMA with public health institutions and within the specified area, shall send food sanitation inspectors to food distribution bases and ask them to monitor how sanitation is maintained and give instructions if necessary.
- District governments and the development authority that suffered the disaster shall send food sanitation inspectors to evacuation areas and ask them to give instructions on hygienic handling of food, cooking, disposal of food that is not appropriate for eating and sterilization of equipment and containers.
- District governments and the development authority that suffered the disaster shall inspect the food related business facilities, and if any significant hygienic defects are found with the construction of the facilities, food processing equipment or water supply, it shall give instructions for improvements.
- The food hygiene association at the disaster site shall provide consultation and instruction to the food related business facilities regarding cooking and hygienic handling of foods by cooperating with the province that suffered the disaster.
- District governments and the development authority shall secure the communication systems with the F/G/S/PDMAs that suffered the disaster and provide necessary assistance such as requesting assistance for assuring sanitation to neighboring DDMA's if needed.

2) Role Sharing at the Time of Food Poisoning

- If a case of food poisoning breaks out, the F/G/S/PDMAs that suffered the disaster shall ask the food sanitation inspectors to conduct necessary inspections, and at the same time seek to

prevent the expansion of the damage by investigating the food and facilities that caused the outbreak.

- F/G/S/PDMAs that suffered the disaster shall report to the Ministry of Regulations and Services if there is a possibility of expansion of food poisoning.
- The Ministry of Regulations and Services shall take necessary steps to prevent expansion of the damage, for example, by requesting assistance from neighboring F/G/S/PDMAs based on the request from the F/G/S/PDMAs that suffered the disaster if the damage of the food poisoning is wide-spread and difficult to handle only by the victimized F/G/S/PDMAs.

8.2.11 Measures Regarding Poisonous or Deleterious Substances

1) Collection and Communication of Disaster Related Information

a. Communication of Information regarding Poisonous or Deleterious Substances Related Accidents

- When a large-scale accident involving poisonous or deleterious substances happens, the F/G/S/PDMAs at the disaster site shall report it to the Ministry of Regulations and Services.
- When a large-scale disaster happens, the Ministry of Regulations and Services shall report the accident related information to the NDMA, relevant ministries, relevant F/G/S/PDMAs and other relevant agencies.
- District governments and the development authority shall forward information necessary for implementing emergency response measures such as the features of the concerned poisonous or deleterious substances and warnings on handling them when it communicates information regarding the accident.
- F/G/S/PDMAs shall forward the information received from the Ministry of Regulations and Services to the relevant DDMA and agencies.

b. Collection and Communication of the Initial Information of Damage Immediately After a Poisonous or Deleterious Substance Related Accident

- F/G/S/PDMAs that suffered the disaster shall collect the information on current situation of human damage or fires with cooperation from the districts depending on needs, grasp the general information on the damage scale and report it to the Ministry of Regulations and Services by collecting information from the notifications submitted by business entities that deal with poisonous and deleterious substances from on-site inspections.
- The Ministry of Regulations and Services shall immediately grasp the damage situation and promptly forward the information to NDMA and other relevant agencies.

- In case of a poisonous or deleterious substances related disaster with enormous social impacts, the Ministry of Regulations and Services shall report the primary information on the damage to NDMA immediately.

c. Collection and Communication of General Damage Information on Poisonous or Deleterious Substances Related Accidents

- The province that suffered the disaster shall grasp the information on the damage situation by collecting information with cooperation from the districts depending on needs and from the notifications submitted by business entities that deal with poisonous and deleterious substances, or from on-site inspections. They will report this information to the Ministry of Regulations and Services.
- The Ministry of Regulations and Services shall report the collected information to the Prime Minister if needed.
- The Ministry of Regulations and Services shall communicate with the relevant ministries and agencies in order to share the collected information on damage.

d. Communication of the Information on Emergency Response Measures against Poisonous or Deleterious Substance Related Accidents

- F/G/S/PDMAs shall report the following information to the Ministry of Regulations and Services: information on the current status of emergency response measures by the business entities handling poisonous or deleterious substances that is collected from the notifications submitted by the business entities or collected from on-site inspections, and the information regarding the establishment status of a task force.
- F/G/S/PDMAs shall report the status of emergency response activities or establishment status of a task force as needed to the Ministry of Regulations and Services or to EOC after its establishment with cooperation from districts if needed.
- The Ministry of Regulations and Services shall report the collected information on emergency response activities to the Prime Minister depending on needs.

8.2.12 Activities for Preventing Expansion of a Disaster

- F/G/S/PDMAs shall take appropriate emergency response measures in cooperation with DDMA if needed, such as prevention of effusion and expansion of the poisonous or deleterious substances, removal of the effused substances and evacuation of the residents.
- Provincial governments shall instruct the business entities that handle poisonous and deleterious substances to take necessary emergency measures to prevent health and sanitation damage.

- The Ministry of Regulations and Services shall provide necessary advisory service and other assistance regarding the measures written above.

8.2.13 Measures Regarding Occupational Injury

- The head of the relevant labor standard supervision office in the disaster site shall work to prevent the expansion of the damage by providing necessary supervision and instruction to the owners of business entities that have potential risks of secondary disasters. Regarding suspension of the use of the hazardous chemical equipment, security steps, for example, prevention of effusion of hazardous materials, evacuation of workers and other emergency response measures, shall be taken.

8.3 Post-Disaster Measures

8.3.1 Rehabilitation of the Damaged Facilities

1) Rehabilitation of Medical Facilities

- The Ministry of Regulations and Services and the F/G/S/PDMAs that suffered the disaster shall investigate the damage situation of medical facilities and work for prompt rehabilitation. In implementing rehabilitation, attention shall be paid to earthquake protection, fire endurance, incombustibility and strength of the facility building in order to prevent secondary damage.

2) Rehabilitation of Social Welfare Facilities

- For disaster rehabilitation of social welfare facilities at the disaster site, the Ministry of Regulations and Services and other relevant departments shall work toward early rehabilitation with subsidies from the government or loans from medical agencies.

3) Rehabilitation of Water Supply Facilities

- In rehabilitating, water supply corporations shall conduct necessary improvement and rehabilitation from the viewpoint of enhancing earthquake protection giving attention to the prevention of secondary damage, and promote planned rehabilitation measures such as improving earthquake protection and constructing emergency water storage facilities.
- The Ministry of Regulations and Services shall provide technical and financial assistance for the rehabilitation measures implemented by water supply corporations if the need arises.

8.3.2 Measures on Disaster Rehabilitation Construction

1) Securing of Work Force

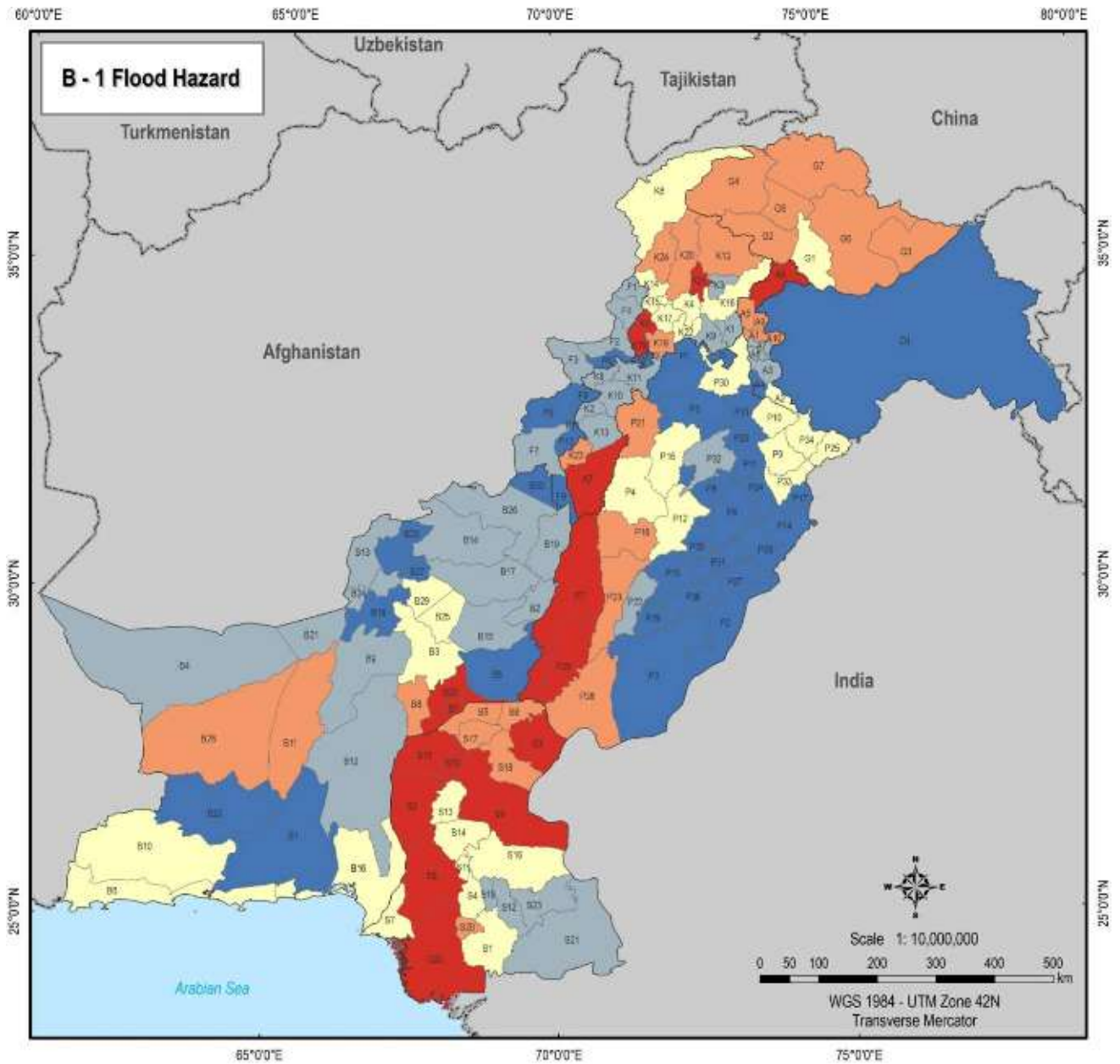
- The head of the public job stabilization office, which administrates the disaster area, shall secure the necessary work force through cooperation with the relevant public job

stabilization office through implementation of wide-area job introduction and provision of job information, in order for the disaster rehabilitation construction to be promoted smoothly.

2) Assurance of Security and Sanitation

- The labor standard supervision office that administrates the disaster area shall supervise and instruct the disaster rehabilitation construction, and assure the security and sanitation of the work forces engaged in the project.

APPENDIX – I
HAZARD AND RISK MAPS



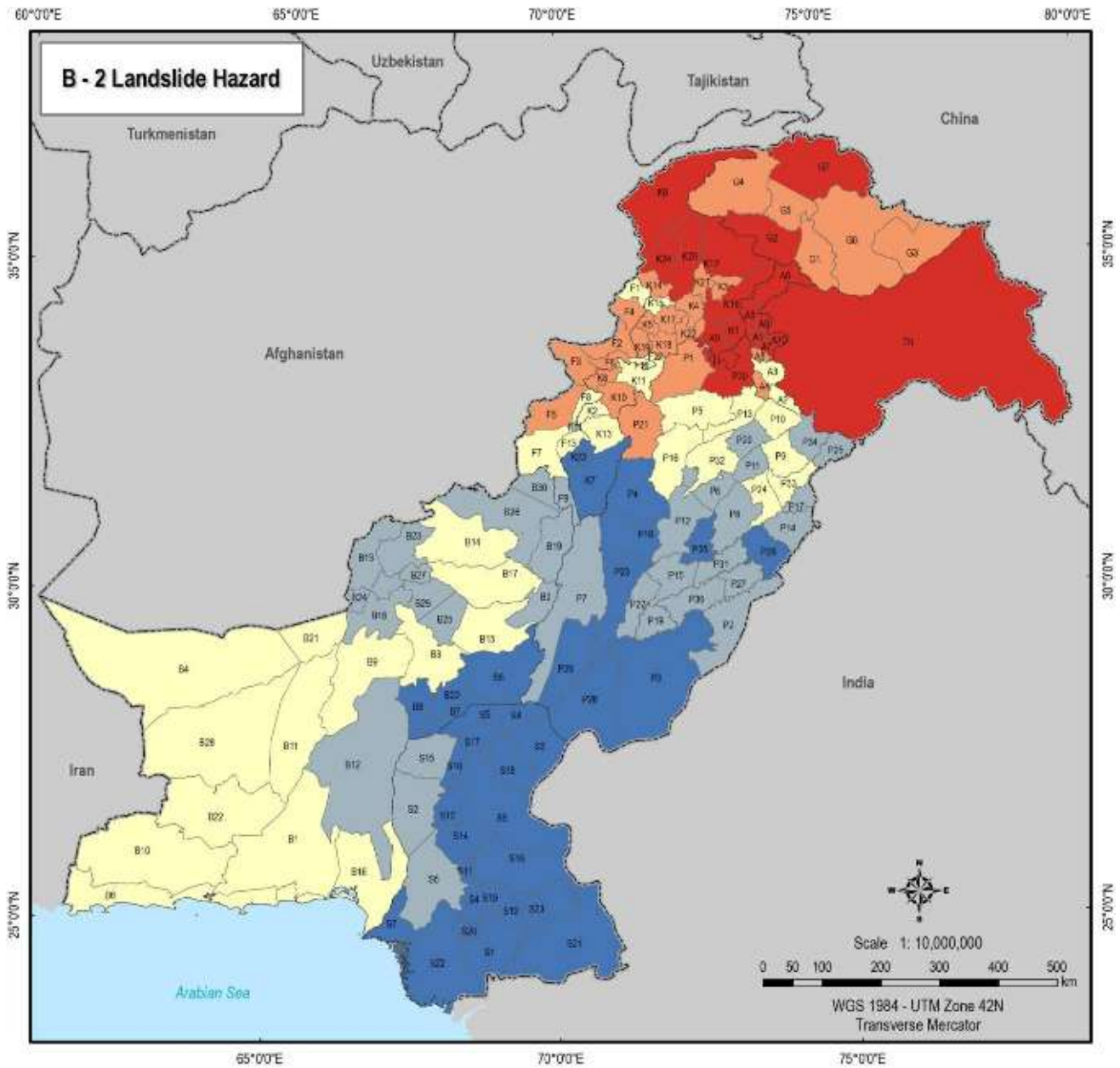
No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S20	Masood	K5	Gajit	P2	Turkhatnagar	P31	Srinagar
A2	Bhimber	S21	Nasrki	K6	Saidu	P3	Saravali	P32	Sargodha
A3	Kali	S22	Pirgar	K7	Huzarshager	P4	Shikar	P33	Shekrapora
A4	Mirpur	S23	Ptoin	K8	Inderkot	P5	Chakwal	P34	Sialkot
A5	Muzaffargarh	S24	Gardhi	K9	Astardob	P6	Chenab	P35	Toba Tek Singh
A6	Rawan	S25	Sibi	K10	Barau	P7	D. G. Khan	P36	Vahar
A7	Panoch	S26	Jhok	K11	Talaghar	P8	Faisalabad	S1	Badli
A8	Sudhot	S27	Dawat	K12	Bunor	P9	Sajawal	S2	Dadu
A9	Hattan	S28	Wahak	K13	Chenab	P10	Dugri	S3	Ghaki
A10	Harok	S29	Harna	K14	Chel	P11	Hakrotd	S4	Huyyamad
B1	Awam	S30	Shoran	K15	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Bathian	S1	Jepuldi Aka	K16	Hanga	P13	Jhalan	S6	Jamshoo
B3	Bolan	F1	Bejan Agency	K17	Hatpur	P14	Kaar	S7	Kaachi
B4	Chaga	F2	Rhyter Agency	K18	Karak	P15	Khanawal	S8	Kashmor
B5	Dera Bugt	F3	Kuram Agency	K19	Khal	P16	Khushab	S9	Khatra
B6	Geodia	F4	Mulamad Agency	K20	Kotlaia	P17	Lahor	S10	Lakara
B7	Jehkot	F5	North Wazirhan Agency	K21	Laki Manawal	P18	Lodhi	S11	Makor
B8	Jhal Magi	F6	Grozza Agency	K22	Lower Dir	P19	Lodhan	S12	Mipur Khas
B9	Kalal	F7	South Wazirhan Agency	K23	Makrotd	P20	Shadi Bahadudin	S13	Masohar Feroz
B10	Koch	F8	FR Barau	K24	Mawadon	P21	Mianwali	S14	Masohar
B11	Khadan	F9	FR D. I. Khan	K25	Mardan	P22	Multan	S15	Combar and Shahdadkot
B12	Khadan	F10	FR Kufal	K26	Rawalhan	P23	Muzaffargarh	S16	Singhar
B13	Kila Ardakhan	F11	FR Laki Manawal	K27	Peshawar	P24	Mankara Sahi	S17	Sikrapur
B14	Kila Sakliah	F12	FR Postnagar	K28	Sawal	P25	Mardian	S18	Sukkur
B15	Korlu	F13	FR Tank	K29	Shargha	P26	Chas	S19	Tando Allahyar
B16	Laraba	G1	Aoran	K30	Sawal	P27	Papoton	S20	Tando Muhammad Khan
B17	Lorala	G2	Daman	K31	Tank	P28	Rafiq Yar Khan	S21	Thoponkar
B18	Makur	G3	Qandhar	K32	Upper Dir	P29	Rasrapur	S22	Tulla
B19	Mankhal	G4	Shore	F1	Atok	P30	Masohar	S23	Urakot

Legend
Flood Hazard Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan

Appendix-I Hazard & Risk Maps

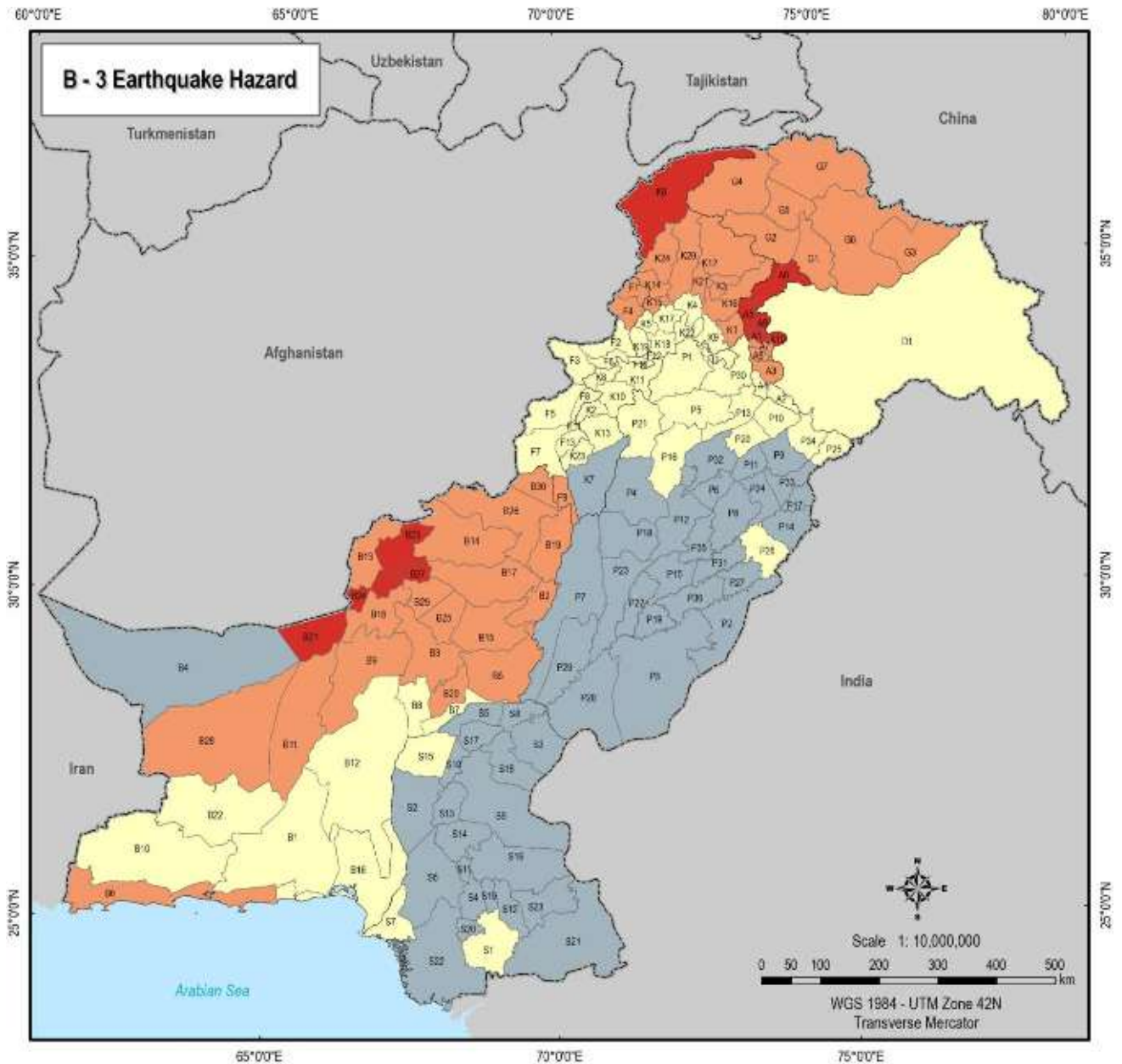


No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bugt	S02	Narowal	G6	Citgit	P2	Bahawalpur	P31	Sahiwal
A2	Brecher	S01	Narho	G6	Swabi	P3	Bahawalpur	P32	Sargodha
A3	Kull	S02	Ferozpur	G7	Muzaffargarh	P4	Bhakkar	P33	Sialkot
A4	Mipur	S02	Pafdar	H1	Haleji	P5	Chakwal	P34	Sialkot
A5	Muzaffargarh	S04	Quetta	K1	Attock	P6	Chenab	P35	Toba Tek Singh
A6	Nowshera	S05	Sibi	K2	Sargha	P7	D. G. Khan	P36	Yahol
A7	Punuch	S06	Jhok	K3	Balaghar	P8	Faisalabad	B1	Badr
A8	Sudhot	S07	Zare	K4	Buner	P9	Gujranwala	G2	Cheki
A9	Haban	S08	Wahar	K5	Cherasala	P10	Gujrat	G3	Ghosi
A10	Haveli	S05	Haveli	K6	Chak	P11	Hafizabad	G4	Hyderabad
B1	Awami	S06	Shoran	K7	D. I. Khan	P12	Jhang	G5	Jacobabad
B2	Balochan	B1	Deputed Area	K8	Hangu	P13	Jhelum	G6	Jaranahar
B3	Bolan	P1	Sagar Agency	K9	Hatour	P14	Kasur	G7	Karachi
B4	Chagai	P5	Khyber Agency	K10	Karachi	P15	Khanewal	G8	Kashmir
B5	Dera Bugt	P5	Kurram Agency	K11	Kohat	P16	Khuzdhar	G9	Khatour
B6	Chowdar	P4	Multan Agency	K12	Kohistan	P17	Lahore	S10	Larkana
B7	Jalabad	P5	North West Frontier Agency	K13	Lakki Marwat	P18	Lahor	S11	Maler
B8	Jhal Magsi	P6	Droakha Agency	K14	Lower Dir	P19	Lodhran	S12	Mipur Khos
B9	Kalat	P7	South West Frontier Agency	K15	Malakand	P20	Mandi Bahaudin	S13	Rashtromo Feroze
B10	Koch	P8	FR Bara	K16	Manshera	P21	Mianwali	S14	Rawalpindi
B11	Khanpur	P8	FR D. I. Khan	K17	Mardan	P22	Multan	S15	Gambor and Shahdadkot
B12	Khyber	P10	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Sarghar
B13	Kila Abdallah	P11	FR Lakki Marwat	K19	Peshawar	P24	Nankana Sahib	S17	Sialkot
B14	Kila Sukkiah	P12	FR Peshawar	K20	Swat	P25	Narawal	S18	Sialkot
B15	Kohli	P13	FR Taxar	K21	Shangha	P26	Okara	S19	Tanda Akhlyar
B16	Ladakh	G1	Azhar	K22	Swat	P27	Pakistan	S20	Tanda Mubammad Khos
B17	Loralai	G2	Chaman	K23	Tank	P28	Rohor Yar Khan	S21	Thapskot
B18	Mianag	G3	Guzdar	K24	Upper Dir	P29	Rajapur	S22	Tuda
B19	Murshid	G4	Guner	P1	Attock	P30	Rawalpindi	S23	Urmitkot

Legend
Landslide Hazard
Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan



No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S08	Nainital	G8	Calat	P2	Behawalpur	P21	Sohawal
A2	Bamber	S01	Narail	G6	Scado	P9	Behawalpur	P12	Gargacha
A3	Kali	S02	Fongor	G7	Huzuzhagar	P4	Shokar	P35	Sokhupata
A4	Mipur	S03	Patan	H1	Iberwal	P5	Chakwal	P34	Sakot
A5	Muzaffabad	S04	Qadir	K1	Attock	P6	Cherat	P35	Tona Tal Singh
A6	Nedun	S05	Sibi	K2	Bara	P7	D. G. Khan	P36	Valeri
A7	Pauch	S06	Jhal	K3	Baigun	P8	Faisalabad	S1	Badin
A8	Sathel	S07	Jamat	K4	Buner	P9	Degroonah	S2	Dadu
A9	Hafian	S08	Wohran	K5	Charsadda	P10	Gujrat	S3	Ghani
A10	Hawal	S09	Hawal	K6	Chitral	P11	Hafizabad	S4	Hyderabad
O1	Awami	S10	Shenai	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Barkhan	S11	Devaldi Arni	K8	Hangu	P13	Jhelum	S6	Jamshori
B3	Bati	F1	Southern Agency	K9	Haveli	P14	Kasur	S7	Karachi
B4	Chagn	F2	Khyber Agency	K10	Karak	P15	Khanewal	S8	Kashmir
B5	Dera Bugti	F3	Kurram Agency	K11	Kohat	P16	Khuzhab	S9	Khalpur
B6	Devali	F4	Muzaffar Agency	K12	Kohistan	P17	Lahore	S10	Larkana
B7	Jhelum	F5	North Western Agency	K13	Laki Mankot	P18	Rawal	S11	Makar
B8	Jhal Magsi	F6	Quetta Agency	K14	Lawal Dir	P19	Lodhran	S12	Mipur Khaz
B9	Kala	F7	South Western Agency	K15	Makand	P20	Mandi Bahaudin	S13	Nasirabad
B10	Kech	F8	FR Bara	K16	Mandora	P21	Mianwali	S14	Nawabshah
B11	Khanor	F9	FR D. I. Khan	K17	Mardan	P22	Multan	S15	Comber and Shahabad
B12	Khuzdar	F10	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Singhar
B13	Kila Aradab	F11	FR Laki Mankot	K19	Peshawar	P24	Nankana Sahib	S17	Sikrapur
B14	Kila Salkish	F12	FR Peshawar	K20	Soyat	P25	Narwal	S18	Sukkur
B15	Kohat	F13	FR Tanc	K21	Shangha	P26	Chana	S19	Tanda Abdiyar
B16	Ladabi	G1	Azore	K22	Suati	P27	Pakistan	S20	Tanda Muhammad Khan
B17	Loralai	G2	Domin	K23	Tank	P28	Rohri Varkhan	S21	Thaneskar
B18	Mianki	G3	Quancha	K24	Upper Dir	P29	Rashtari	S22	Thala
B19	Muzaffar	G4	Ganer	F1	Atok	P30	Rawalpindi	S23	Umerkot

- Legend**
Earthquake Hazard
Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low

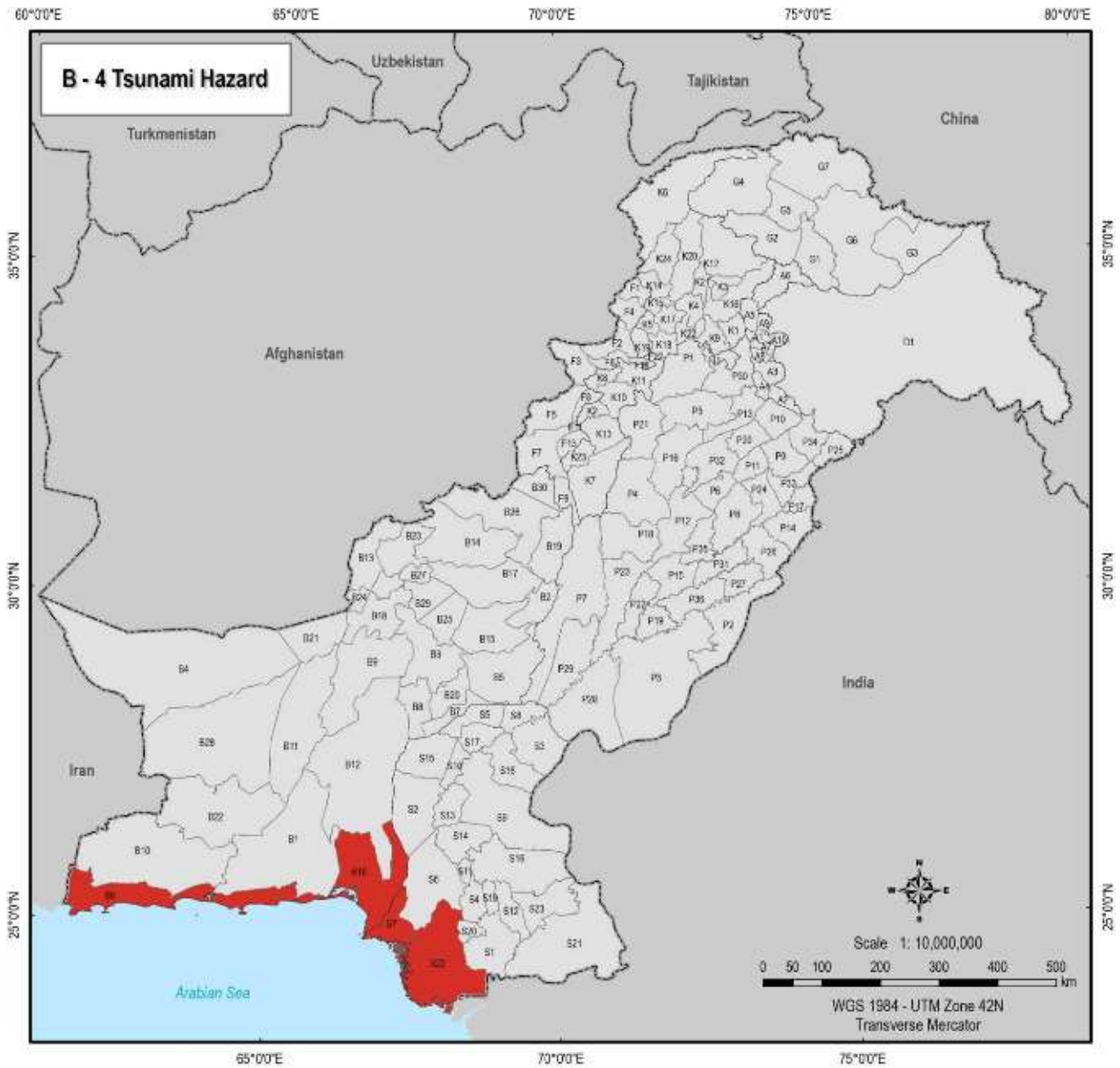
Source: JICA Study Team



The Project for National Disaster Management Plan in the Islamic Republic of Pakistan



Appendix-I Hazard & Risk Maps

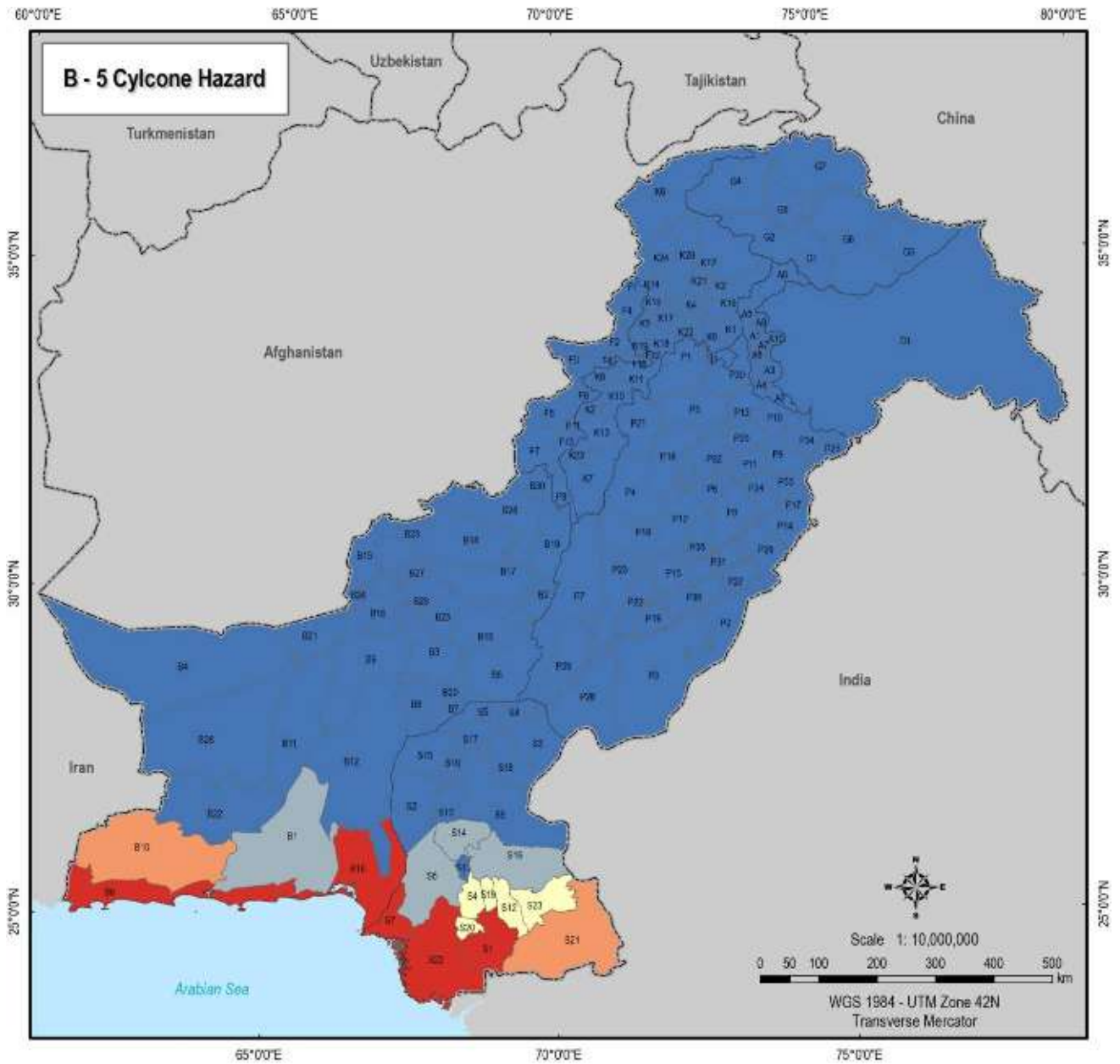


No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bugt	S02	Narowal	G6	Citgit	P2	Bahawalpur	P31	Sahiwal
A2	Brecher	S01	Narcho	G6	Swabi	P3	Bahawalpur	P32	Sargodha
A3	Kull	S02	Ferozpur	G7	Muzaffargarh	P4	Bhakkar	P33	Sialkot
A4	Mipur	S02	Pafdar	H1	Halewadi	P5	Chakwal	P34	Sialkot
A5	Muzaffargarh	S04	Quetta	K1	Attock	P6	Chitral	P35	Toba Tek Singh
A6	Nowshar	S25	Sibi	K2	Sargha	P7	D. G. Khan	P36	Yahudi
A7	Punuch	S06	Jhok	K3	Balaghan	P8	Faisalabad	S1	Badr
A8	Sultrah	S07	Zawal	K4	Buner	P9	Gujranwala	S2	Dadu
A9	Habib	S08	Wahawal	K5	Charsadda	P10	Gujrat	S3	Ghosi
A10	Haveli	S05	Haveli	K6	Chakwal	P11	Hafizabad	S4	Hyderabad
D1	Awami	S06	Shawal	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Balochan	B1	Deputed Area	K8	Hangu	P13	Jhelum	S6	Jamshoro
B3	Bolan	P1	Sagar Agency	K8	Hafizpur	P14	Kasur	S7	Karachi
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B7	Jalambad	P5	North Waziristan Agency	K10	Lakki Marwat	P18	Lahor	S11	Maler
B8	Jhal Magsi	P6	Droak Agency	K10	Lawal Dir	P19	Lodhran	S12	Mipur Khos
B9	Kalat	P7	South Waziristan Agency	K15	Malakand	P20	Mandawalband	S13	Rashtromo Feroze
B10	Koch	P8	FR Barau	K16	Mansherwah	P21	Mianwali	S14	Rawalpoto
B11	Kharar	P8	FR D. I. Khan	K17	Mardan	P22	Mulhan	S15	Gambor and Shahbadkot
B12	Khyber	P10	FR Kohat	K18	Nowshara	P23	Muzaffargarh	S16	Sarghar
B13	Kila Assabeh	P11	FR Lakki Marwat	K19	Peshawar	P24	Nankana Sahib	S17	Sialkot
B14	Kila Sukkiah	P12	FR Peshawar	K20	Swat	P25	Narawal	S18	Sialkot
B15	Kohli	P13	FR Taxar	K21	Shangha	P26	Okara	S19	Tanda Akhlyar
B16	Ladakh	G1	Azhar	K22	Swat	P27	Pakistan	S20	Tanda Muhammad Khos
B17	Loralai	G2	Deonar	K23	Tank	P28	Rohor Yar Khan	S21	Thapskot
B18	Mianag	G3	Guzdar	K24	Upper Dir	P29	Rajapur	S22	Tuda
B19	Munachal	G4	Gawal	P1	Attock	P30	Rawalpoto	S23	Urrewot

Legend
Tsunami Hazard Category
■ Very High
■ No Hazard

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan



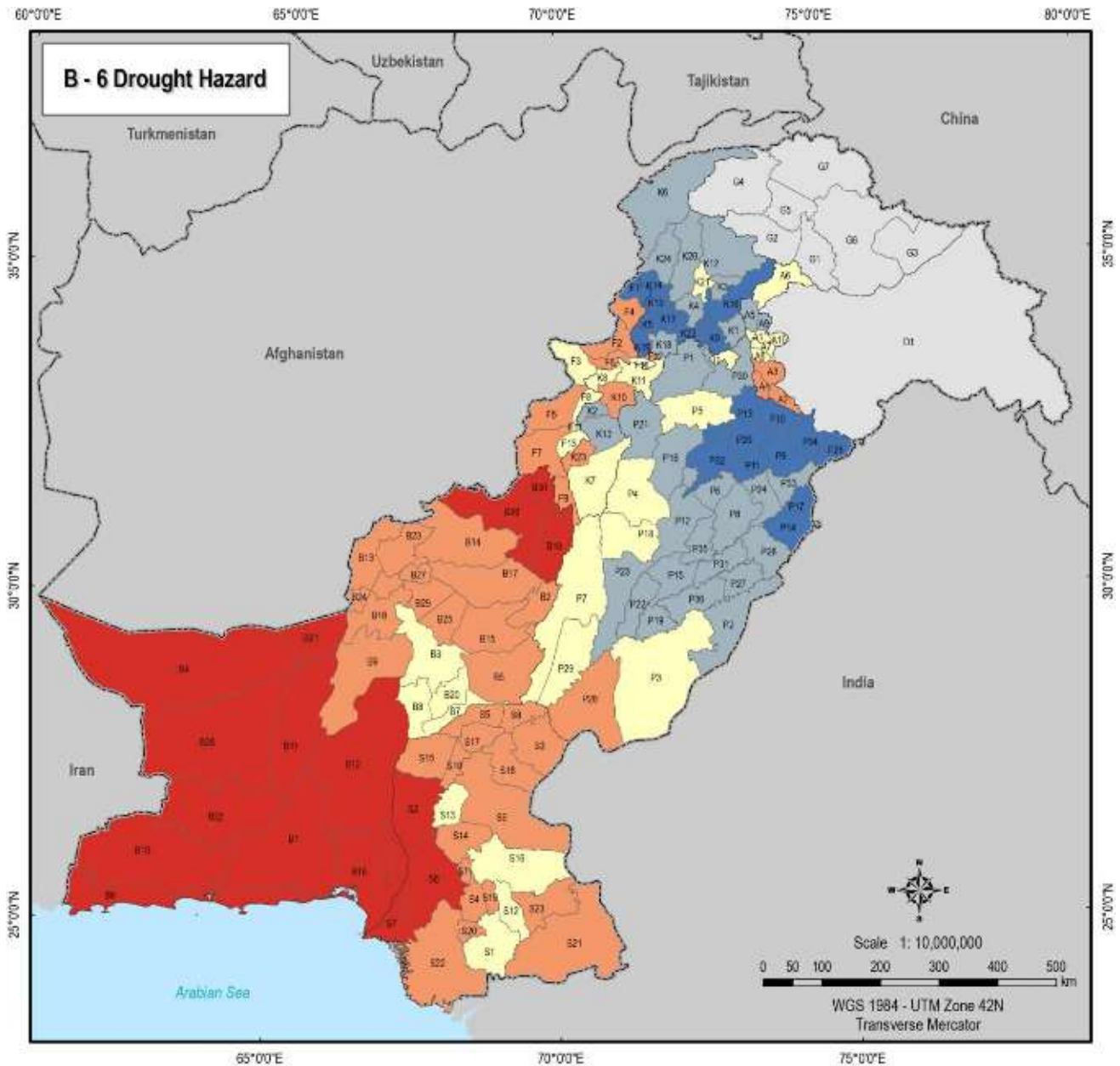
No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S01	Nainital	G5	Calat	P2	Behawalpur	P21	Sohawal
A2	Bamber	S01	Nainital	G6	Scado	P3	Behawalpur	P22	Singapota
A3	Kali	S02	Fongor	G7	Huzza-Nagar	P4	Bhokar	P23	Sokhupota
A4	Mipur	S03	Patan	H1	Iberwal	P5	Chakwal	P24	Sakot
A5	Muzaffabad	S04	Quais	K1	Attock	P6	Cherat	P25	Tona Tal Singh
A6	Nedun	S05	Sibi	K2	Bahra	P7	D. G. Khan	P26	Valeri
A7	Pauch	S06	Jhok	K3	Baiguan	P8	Faisalabad	S1	Badin
A8	Sathet	S07	Jamat	K4	Buner	P9	Degroonvale	S2	Dadu
A9	Hafian	S08	Wohran	K5	Cherasada	P10	Dugri	S3	Ghosi
A10	Hawal	S09	Hawal	K6	Chitral	P11	Hafizabad	S4	Hyderabad
B1	Awami	S10	Shoran	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Barkhan	S11	Devaldi Arni	K8	Hangu	P13	Jhelum	S6	Jamshahi
B3	Bati	F1	Southern Agency	K9	Haveli	P14	Kaizer	S7	Karachi
B4	Chagn	F2	Khyber Agency	K10	Karak	P15	Khanewal	S8	Kashmore
B5	Dora Bugti	F3	Kurum Agency	K11	Kohat	P16	Khuzhab	S9	Khatour
B6	Devala	F4	Mulamad Agency	K12	Kohistan	P17	Lahore	S10	Larkana
B7	Jeholbat	F5	North Waziristan Agency	K13	Laki Manawal	P18	Rawal	S11	Makar
B8	Jhal Magi	F6	Orakza Agency	K14	Lawal Dir	P19	Lodhran	S12	Mipur Khaz
B9	Kala	F7	South Waziristan Agency	K15	Makand	P20	Mandi Bahaudin	S13	Nasirabad Faisal
B10	Kech	F8	FR Baru	K16	Margalra	P21	Mianwali	S14	Nawabshah
B11	Khazir	F9	FR D. I. Khan	K17	Mardan	P22	Multri	S15	Comber and Shahabad
B12	Khuzdar	F10	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Singhar
B13	Kila Arakab	F11	FR Laki Manawal	K19	Peshawar	P24	Nankana Sahib	S17	Sikrapur
B14	Kila Salkish	F12	FR Poshawar	K20	Soyat	P25	Narawal	S18	Sukkur
B15	Kohak	F13	FR Tanc	K21	Shargha	P26	Chana	S19	Tanda Abdiyar
B16	Ladabi	G1	Azore	K22	Suati	P27	Pakistan	S20	Tanda Muhammad Khan
B17	Lorki	G2	Domin	K23	Tank	P28	Rohri Varkhan	S21	Tharparkar
B18	Mering	G3	Quancha	K24	Upper Dir	P29	Raspara	S22	Thale
B19	Muzafel	G4	Graver	F1	Atok	P30	Rawalpindi	S23	Umerkot

Legend
Cyclone Hazard Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan

Appendix-I Hazard & Risk Maps

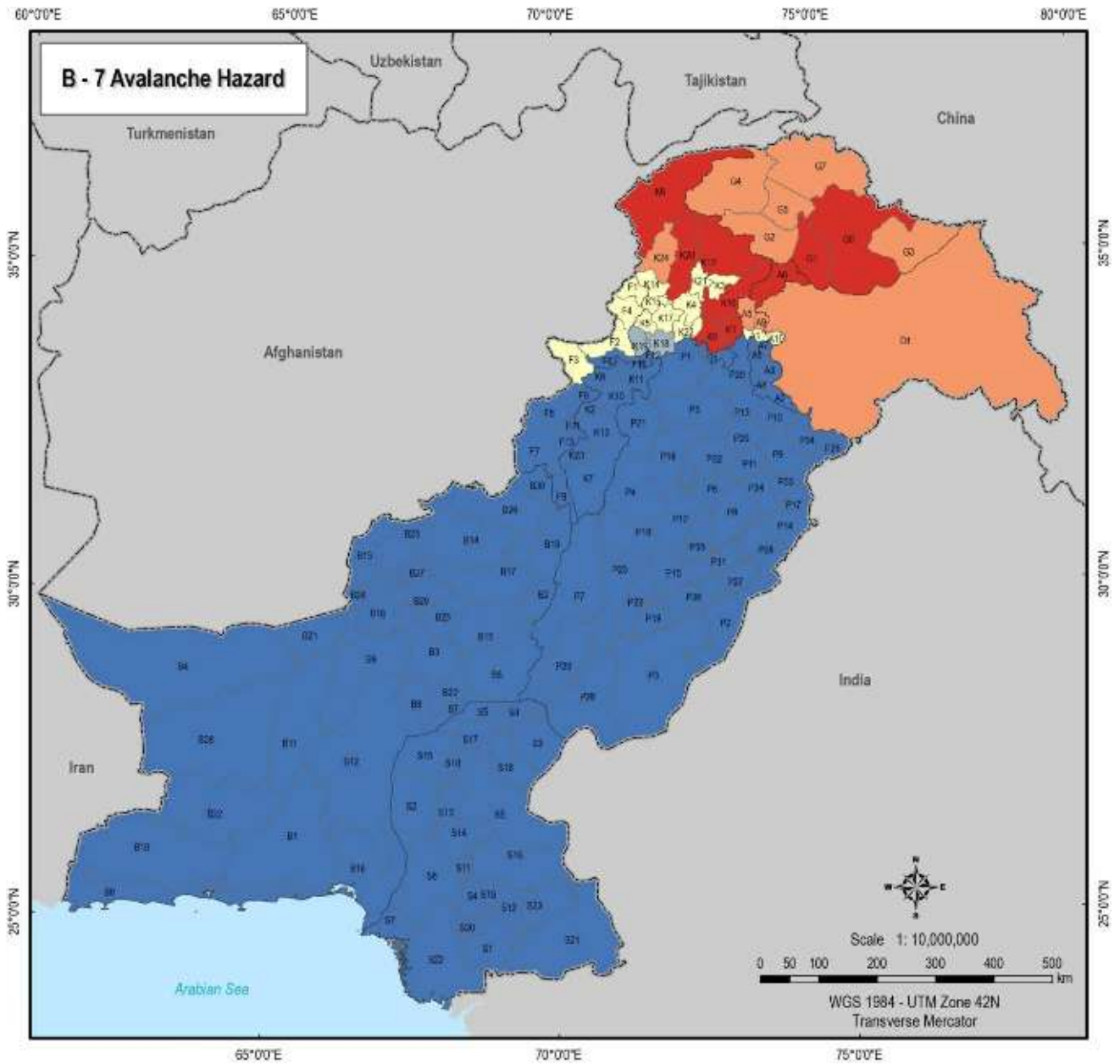


No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Baigh	S02	Narabad	G0	Gilgit	P2	Bahawalnagar	P31	Sahiwal
A2	Bandera	S01	Mach	G6	Skardu	P3	Bahawalpur	P32	Sargodha
A3	Koll	S02	Pongor	G7	Muzaffargarh	P4	Bhakkar	P33	Shekhupura
A4	Mirpur	S02	Pishin	H	Islamabad	P5	Chakwal	P34	Sialkot
A5	Muzaffargarh	S04	Qadir	K1	Attock	P6	Cherat	P35	Toba Tek Singh
A6	Neelum	S05	Sibi	K2	Bahra	P7	D. G. Khan	P36	Vaher
A7	Panjk	S06	Jhok	K3	Balochan	P8	Faisalabad	S1	Badr
A8	Sudhan	S07	Zoat	K4	Dera	P9	Gujranwala	S2	Dadu
A9	Habib	S08	Wahat	K5	Charsadda	P10	Suport	S3	Ghota
A10	Havel	S08	Havel	K6	Chitral	P11	Hafizabad	S4	Hyderabad
O1	Ararain	S06	Sheras	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Bannan	01	Deputed Area	K8	Hangu	P13	Jhelum	S6	Jaranah
B3	Bolan	P1	Sagar Agency	K9	Hokair	P14	Kabul	S7	Karachi
B4	Chagai	P3	Khyber Agency	K10	Karac	P15	Khanewal	S8	Kashmore
B5	Dera Bugti	P5	Kuram Agency	K11	Kohat	P16	Khuzhab	S9	Khalpur
B6	Chowdar	P4	Mulamad Agency	K12	Kohat	P17	Lahore	S10	Larkana
B7	Jalambad	P5	North Waziristan Agency	K13	Laki Mankot	P18	Leah	S11	Maler
B8	Jhal Magsi	P6	Orakzai Agency	K14	Lawal Di	P19	Lodhran	S12	Mirpur Khas
B9	Kalat	P7	South Waziristan Agency	K15	Makland	P20	Mandi Bahaudran	S13	Muzaffargarh
B10	Kach	P8	FR Bara	K16	Marsahat	P21	Marsahat	S14	Muzaffargarh
B11	Khanpur	P9	FR D. I. Khan	K17	Multan	P22	Multan	S15	Gombor and Shahbadkot
B12	Khyber	P10	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Sarghar
B13	Kila Abdallah	P11	FR Laki Mankot	K19	Peshawar	P24	Muzaffargarh	S17	Shekhar
B14	Kila Sukkiah	P12	FR Peshawar	K20	Sawat	P25	Muzaffargarh	S18	Sukkur
B15	Kohat	P13	FR Tank	K21	Shangha	P26	Choa	S19	Tando Allahyar
B16	Ladakh	G1	Azore	K22	Sivas	P27	Pakistan	S20	Tando Mubarrat Khan
B17	Loral	G2	Domra	K23	Tank	P28	Robat Yar Khan	S21	Thokozar
B18	Mehar	G3	Ghanche	K24	Upper Di	P29	Rajpur	S22	Tinhi
B19	Muzaffargarh	G4	Ghor	P1	Attock	P30	Rawalpind	S23	Unseror

Legend
Drought Hazard Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low
■ Non Hazard

Source: JICA Study Team



The Project for National Disaster Management Plan in the Islamic Republic of Pakistan



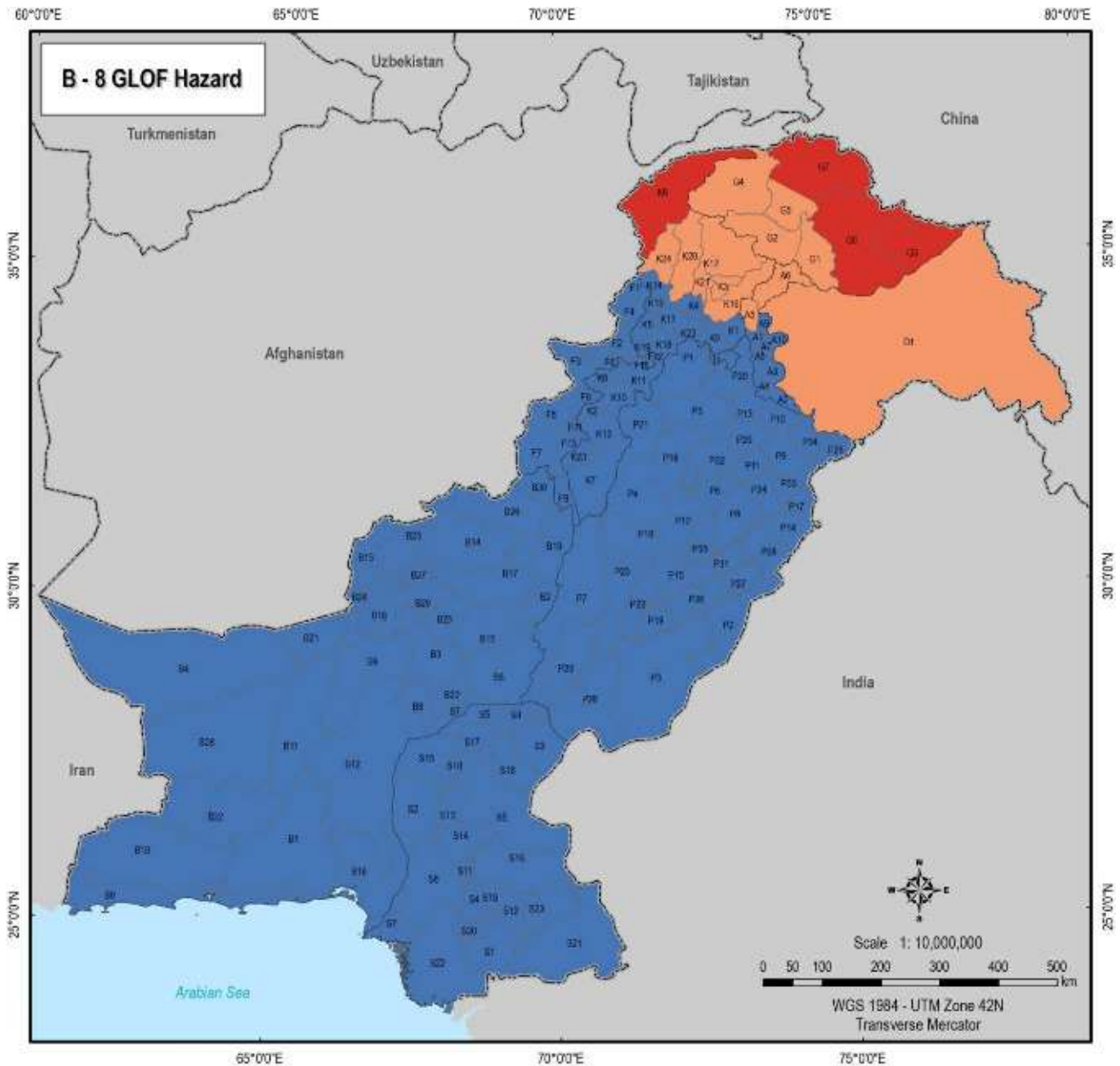
No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S02	Naurobad	G5	Calgit	P2	Bahawalnagar	P31	Sohawal
A2	Bamber	S01	Narato	G6	Skardu	P3	Bahawalpur	P32	Sargodha
A3	Kali	S02	Pongal	G7	Huznahagar	P4	Shakar	P33	Shikarpur
A4	Mirpur	S03	Patan	H1	Islamabad	P5	Chakwal	P34	Sialkot
A5	Muzaffargarh	S04	Quetta	K1	Attock	P6	Chiniot	P35	Toba Tek Singh
A6	Nedun	S05	Sibi	K2	Bara	P7	D. G. Khan	P36	Vahar
A7	Paoch	S06	Jhad	K3	Baunpur	P8	Faisalabad	S1	Bach
A8	Sathar	S07	Jhel	K4	Buner	P9	Gujranwala	S2	Dadu
A9	Hafian	S08	Wahar	K5	Charsadda	P10	Suport	S3	Shek
A10	Hawal	S09	Hawal	K6	Chitral	P11	Hafizabad	S4	Frydabad
O1	Awasar	S06	Shimra	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Bardhan	S1	Deputed Area	K8	Hingol	P13	Jhelum	S6	Jarshah
B3	Bolan	F1	Southern Agency	K9	Haripur	P14	Kabul	S7	Karachi
B4	Chaga	F2	Khyber Agency	K10	Karac	P15	Khanawal	S8	Kashmir
B5	Dera Bugt	F3	Kurum Agency	K11	Kohat	P16	Khanpur	S9	Khatkar
B6	Dwadat	F4	Mulmand Agency	K12	Kohistan	P17	Lahore	S10	Larkana
B7	Jhelanbar	F5	North Waziristan Agency	K13	Lak Mawar	P18	Iskan	S11	Makran
B8	Jhel Magi	F6	Swat Agency	K14	Lawal Dir	P19	Lodhran	S12	Mirpur Khas
B9	Kalat	F1	South Waziristan Agency	K15	Makrand	P20	Mandi Bahaudran	S13	Muzaffargarh
B10	Kech	F2	FR Bara	K16	Marsyrah	P21	Moenab	S14	Muzaffargarh
B11	Khor	F3	FR D. I. Khan	K17	Mardan	P22	Multan	S15	Gandhar and Shahdol
B12	Khuzdar	F4	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Banghar
B13	Kila Arsalah	F11	FR Lakul Mawar	K19	Peshawar	P24	Muzaffargarh	S17	Shekpur
B14	Kila Salkhan	F12	FR Poshanar	K20	Sawal	P25	Muzaffargarh	S18	Sialkot
B15	Kohat	F13	FR Tanr	K21	Shargha	P26	Chana	S19	Tando Allahyar
B16	Ladakh	G1	Andar	K22	Swat	P27	Pakpattan	S20	Tando Mubarrak Khan
B17	Loralai	G2	Donar	K23	Tank	P28	Rohin Yar Khan	S21	Thokpur
B18	Mianwar	G3	Qandhar	K24	Upper Dir	P29	Rangpur	S22	Tsalia
B19	Muzaffargarh	G4	Qandhar	F1	Attock	P30	Rawalpindi	S23	Umerkot

Legend
Avalanche Hazard
Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low

Source: JICA Study Team


 The Project for National Disaster Management Plan in the Islamic Republic of Pakistan
 

Appendix-I Hazard & Risk Maps



No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Baigh	S02	Narabad	G0	Gilgit	P2	Bahawalnagar	P31	Sahiwal
A2	Bandera	S01	Mach	G6	Skardu	P3	Bahawalpur	P32	Sargodha
A3	Koll	S02	Pongor	G7	Muzaffargarh	P4	Bhakkar	P33	Shekhupura
A4	Mirpur	S02	Pishin	H	Islamabad	P5	Chakwal	P34	Sialkot
A5	Muzaffarabad	S04	Qadir	K1	Attock	P6	Cherat	P35	Toba Tek Singh
A6	Nowshera	S25	Sibi	K2	Banna	P7	D. G. Khan	P36	Yahian
A7	Poonch	S06	Jhelum	K3	Balochistan	P8	Faisalabad	S1	Badr
A8	Sudbut	S07	Zoet	K4	Dera	P9	Gujranwala	S2	Dadu
A9	Hafiz	S08	Wahai	K5	Charsadda	P10	Suport	S3	Ghota
A10	Havel	S05	Havel	K6	Chitral	P11	Hafizabad	S4	Hyderabad
D1	Awaran	S06	Sheras	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Bannu	B1	Deputed Area	K8	Hangu	P13	Jhelum	S6	Jaranwalla
B3	Botat	P1	Sagar Agency	K9	Hokair	P14	Kabul	S7	Kasur
B4	Chagai	P2	Khyber Agency	K10	Karac	P15	Khanewal	S8	Kashmir
B5	Dera Bugti	P5	Kurram Agency	K11	Kohat	P16	Khuzdabad	S9	Khalidpur
B6	Chowdar	P4	Mulawan Agency	K12	Kohistan	P17	Lahore	S10	Larkana
B7	Jalambad	P5	North Waziristan Agency	K13	Laki Mervat	P18	Leah	S11	Maler
B8	Jhel Nagri	P6	Orakzai Agency	K14	Lawal Di	P19	Lodhran	S12	Mirpur Khas
B9	Kalat	P7	South Waziristan Agency	K15	Makland	P20	Mandi Bahaudran	S13	Muzaffargarh
B10	Kach	P8	FR Bannu	K16	Manshera	P21	Mianwali	S14	Nawabshah
B11	Khanpur	P9	FR D. I. Khan	K17	Mardan	P22	Multan	S15	Gombor and Shahdadkot
B12	Khyber	P10	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Sarghar
B13	Kila Abdallah	P11	FR Lakai Mervat	K19	Peshawar	P24	Muzaffargarh	S17	Shekharpur
B14	Kila Sukkiah	P12	FR Peshawar	K20	Sawat	P25	Muzaffargarh	S18	Sukkur
B15	Kohla	P13	FR Tank	K21	Shangha	P26	Choa	S19	Tando Allahyar
B16	Ladakh	G1	Azore	K22	Sivas	P27	Pakistan	S20	Tando Mubarrat Khan
B17	Loral	G2	Domra	K23	Tank	P28	Robat Yar Khan	S21	Thokozar
B18	Mianpur	G3	Ghanche	K24	Upper Di	P29	Rajapur	S22	Tinhi
B19	Muzaffar	G4	Ghor	P1	Attock	P30	Rawalpind	S23	Unseror

Legend
GLOF Hazard Category
■ Very High
■ High
■ Very Low

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan

Table B-1 Relative Severity of Various Hazards per District (1)

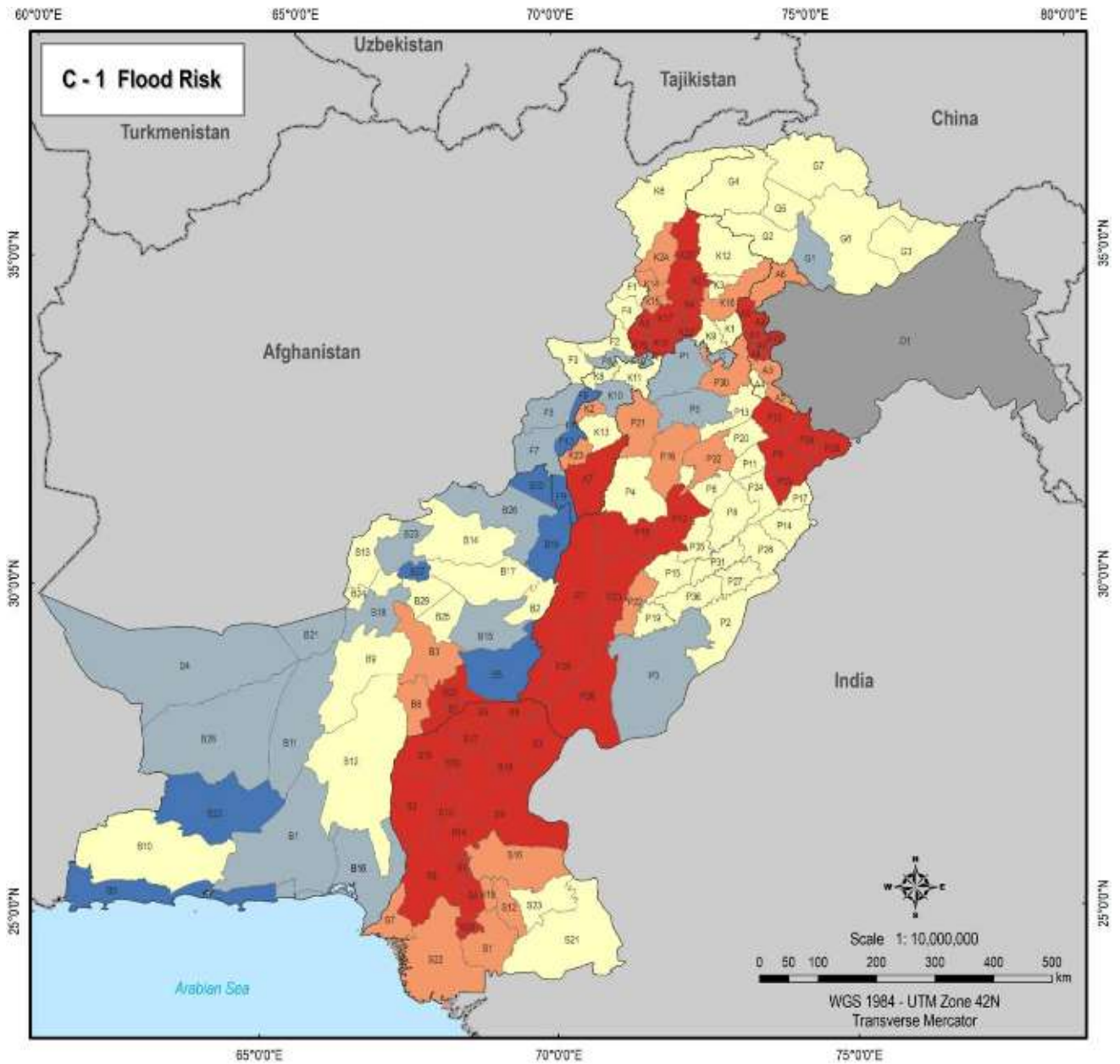
No.	Province	District	Flood Hazard	Landslide Hazard	Earthquake Hazard	Tsunami Hazard	Cyclone Hazard	Drought Hazard	Avlanche Hazard	GLDF Hazard
1	AJ.K	Bagh	4	3	3	-	1	3	3	1
2	AJ.K	Bhimber	3	3	3	-	1	4	1	1
3	AJ.K	Hattian	4	3	3	-	1	2	4	1
4	AJ.K	Haveli	4	3	3	-	1	3	3	1
5	AJ.K	Kotli	2	3	4	-	1	4	1	1
6	AJ.K	Mirpur	1	4	3	-	1	4	1	1
7	AJ.K	Muzaffarabad	4	3	3	-	1	2	4	4
8	AJ.K	Nee um	3	3	3	-	1	3	3	4
9	AJ.K	Poonch	2	3	4	-	1	3	1	1
10	AJ.K	Sudhnot	2	4	4	-	1	3	1	1
11	Ba ochistan	Awaran	1	3	3	-	2	3	1	1
12	Ba ochistan	Barkhan	2	2	4	-	1	4	1	1
13	Ba ochistan	Bolan	3	3	4	-	1	3	1	1
14	Ba ochistan	Chagai	2	3	2	-	1	3	1	1
15	Ba ochistan	Dera Bugti	1	1	4	-	1	4	1	1
16	Ba ochistan	Gwadar	3	3	4	3	3	3	1	1
17	Ba ochistan	Hama	3	2	4	-	1	4	1	1
18	Ba ochistan	Jafferabad	3	1	3	-	1	3	1	1
19	Ba ochistan	Jhel Magsi	4	1	3	-	1	3	1	1
20	Ba ochistan	Karai	2	3	4	-	1	4	1	1
21	Ba ochistan	Kech	3	3	3	-	4	3	1	1
22	Ba ochistan	Kharan	4	3	4	-	1	3	1	1
23	Ba ochistan	Khuadar	2	2	3	-	1	3	1	1
24	Ba ochistan	Killa Abdulah	2	2	4	-	1	4	1	1
25	Ba ochistan	Killa Saikulsh	2	3	4	-	1	4	1	1
26	Ba ochistan	Kohlu	2	3	4	-	1	4	1	1
27	Ba ochistan	Lasbeia	3	3	3	3	3	3	1	1
28	Ba ochistan	Loralai	2	3	4	-	1	4	1	1
29	Ba ochistan	Mastung	1	2	4	-	1	4	1	1
30	Ba ochistan	Musakhel	2	2	4	-	1	3	1	1
31	Ba ochistan	Nasirabad	3	1	4	-	1	3	1	1
32	Ba ochistan	Nushki	2	3	3	-	1	3	1	1
33	Ba ochistan	Panjgur	1	3	3	-	1	3	1	1
34	Ba ochistan	Pishin	1	2	3	-	1	4	1	1
35	Ba ochistan	Quetta	2	2	3	-	1	4	1	1
36	Ba ochistan	Sherani	1	2	4	-	1	3	1	1
37	Ba ochistan	Sibi	3	2	4	-	1	4	1	1
38	Ba ochistan	Washuk	4	3	4	-	1	3	1	1
39	Ba ochistan	Zhob	2	2	4	-	1	3	1	1
40	Ba ochistan	Ziarat	1	2	3	-	1	4	1	1
41	II	Capital Territory	1	3	3	-	1	3	1	1
42	D1	Disputed Area	1	3	3	-	1	-	4	4
43	FATA	Rajaur Agency	2	3	4	-	1	1	3	1
44	F8	FR Bannu	1	3	3	-	1	3	1	1
45	F9	FR D. I. Khan	1	2	4	-	1	4	1	1
46	F10	FR Kohat	1	3	3	-	1	3	1	1
47	F11	FR Laki Marwat	1	2	3	-	1	3	1	1
48	F12	FR Peshawar	1	3	3	-	1	4	1	1
49	F13	FR Tank	1	3	3	-	1	3	1	1
50	F2	Khyber Agency	2	4	3	-	1	4	3	1
51	F3	Kurum Agency	2	4	3	-	1	3	3	1
52	F4	Mohmand Agency	2	4	4	-	1	4	3	1
53	F5	North Waziristan Agency	1	4	3	-	1	4	1	1
54	F6	Orakzai Agency	1	4	3	-	1	4	1	1
55	F7	South Waziristan Agency	2	3	3	-	1	4	1	1
56	G1	Gilgit-Baltistan	3	4	4	-	1	-	3	4
57	G2	Gilgit-Baltistan	4	3	4	-	1	-	4	4
58	G3	Gilgit-Baltistan	4	4	4	-	1	-	4	3
59	G4	Gilgit-Baltistan	4	4	4	-	1	-	4	4
60	G5	Gilgit-Baltistan	4	4	4	-	1	-	4	4
61	G7	Gilgit-Baltistan	4	3	4	-	1	-	4	3
62	G6	Gilgit-Baltistan	4	4	4	-	1	-	3	3
63	K1	Khyber Pakhtunkhwa	2	3	4	-	1	2	1	1
64	K2	Khyber Pakhtunkhwa	2	3	3	-	1	2	1	1
65	K3	Khyber Pakhtunkhwa	2	4	4	-	1	2	3	4
66	K4	Khyber Pakhtunkhwa	3	4	3	-	1	2	3	1
67	K5	Khyber Pakhtunkhwa	3	4	3	-	1	1	3	1
68	K6	Khyber Pakhtunkhwa	3	3	3	-	1	2	3	3
69	K7	Khyber Pakhtunkhwa	3	1	2	-	1	3	1	1
70	K8	Khyber Pakhtunkhwa	2	4	3	-	1	3	1	1
71	K9	Khyber Pakhtunkhwa	2	3	3	-	1	1	3	1
72	K10	Khyber Pakhtunkhwa	2	4	3	-	1	4	1	1
73	K11	Khyber Pakhtunkhwa	2	3	3	-	1	3	1	1
74	K12	Khyber Pakhtunkhwa	4	3	4	-	1	2	3	4
75	K13	Khyber Pakhtunkhwa	2	3	3	-	1	2	1	1
76	K14	Khyber Pakhtunkhwa	3	4	4	-	1	1	3	1
77	K15	Khyber Pakhtunkhwa	3	3	4	-	1	1	3	1
78	K16	Khyber Pakhtunkhwa	3	3	4	-	1	1	3	4
79	K17	Khyber Pakhtunkhwa	3	4	3	-	1	1	3	1
80	K18	Khyber Pakhtunkhwa	4	4	3	-	1	2	2	1

Scoring Key	Very High	High	Medium	Low	Very Low	Non Hazard
	5	4	3	2	1	-

Table B-2 Relative Severity of Various Hazards per District (2)

No.	Province	District	Flood Hazard	Landslide Hazard	Earthquake Hazard	Tsunami Hazard	Cyclone Hazard	Drought Hazard	Avalanche Hazard	GLOF Hazard
81	K19	Khyber Pakhtunkhwa Peshawar	5	4	3	-	1	1	2	1
82	K20	Khyber Pakhtunkhwa Swat	4	4	4	-	1	2	3	4
83	K21	Khyber Pakhtunkhwa Shangha	5	4	4	-	1	3	3	4
84	K22	Khyber Pakhtunkhwa Swab	3	4	3	-	1	1	3	1
85	K23	Khyber Pakhtunkhwa Tank	4	1	3	-	1	4	1	1
86	K24	Khyber Pakhtunkhwa Upper Dir	4	3	4	-	1	2	4	4
87	P1	Punjab Attock	1	4	3	-	1	2	1	1
88	P2	Punjab Bahawalpur	1	2	2	-	1	2	1	1
89	P3	Punjab Bahawalpur	1	1	2	-	1	3	1	1
90	P4	Punjab Bhakkar	3	1	2	-	1	3	1	1
91	P5	Punjab Chakwal	1	3	3	-	1	3	1	1
92	P6	Punjab Chiniot	1	2	2	-	1	2	1	1
93	P7	Punjab D. G. Khan	5	2	2	-	1	3	1	1
94	P8	Punjab Faisalabad	1	2	2	-	1	2	1	1
95	P9	Punjab Gujranwala	3	3	2	-	1	1	1	1
96	P10	Punjab Gujrat	3	3	3	-	1	1	1	1
97	P11	Punjab Hafizabad	1	2	2	-	1	1	1	1
98	P12	Punjab Jhang	3	2	2	-	1	2	1	1
99	P13	Punjab Jhelum	1	3	3	-	1	1	1	1
100	P14	Punjab Kasur	1	2	2	-	1	1	1	1
101	P15	Punjab Khanewal	1	2	2	-	1	2	1	1
102	P16	Punjab Khushab	3	3	3	-	1	2	1	1
103	P17	Punjab Lahore	1	2	2	-	1	1	1	1
104	P18	Punjab Leiah	4	1	2	-	1	3	1	1
105	P19	Punjab Lodhian	1	2	2	-	1	2	1	1
106	P20	Punjab Mandi Bahaudin	1	2	3	-	1	1	1	1
107	P21	Punjab Mianwali	4	4	3	-	1	2	1	1
108	P22	Punjab Multan	2	2	2	-	1	2	1	1
109	P23	Punjab Muzaffargarh	4	1	2	-	1	2	1	1
110	P24	Punjab Nankana Sahib	1	3	2	-	1	2	1	1
111	P25	Punjab Nanowal	3	2	3	-	1	1	1	1
112	P26	Punjab Okara	1	1	3	-	1	2	1	1
113	P27	Punjab Pakpattan	1	2	2	-	1	2	1	1
114	P28	Punjab Rahim Yar Khan	4	1	2	-	1	4	1	1
115	P29	Punjab Rajanpur	5	1	2	-	1	3	1	1
116	P30	Punjab Rawalpindi	3	3	3	-	1	2	1	1
117	P31	Punjab Sahwal	1	2	2	-	1	2	1	1
118	P32	Punjab Sargodha	2	3	2	-	1	1	1	1
119	P33	Punjab Shekhpura	3	3	2	-	1	2	1	1
120	P34	Punjab Sialkot	3	2	3	-	1	1	1	1
121	P35	Punjab Toba Tek Singh	1	1	2	-	1	2	1	1
122	P36	Punjab Vehari	1	2	2	-	1	2	1	1
123	S1	Sindh Radn	3	1	3	-	3	3	1	1
124	S2	Sindh Dadu	5	2	2	-	1	3	1	1
125	S3	Sindh Ghotki	5	1	2	-	1	4	1	1
126	S4	Sindh Hyderabad	3	1	2	-	3	4	1	1
127	S5	Sindh Jacobabad	4	1	2	-	1	4	1	1
128	S6	Sindh Jamshoro	5	2	2	-	2	3	1	1
129	S7	Sindh Karachi	3	1	3	5	3	3	1	1
130	S8	Sindh Kashmore	4	1	2	-	1	4	1	1
131	S9	Sindh Khairpur	5	1	2	-	1	4	1	1
132	S10	Sindh Larkana	5	1	2	-	1	4	1	1
133	S11	Sindh Matiari	3	1	2	-	1	4	1	1
134	S12	Sindh Mirpur Khas	2	1	2	-	3	3	1	1
135	S13	Sindh Naushahro Feroze	3	1	2	-	1	3	1	1
136	S14	Sindh Nawatsah	3	1	2	-	2	4	1	1
137	S15	Sindh Qamber and Shahdadkot	5	2	3	-	1	4	1	1
138	S16	Sindh Sanghar	3	1	2	-	2	3	1	1
139	S17	Sindh Shikarpur	4	1	2	-	1	4	1	1
140	S18	Sindh Sukkur	4	1	2	-	1	4	1	1
141	S19	Sindh Tando Allahyar	2	1	2	-	3	4	1	1
142	S20	Sindh Tando Muhammed Khan	4	1	2	-	3	4	1	1
143	S21	Sindh Tharparkar	2	1	2	-	4	4	1	1
144	S22	Sindh Thatta	5	1	2	5	3	4	1	1
145	S23	Sindh Umerkot	2	1	2	-	3	4	1	1

Scoring Key	Very High	High	Medium	Low	Very Low	Non Hazard
	5	4	3	2	1	-



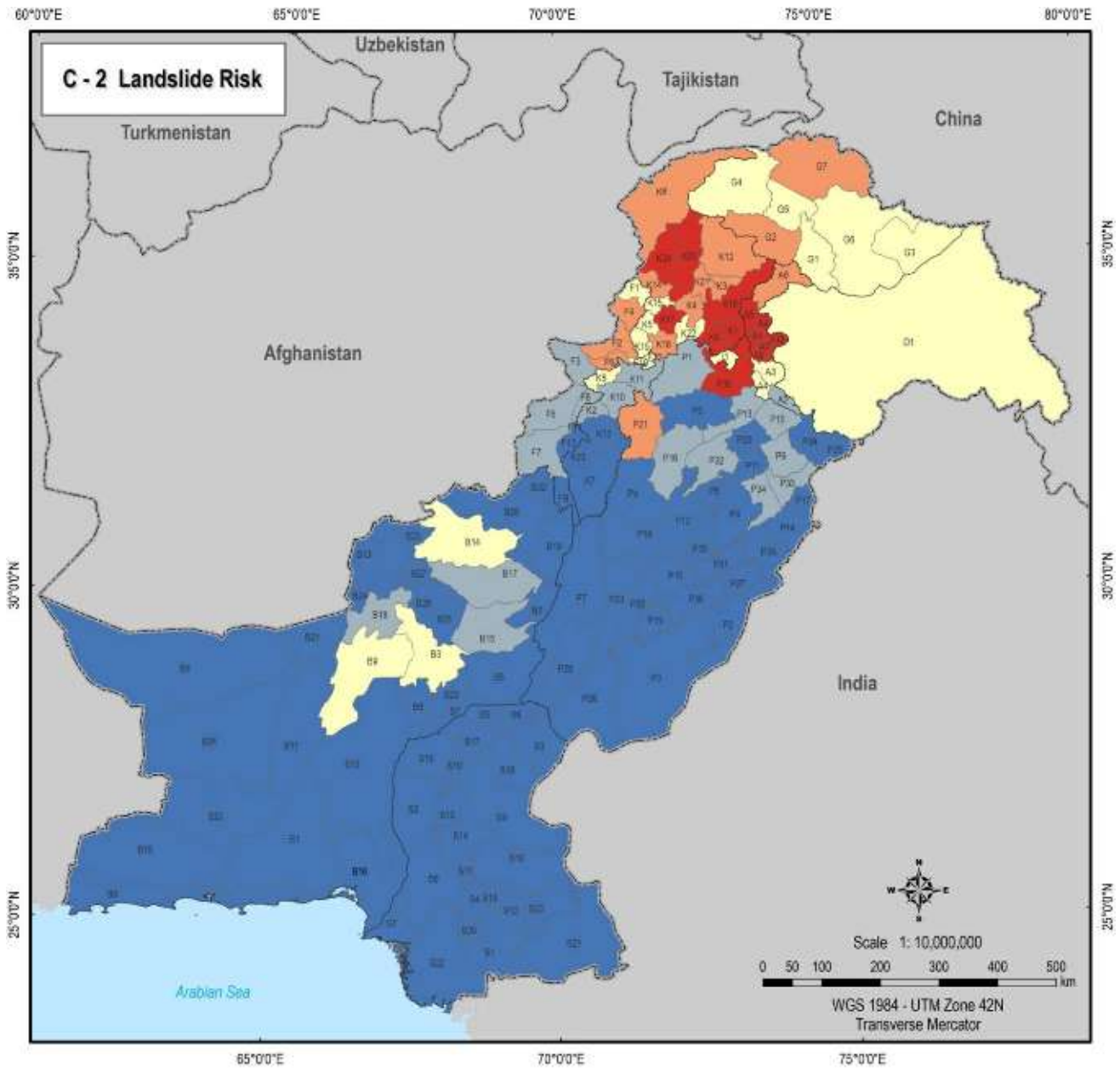
No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S25	Macerabad	G5	Gajit	P2	Suhrawalpur	P31	Sohawa
A2	Bamber	S21	Nattki	G6	Skardu	P3	Sohawalpur	P32	Sargotha
A3	Koh	S20	Pangar	G7	Huzar/Kupat	P4	Shikhar	P33	Sheikhupura
A4	Miyar	S23	Pelan	I1	Inderabad	P5	Chakwal	P34	Sialkot
A5	Muzaffarabad	S24	Guvli	K1	Astobabad	P6	Chandi	P35	Toba Tek Singh
A6	Washan	S25	Sibi	K2	Barau	P7	D. G. Khan	P36	Vahar
A7	Poonch	S26	Jhda	K3	Ilusgam	P8	Faisalabad	S1	Ilahi
A8	Sudhot	S27	Zavit	K4	Baner	P9	Sajawal	S2	Dadi
A9	Hattan	S28	Wothak	K5	Cherasatta	P10	Dugri	S3	Chini
A10	Trank	S29	Harka	K6	Chabi	P11	Hakrobad	S4	Hyderabad
B1	Awaran	S30	Shoran	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Bahawan	S31	Osaidi Area	K8	Hanga	P13	Jhelum	S6	Jarashan
B3	Bale	F1	Beas Agency	K9	Hinjar	P14	Kasur	S7	Kanoh
B4	Chago	F2	Rhyter Agency	K10	Karik	P15	Khanewal	S8	Kashmore
B5	Dera Bugt	F3	Kuram Agency	K11	Kohat	P16	Khusab	S9	Khanpur
B6	Gocebe	F4	Mohmand Agency	K12	Kohistan	P17	Lahore	S10	Lakhan
B7	Jalabad	F5	North Waziristan Agency	K13	Laki Mawal	P18	Lodhi	S11	Milbar
B8	Jhal Mags	F6	Orakza Agency	K14	Lower Dir	P19	Lodhian	S12	Milpur Khas
B9	Kalat	F7	South Waziristan Agency	K15	Makard	P20	Mandi Bahaudin	S13	Masohito Feroze
B10	Kash	F8	FR Barau	K16	Mandro	P21	Mianwali	S14	Nawabshah
B11	Khazir	F9	FR D. I. Khan	K17	Mardan	P22	Multan	S15	Dambor and Shahdadkot
B12	Kinabde	F10	FR Kohat	K18	Nawshera	P23	Muzaffargarh	S16	Singha
B13	Kila Ardakhan	F11	FR Laki Mawal	K19	Peshawar	P24	Nankana Sahib	S17	Srikanpur
B14	Kila Sakshan	F12	FR Pothohar	K20	Sayit	P25	Narawal	S18	Sukkur
B15	Kirthi	F13	FR Tanj	K21	Shangha	P26	Okas	S19	Tando Allahyar
B16	Ladiba	G1	Astara	K22	Swat	P27	Papoton	S20	Tando Muhammad Khan
B17	Lardip	G2	Danni	K23	Tank	P28	Rafiq Yar Khan	S21	Tharparkar
B18	Makrup	G3	Chunche	K24	Upper Dir	P29	Raopar	S22	Tulle
B19	Masohid	G4	Chow	F1	Attock	P30	Rawalpindi	S23	Trincoet

Legend
Flood Risk
Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low
■ No data

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan

Appendix-I Hazard & Risk Maps

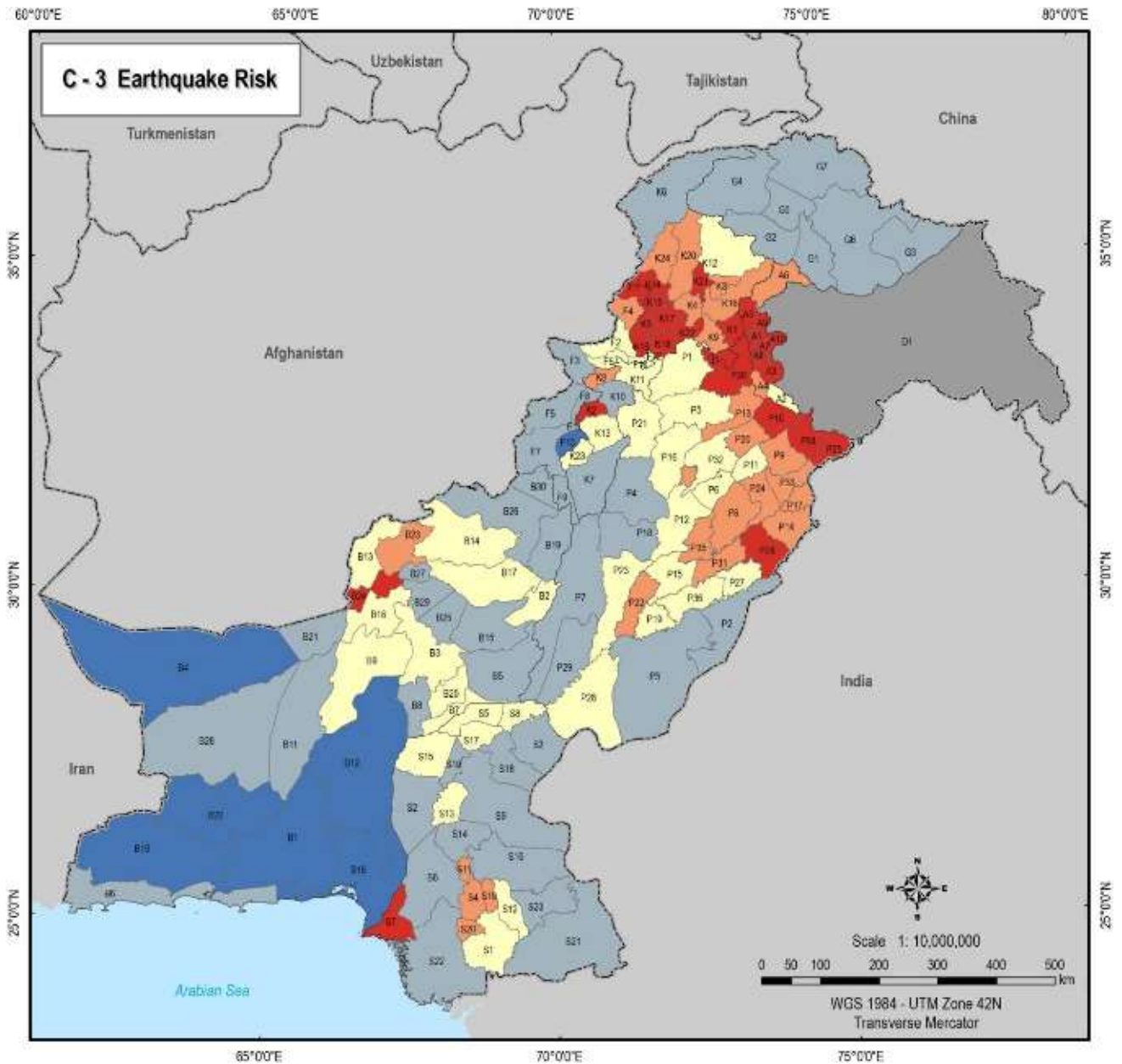


No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	300	Mardan	301	Gilgit	302	Sohawalpur	303	Sakhal
A2	Bhimbar	304	Muzaffargarh	305	Skardu	306	Sohawalpur	307	Sargodha
A3	Kali	308	Punjab	309	Muzaffargarh	310	Shikoh	311	Shekhpura
A4	Mirpur	312	Yahran	313	Muzaffargarh	314	Shikoh	315	Sialkot
A5	Muzaffargarh	316	Gudri	317	Attock	318	Chand	319	Toba Tek Singh
A6	Nowshera	320	Sibi	321	Bannu	322	D. G. Khan	323	Vahar
A7	Poonch	324	Jhelum	325	Rawalpindi	326	Faisalabad	327	Badr
A8	Sudkot	328	Zerat	329	Bannu	330	Sargodha	331	Dadu
A9	Hattian	332	Wahar	333	Chandab	334	Gujrat	335	Ghohi
A10	Tral	336	Harna	337	Chand	338	Hattian	339	Hyderabad
B1	Avatan	340	Sharna	341	D. I. Khan	342	Jhang	343	Jacobabad
B2	Bahawal	344	Dejlad Ania	345	Hanga	346	Baluch	347	Jandob
B3	Babar	348	Babar Agency	349	Hattian	350	Kara	351	Karachi
B4	Choga	352	Khyber Agency	353	Karak	354	Khawar	355	Kashmir
B5	Dera Bugti	356	Kuram Agency	357	Kohat	358	Khushab	359	Khatu
B6	Gawadar	360	Muzaffargarh Agency	361	Kohat	362	Lahore	363	Lahore
B7	Gharabat	364	North West Frontier Agency	365	Laki Mawan	366	Lahar	367	Mahar
B8	Jhal Magsi	368	Guzdar Agency	369	Lower Dir	370	Lodhran	371	Mirpur Khas
B9	Kalit	372	South West Frontier Agency	373	Makran	374	Muzaffargarh	375	Muzaffargarh
B10	Koch	376	FR Bannu	377	Mandera	378	Muzaffargarh	379	Nawabshah
B11	Khadan	380	FR D. I. Khan	381	Mardan	382	Multan	383	Gambhar and Strandbadot
B12	Khadan	384	FR Kalat	385	Nowshera	386	Muzaffargarh	387	Sarghar
B13	Kila Abdull	388	FR Laki Mawan	389	Peshawar	390	Muzaffargarh	391	Shikapur
B14	Kila Sakhan	392	FR Peshawar	393	Sawat	394	Muzaffargarh	395	Sakhar
B15	Kohli	396	FR Tank	397	Shanghar	398	Quetta	399	Tando Allahyar
B16	Ladki	400	Atrun	401	Swat	402	Pakistan	403	Tando Muhammad Khan
B17	Larkana	404	Daman	405	Tank	406	Rohar Yar Khan	407	Thaparhar
B18	Makhar	408	Gharhar	409	Upper Dir	410	Sarghar	411	Tudu
B19	Mankhar	412	Ghara	413	Attock	414	Sarghar	415	Jirahat

Legend
Landslide Risk
Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low
■ No data

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan



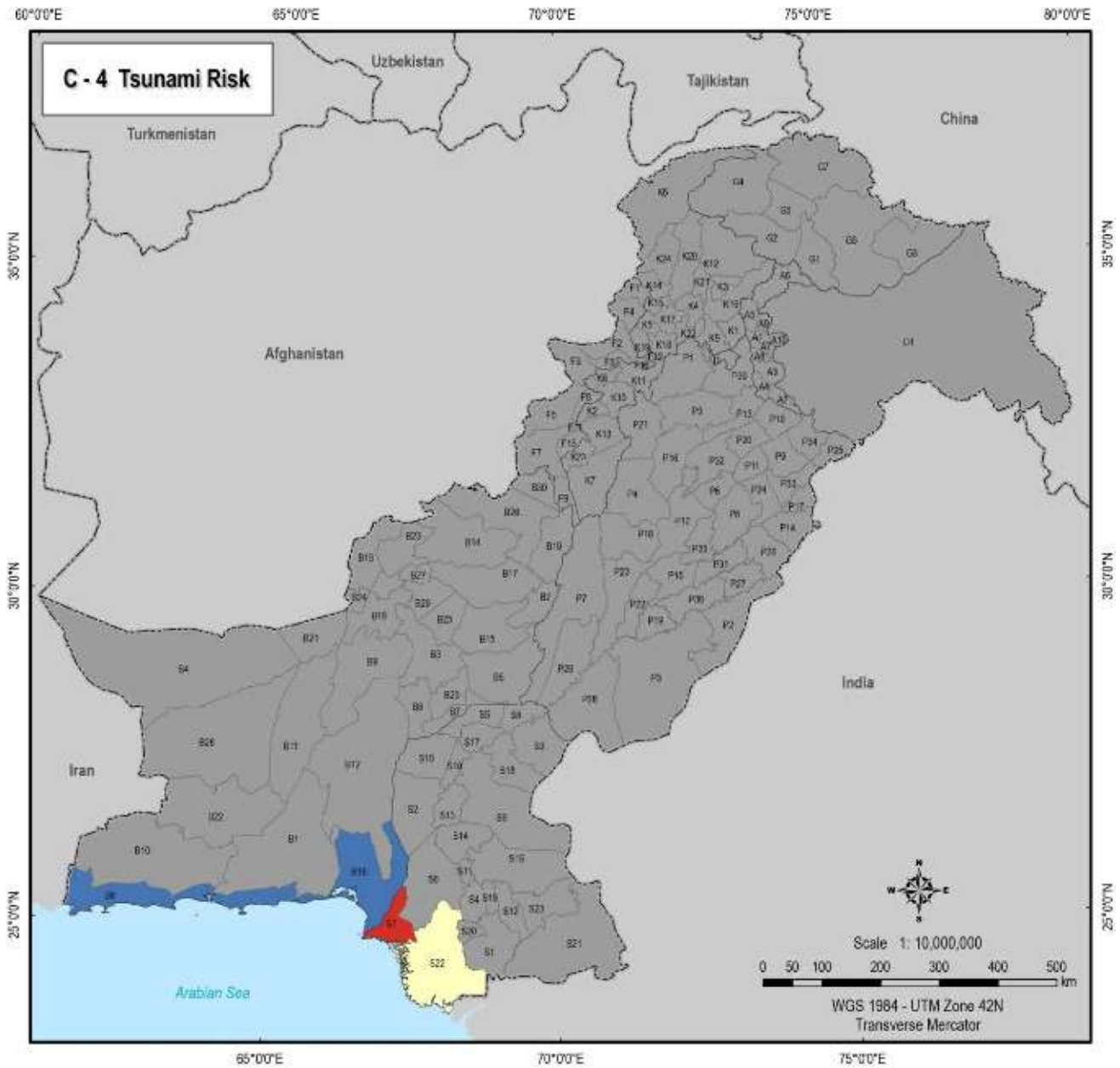
No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagi	S25	Nasirabad	G5	Gilgit	P2	Bohawalnagar	F31	Sahiwal
A2	Bamber	S21	Nasik	G6	Skardu	P3	Bahawalpur	F32	Sargodha
A3	Kali	S23	Pingir	G7	Truzkolgar	P4	Shekar	F33	Shekhpura
A4	Mipur	S20	Petin	G11	Islamabad	P5	Chakwal	F34	Sialkot
A5	Muzaffargarh	S24	Lodhi	K1	Attockabad	P6	Chiniot	F35	Toba Tek Singh
A6	Neelum	G25	Sibi	K2	Banna	P7	D. G. Khan	F36	Vahar
A7	Paoort	S22	Zhab	K3	Baogran	P8	Faisalabad	S1	Badin
A8	Sathel	S27	Danal	N4	Bareil	P9	Daryawala	S2	Dadu
A9	Hallen	S28	Wetruk	K5	Chenabde	P10	Gajral	S3	Chitral
A10	Hawal	S26	Hamal	K6	Chitral	P11	Hafizabad	S4	Hydrobad
B1	Anawan	S35	Shenan	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Badrin	B1	Decadal Area	K8	Jhang	P13	Jhelum	S6	Jamshoro
B3	Bakar	F1	Sagar Agency	K9	Faipur	P14	Kotak	S7	Kandah
B4	Chaga	F2	Khyber Agency	K10	Karak	P15	Khanawal	S8	Kashmore
B5	Dera Dugl	F3	Kumran Agency	K11	Kohat	P16	Khushab	S9	Khatour
B6	Gwadar	F4	Mohmand Agency	K12	Kaherlan	P17	Lahor	S10	Larkana
B7	Jalalabad	F5	North Wazirlan Agency	K13	Laki Mawal	P18	Lawal	S11	Multan
B8	Jhal Magl	F6	Drooz Agency	K14	Lower Dir	P19	Lofthan	S12	Mipur Khas
B9	Kalit	F7	South Wazirlan Agency	K15	Makand	P20	Mandi Bahaudin	S13	Nasrullo Farzla
B10	Kech	F8	FR Bannu	K16	Maraolal	P21	Mianwali	S14	Rawalshel
B11	Kheor	F9	FR D. I. Khan	K17	Mertan	P22	Multan	S15	Gamber and Shandkot
B12	Khudori	F10	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Sanghar
B13	Kila Abdaloh	F11	FR Laki Mawal	K19	Peshawar	P24	Nankana Sahel	S17	Sialkotpur
B14	Kila Saltoran	F12	FR Postowar	K20	Sawal	P25	Narawal	S18	Sialkur
B15	Kohat	F13	FR Sana	K21	Shanglu	P26	Okara	S19	Tando Allahyar
B16	Ladko	G1	Astora	K22	Sawal	P27	Pakapan	S20	Tando Muhammad Khan
B17	Lardk	G2	Domal	K23	Tank	P28	Rohin Yar Khan	S21	Tharpar
B18	Maring	G3	Shatcha	K24	Upper Dir	P29	Rangpur	S22	Thal
B19	Muzafgarh	G4	Gilow	P1	Abyk	P30	Rawalpindi	S23	Trinawal

Legend
Earthquake Risk
Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low
■ No data

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan

Appendix-I Hazard & Risk Maps



No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bugt	S02	Narabadi	G8	Gilgit	P2	Behawalpur	P31	Safdar
A2	Blanber	S01	Narhi	G6	Skardu	P3	Behawalpur	P32	Sargodha
A3	Kull	S02	Panjoor	O1	Hunza Nagar	P4	Shikhar	P33	Shekhupura
A4	Mipur	S02	Faizo	T1	Islamabad	P5	Chakwal	P34	Sialkot
A5	Muzaffabad	S04	Quila	K1	Attock	P6	Chenai	P35	Toba Tek Singh
A6	Noulan	S02	Sibi	K2	Bahau	P7	D. G. Khan	P36	Yahian
A7	Panoth	S08	Jhal	K3	Belgaon	P8	Faisalabad	B1	Badr
A8	Sudhrot	S07	Zawal	K4	Darar	P9	Gujranwala	B2	Dera
A9	Haban	S08	Wahlan	K5	Charsadda	P10	Sapat	B3	Ghudo
A10	Hansi	S08	Hansi	K8	Chitral	P11	Hafizabad	B4	Hyderabad
O1	Awami	S03	Shawal	K7	D. I. Khan	P12	Jhang	B5	Jacobabad
B2	Bannan	O1	Deputed Area	K8	Hangu	P13	Kelum	B6	Jalundhar
B1	Bolan	P1	Bajan Agency	K2	Hotair	P14	Kasur	B7	Karachi
B4	Chaghi	P3	Khyber Agency	K9	Karok	P15	Khanewal	B8	Kashmore
B5	Dera Bugt	P5	Kurram Agency	K11	Kohat	P16	Kushab	B9	Khanpur
B8	Gowadar	F4	Mairwan Agency	K12	Khatlan	P17	Lahore	S10	Larkana
O7	Jalundhar	F5	North Waziristan Agency	K13	Laki Marwat	P18	Leiah	S11	Malir
B8	Jhal Nagri	F6	Orakzai Agency	K14	Lawal Di	P19	Lodhran	S12	Mipur Khas
B8	Kalat	F7	South Waziristan Agency	K15	Makland	P20	Mandi Bahaudin	S13	Rashtree Pance
B10	Kach	F6	FR Bannu	K16	Marshehar	P21	Marshehar	S14	Rawatwan
B11	Kharan	F8	FR D. I. Khan	K17	Mardan	P22	Multan	S15	Gomber and Sindhkhot
B12	Khadar	F10	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Sarghar
B13	Kila Abdull	F11	FR Laki Marwat	K19	Peshawar	P24	Mankera Sahi	S17	Sialkot
B14	Kila Sukhan	F12	FR Peshawar	K20	Sawat	P25	Marsawal	S18	Sukkur
B15	Kohli	F13	FR Tank	K21	Shangha	P26	Chana	S19	Tando Allahyar
B16	Ladakh	G1	Azore	K22	Swat	P27	Pherozan	S20	Tando Muzammil Khan
B17	Larkai	G2	Daman	K23	Tank	P28	Rahim Yar Khan	S21	Tharparkar
B18	Meharaj	G3	Guracha	K24	Upper Di	P29	Rajapur	S22	Toba
B19	Muzaffar	G4	Gore	P1	Attock	P30	Rawalindi	S23	Tranrot

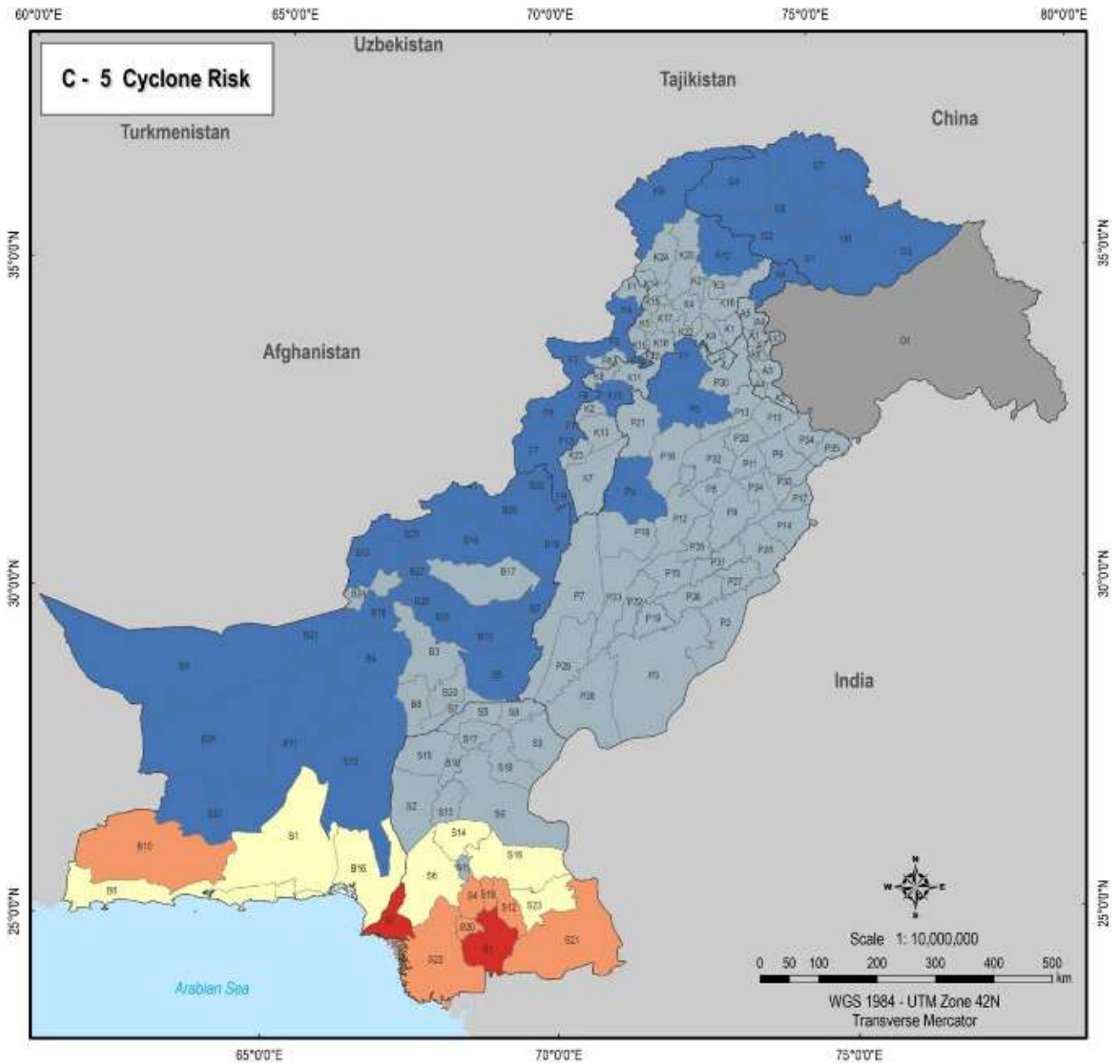
Legend

Tsunami Risk Category

- Very High
- Medium
- Low
- Very Low
- Non hazard

Source: JICA Study Team



The Project for National Disaster Management Plan in the Islamic Republic of Pakistan



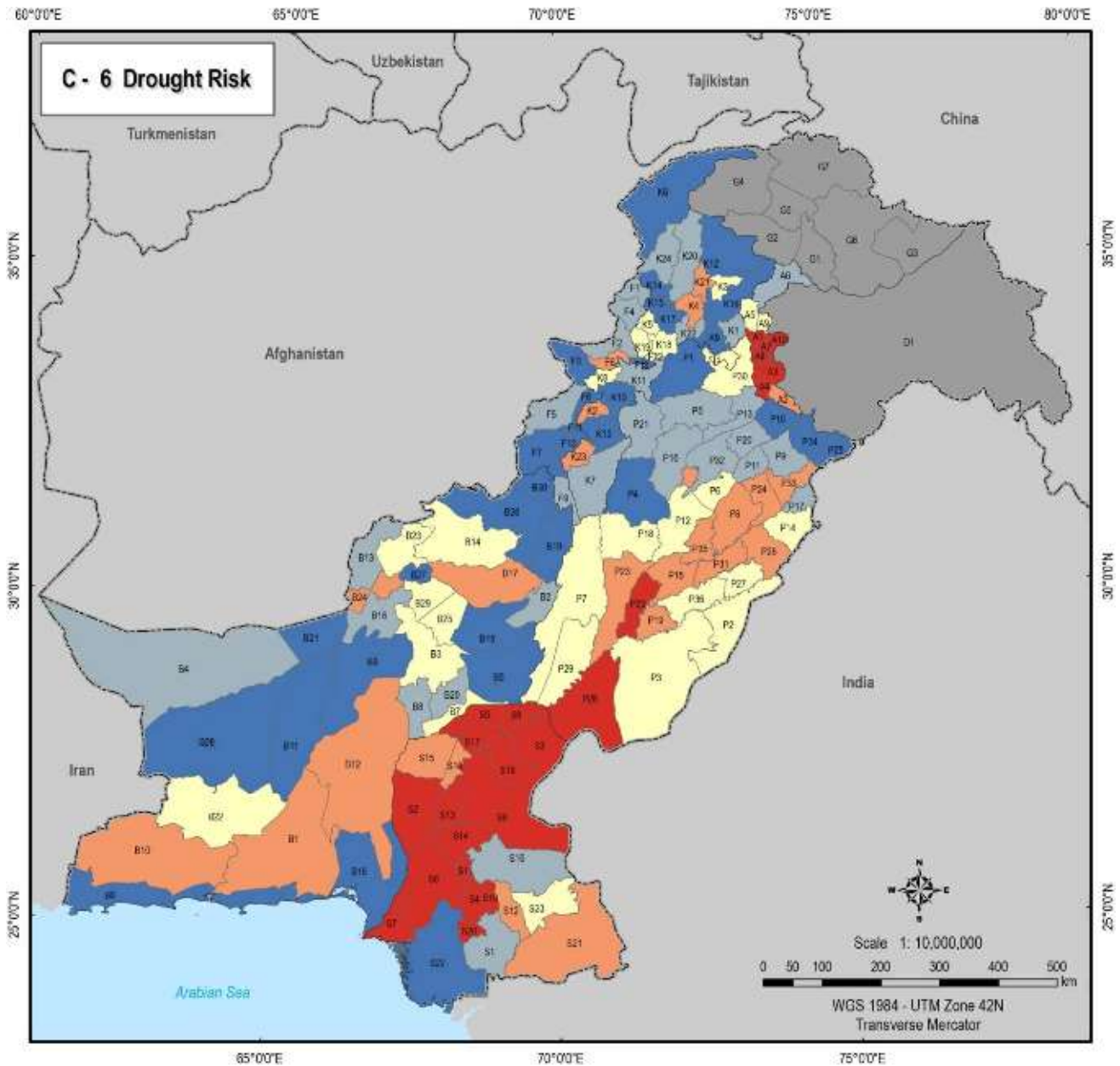
No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S20	Mardan	K5	Gajit	P2	Sohawalpur	P21	Sohawal
A2	Bhimbar	S21	Muzh	K6	Skardu	P3	Sonawapur	P22	Sargodha
A3	Koh	S22	Pingir	K7	Hunza-Nagar	P4	Shikar	P23	Shekhupura
A4	Mirpur	S23	Pesh	K8	Islamabad	P5	Chakwal	P24	Sialkot
A5	Muzaffargarh	S24	Quetta	K9	Attock	P6	Chiniot	P25	Toba Tek Singh
A6	Peshawar	S25	Sabi	K10	Baru	P7	D. G. Khan	P26	Wahai
A7	Punjab	S26	Jhal	K11	Balagam	P8	Faisalabad	S1	Radi
A8	Sudhot	S27	Savit	K12	Buner	P9	Gujranwala	S2	Dadi
A9	Hattan	S28	Wahai	K13	Chenab	P10	Durg	S3	Choki
A10	Iskhan	S29	Hama	K14	Chitral	P11	Hakimabad	S4	Hyderabad
B1	Avatan	S30	Shoran	K15	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Banhan	S31	Shekhar Arai	K16	Hangu	P13	Jhalan	S6	Jarcho
B3	Bolan	F1	Bolan Agency	K17	Hatru	P14	Kara	S7	Karachi
B4	Chaga	F2	Khyber Agency	K18	Karak	P15	Khanewal	S8	Kashmor
B5	Dera Bugt	F3	Kuram Agency	K19	Khat	P16	Khusab	S9	Khatpur
B6	Gawala	F4	Mirpur Agency	K20	Khanan	P17	Lahore	S10	Larkana
B7	Jahran	F5	North Waziristan Agency	K21	Laki Mawar	P18	Leah	S11	Milbi
B8	Jhal Mags	F6	Gulistan Agency	K22	Lower Di	P19	Lodhran	S12	Milpur Khai
B9	Kala	F7	South Waziristan Agency	K23	Makran	P20	Mandi Bahaudin	S13	Muzaffar Pur
B10	Koch	F8	FR Baru	K24	Manawan	P21	Mansoor	S14	Nawabshah
B11	Khan	F9	FR D. I. Khan	K25	Mardan	P22	Multan	S15	Combal and Shahdadkot
B12	Kinabdi	F10	FR Khat	K26	Nawawan	P23	Muzaffargarh	S16	Singhar
B13	Kira Abdal	F11	FR Laki Mawar	K27	Peshawar	P24	Mankana Sahi	S17	Sakapur
B14	Kira Sakhan	F12	FR Peshawar	K28	Savit	P25	Marsial	S18	Sakur
B15	Kirki	F13	FR Saki	K29	Shangha	P26	Okara	S19	Tando Allahyar
B16	Ladabi	G1	Atran	K30	Savit	P27	Pakistan	S20	Tando Muhammad Khan
B17	Larka	G2	Nami	K31	Tank	P28	Rohin Yar Khan	S21	Tharpar
B18	Makhar	G3	Shanhe	K32	Upper Di	P29	Ranapur	S22	Tuda
B19	Makhar	G4	Dhow	F1	Atok	P30	Rawalpor	S23	Tinawari

Legend
Cyclone Risk Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low
■ No data

Source: JICA Study Team


 The Project for National Disaster Management Plan in the Islamic Republic of Pakistan
 

Appendix-I Hazard & Risk Maps

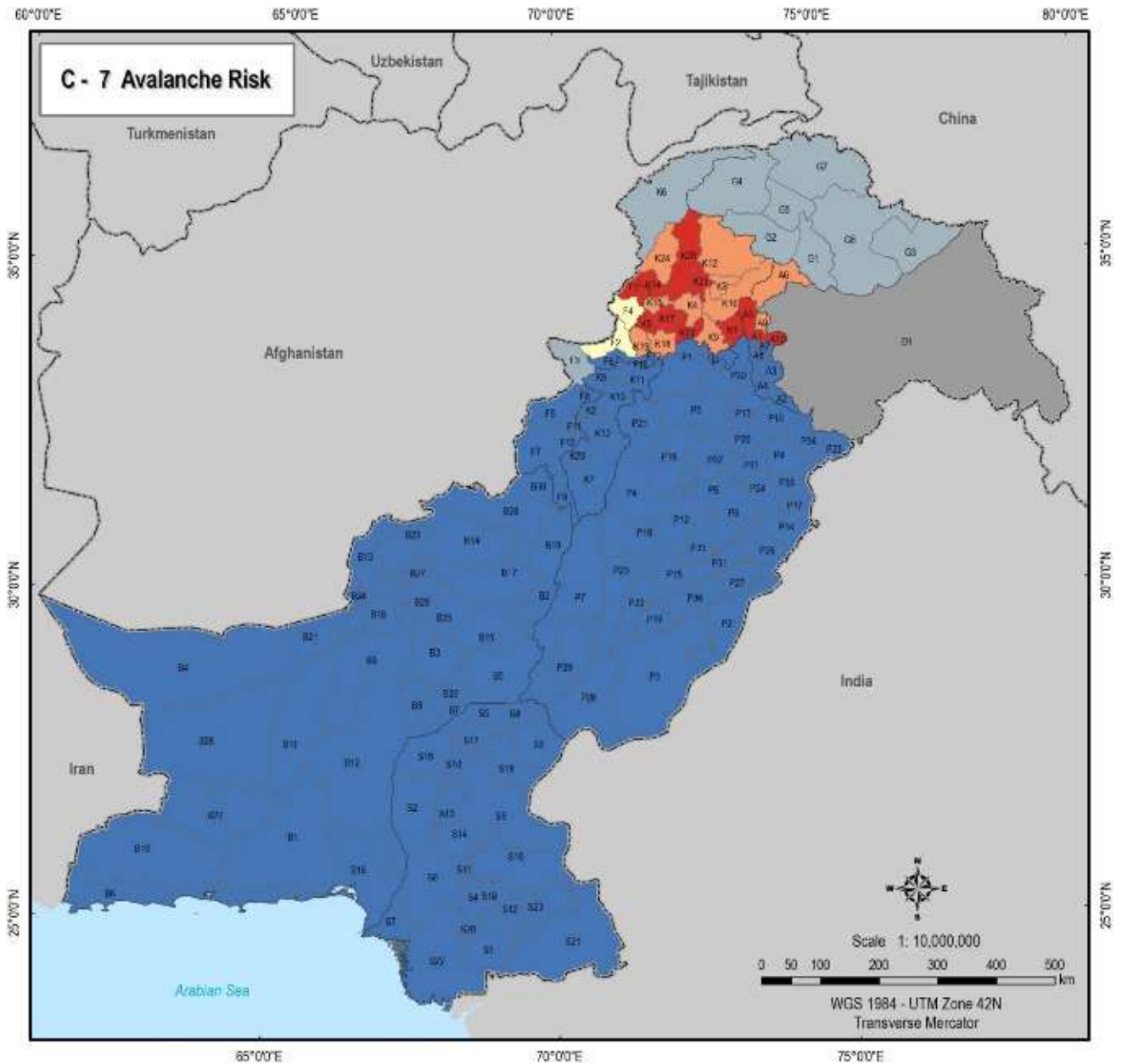


No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bajr	S02	Nasirabad	G06	Gilgit	P2	Bohawalnagar	P24	Sahiwal
A2	Bhinda	S01	Malki	G08	Skardu	P3	Bahawalpur	P32	Sargodha
A3	Kali	S02	Faqir	G7	Muzaffargarh	P4	Sheikhpura	P23	Sheikhpura
A4	Mipur	S03	Plehm	H	Islamabad	P5	Chokwal	P34	Sakot
A5	Muzaffarabad	S04	Quala	K11	Abbottabad	P6	Chenab	P35	Toba Tek Singh
A6	Neelum	S05	Sibi	K2	Rama	P7	D. G. Khan	P36	Yawan
A7	Poonch	S02	Zhab	K3	Dargoun	P8	Faisalabad	S1	Badin
A8	Sudhval	S07	Zanal	K4	Babar	P9	Supernova	S2	Dadu
A9	Haben	S08	Weshek	K5	Chenabde	P10	Gupat	S3	Ghaki
A10	Kawal	S02	Hama	K6	Chitral	P11	Hafizabad	S4	Hyderabad
B1	Anarwal	S32	Sheras	K7	D. I. Khan	P12	Jang	S5	Jacobabad
B2	Baitran	D1	Deccad Area	K8	Piang	P13	Jhelum	S6	Jamshoro
B3	Bokar	F1	Bajur Agency	K9	Haripur	P14	Kosur	S7	Karachi
B4	Chagai	F2	Khyber Agency	K10	Karim	P15	Khanawal	S8	Kashmore
B5	Dera Dagh	F3	Kumhar Agency	K11	Kohat	P16	Khuzhab	S9	Khanpur
B6	Gowadar	F4	Mohmand Agency	K12	Kahran	P17	Lahore	S10	Larkana
B7	Jalalabad	F5	North Waziristan Agency	K13	Lakki Marwat	P18	Lawan	S11	Multan
B8	Jhal Magal	F6	Drokoz Agency	K14	Lower Dir	P19	Lodhran	S12	Majur Khos
B9	Kalit	F7	South Waziristan Agency	K15	Malakand	P20	Mandi Bahaudin	S13	Muzaffarabad
B10	Kash	F8	FR Bara	K16	Mirpurkhas	P21	Mirpurkhas	S14	Nawabshah
B11	Khacur	F9	FR D. I. Khan	K17	Mardan	P22	Multan	S15	Gamber and Shikardot
B12	Khuzdar	F10	FR Kohat	K18	Nowshehra	P23	Muzaffargarh	S16	Sanghar
B13	Kila Abdallah	F11	FR Jhalu Mowal	K19	Peshawar	P24	Nankana Sahib	S17	Shekarpur
B14	Kila Saltun	F12	FR Peshawar	K20	Swat	P25	Narowal	S18	Sukkur
B15	Kahla	F13	FR Tanj	K21	Shanghu	P26	Okara	S19	Tando Allahyar
B16	Lebval	G11	Astora	K22	Swat	P27	Pakistan	S20	Tando Muhammad Khan
B17	Landi	G2	Domin	K23	Tank	P28	Rohat Yar Khan	S21	Tharparar
B18	Misling	G3	Gharache	K24	Upper Dir	P29	Rajapur	S22	Tulsh
B19	Munshval	G4	Ghore	P1	Attock	P30	Rawalpindi	S23	Harisrot

Legend
Drought Risk Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low
■ Non hazard

Source: JICA Study Team

JICA The Project for National Disaster Management Plan in the Islamic Republic of Pakistan



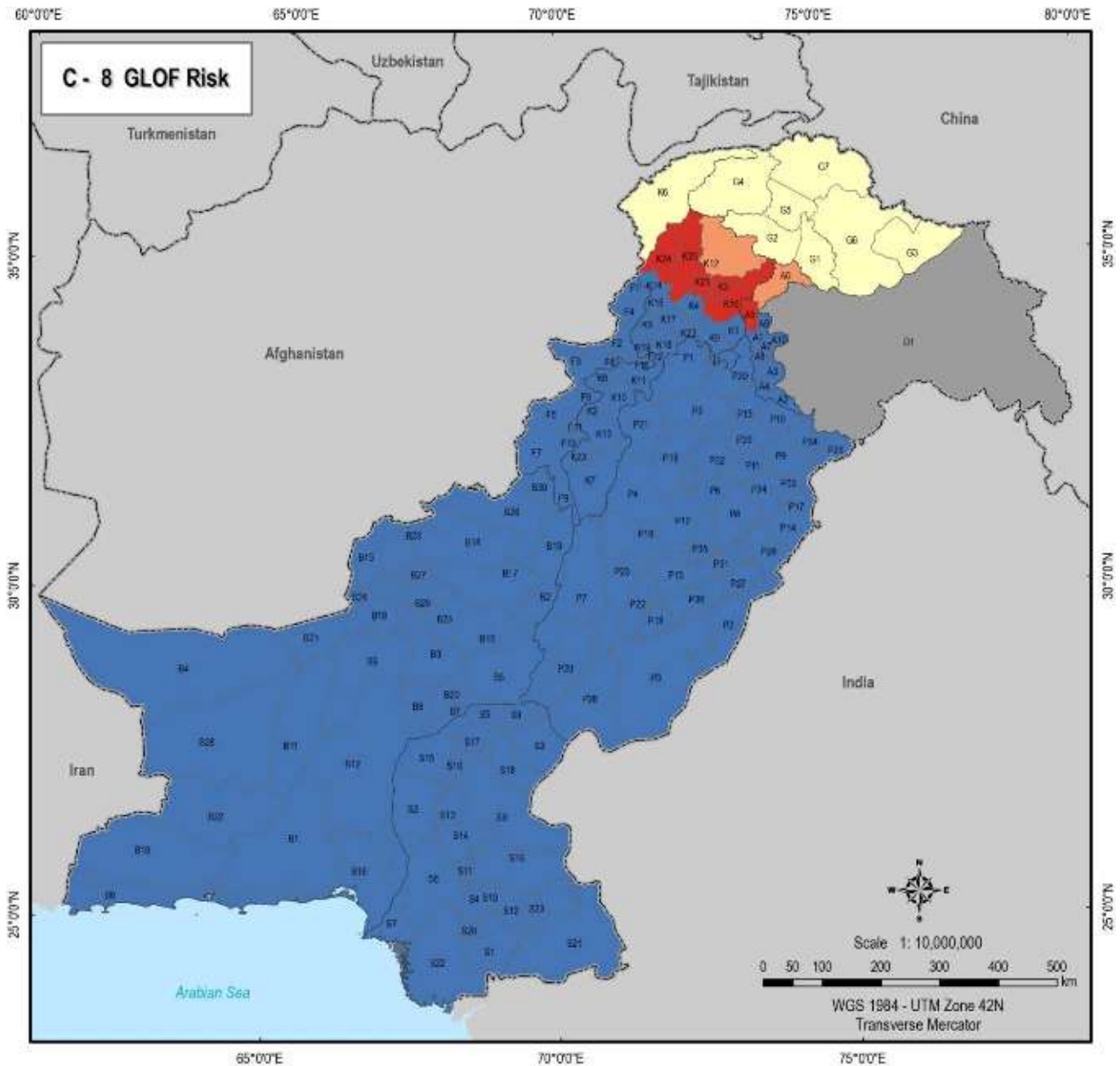
No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S22	Narabad	G6	Gilgit	P2	Bahawalpur	P31	Sahiwal
A2	Bamber	S21	Nasirko	O6	Skardu	P3	Bahawalpur	P32	Sargodha
A3	Kala	S20	Pingir	G1	Huzar-Nagar	P4	Shakar	P33	Shekhupura
A4	Miyar	S23	Petin	J1	Islamkot	P5	Chakwal	P34	Sialkot
A5	Muzaffarabad	S24	Qazil	K1	Attock	P6	Chiniot	P35	Toba Tek Singh
A6	Neelum	S25	Sibi	K2	Bara	P7	D. G. Khan	P36	Vehar
A7	Poonch	S26	Zhab	K3	Bangor	P8	Fatehobod	S1	Bade
A8	Sachrai	S27	Zinat	K4	Buniel	P9	Dupriwala	S2	Dadu
A9	Ilalain	S28	Wahruk	K5	Chenabde	P10	Dupri	S3	Ghosi
A10	Handi	S29	Handi	K6	Chiniot	P11	Hafizobod	S4	Hydrobad
B1	Anaizi	S30	Sharan	K7	D. I. Khan	P12	Jhang	S5	Jacobabad
B2	Barokan	S1	Desaid Area	K8	Haripur	P13	Jhelum	S6	Jamshoro
B3	Bolan	F1	Sagar Agency	K9	Haripur	P14	Kasur	S7	Karachi
B4	Chaga	F2	Khyber Agency	K10	Karak	P15	Khanewal	S8	Kashmir
B5	Dera Bugt	F3	Kumrat Agency	K11	Kohat	P16	Khushab	S9	Khatkhola
B6	Dowlat	F4	Wohmand Agency	K12	Kororan	P17	Lahore	S10	Larkana
B7	Jalalabad	F5	North Waziristan Agency	K13	Lakh-Manawal	P18	Lahar	S11	Makran
B8	Jhel Magi	F6	Goolzai Agency	K14	Lower Dir	P19	Lothian	S12	Mirpur Khas
B9	Kalat	F7	South Waziristan Agency	K15	Makrand	P20	Mandi Sahaidan	S13	Muzaffaro Farazi
B10	Kech	F8	FR Barau	K16	Marsiala	P21	Mianwali	S14	Muzaffarabad
B11	Kharon	FR	FR D. I. Khan	K17	Mardan	P22	Multan	S15	Comber and Shabkhot
B12	Khuzdar	FR	FR Kohat	K18	Nowshera	P23	Muzaffargarh	S16	Sarghar
B13	Kila Aradab	F11	FR Lakai Manawal	K19	Peshawar	P24	Nankana Sahib	S17	Sikandar
B14	Kila Salkish	F12	FR Postowar	K20	Sوات	P25	Narawal	S18	Sukkur
B15	Kulali	F13	FR Sani	K21	Shargha	P26	Chana	S19	Tanda Alviya
B16	Ladkha	G1	Astori	K22	Sوات	P27	Pakistan	S20	Tanda Muhammad Khan
B17	Larkana	G2	Dabir	K23	Tank	P28	Rohri Yar Khan	S21	Troonkar
B18	Mastung	G3	Shancho	K24	Upper Dir	P29	Rangpur	S22	Thale
B19	Marsiala	G4	Dow	P1	Attock	P30	Rawalpindi	S23	Timorez

Legend
Avalanche Risk Category
■ Very High
■ High
■ Medium
■ Low
■ Very Low
■ No data

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan

Appendix-I Hazard & Risk Maps

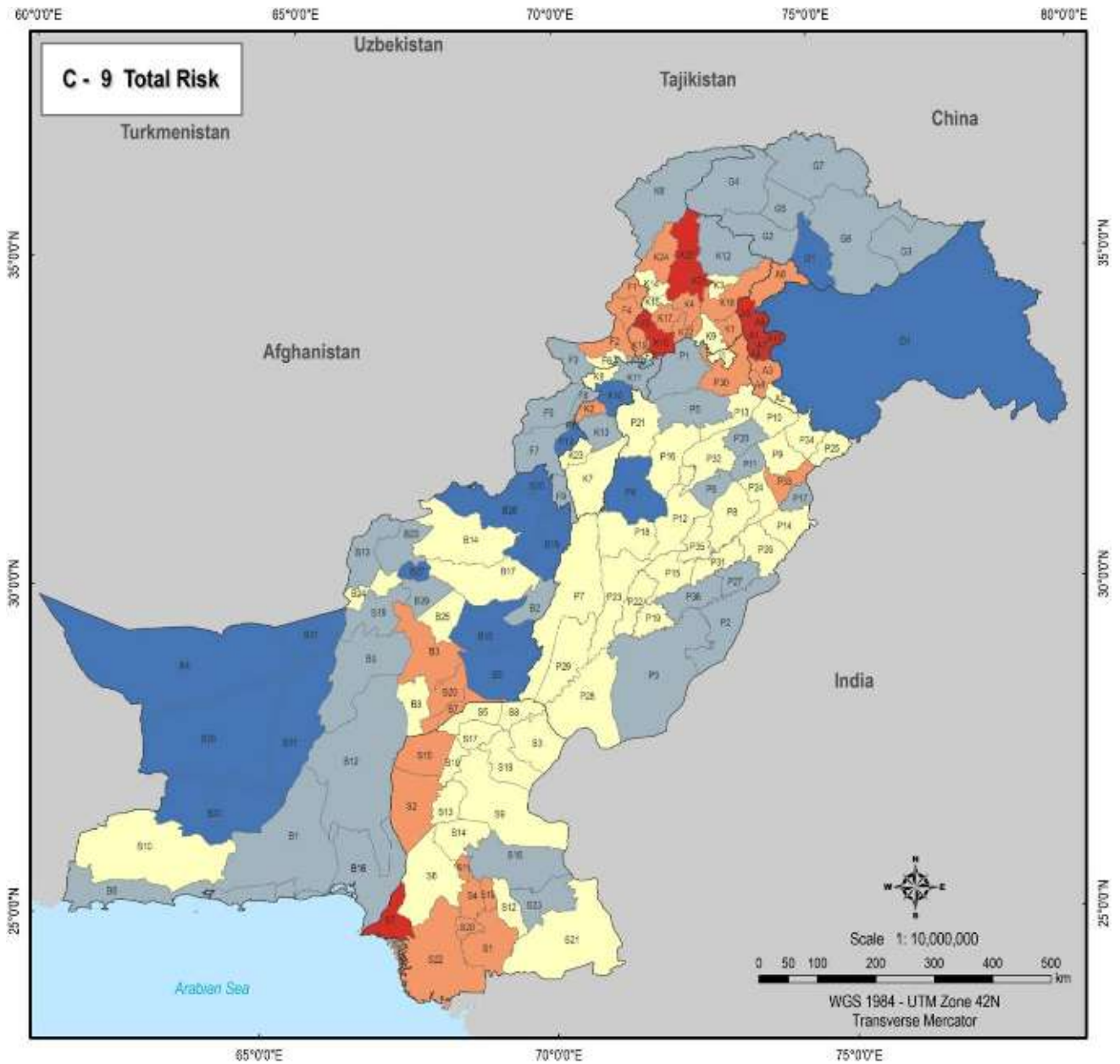


No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S05	Narozai	G01	Citral	P22	Behawalpur	P31	Sahiwal
A2	Bamher	S01	Mach	G06	Skardu	P03	Behawalpur	P32	Sargodha
A3	Koft	S02	Ferdos	G07	Pinjir Nagar	P04	Shikar	P33	Shikhanpur
A4	Mipur	S03	Pishin	H01	Islamabad	P05	Chakwal	P34	Sialkot
A5	Muzaffargarh	S04	Quetta	H02	Abbottabad	P06	Cherat	P35	Toba Tek Singh
A6	Nowshahr	S05	Sibi	H03	Bannu	P07	D. G. Khan	P36	Valmiki
A7	Panoch	S06	Jhal	H04	Raipur	P08	Faisalabad	P37	Badr
A8	Sahawal	S07	Zawal	H05	Darar	P09	Gujranwala	P38	Dadu
A9	Hafiz	S08	Washuk	H06	Charsadda	P10	Gujrat	P39	Ghosi
A10	Haveli	S09	Haveli	H07	Chitral	P11	Hafizabad	P40	Hyderabad
B1	Awaran	S10	Shewa	H08	D. I. Khan	P12	Jhang	P41	Jacobabad
B2	Bachchan	S11	Deputed Area	H09	Hangu	P13	Jhelum	P42	Jarchole
B3	Bolan	P1	Baqar Agency	H10	Hafizpur	P14	Kasur	P43	Karachi
B4	Chagai	P2	Khyber Agency	H11	Karim	P15	Khanewal	P44	Kashmir
B5	Dera Bugti	P3	Kurram Agency	H12	Kohat	P16	Khuzdabad	P45	Khalidpur
B6	Chowk	P4	Mohmand Agency	H13	Kohistan	P17	Lahore	P46	Larkana
B7	Jalalabad	P5	North Waziristan Agency	H14	Laki-Mansur	P18	Lahor	P47	Maler
B8	Jhal Magesi	P6	Dera Ismail Khan Agency	H15	Lower Dir	P19	Lodhran	P48	Mirpur Khas
B9	Kalat	P7	South Waziristan Agency	H16	Malakand	P20	Mandi Bahaudin	P49	Rasoolpur
B10	Kech	P8	FR Bara	H17	Mardan	P21	Mianwali	P50	Rawatpur
B11	Khanpur	P9	FR D. I. Khan	H18	Mardan	P22	Multan	P51	Gandker and Shahdadkot
B12	Khadar	P10	FR Kohat	H19	Nowshera	P23	Muzaffargarh	P52	Sarghar
B13	Kila Abdullah	P11	FR Laki Mawat	H20	Peshawar	P24	Mankana Sahib	P53	Shikarpur
B14	Kila Saikhan	P12	FR Peshawar	H21	Swat	P25	Narwal	P54	Sukkur
B15	Killa	P13	FR Tank	H22	Shangha	P26	Choa	P55	Tando Allahyar
B16	Lasbela	G1	Awaran	H23	Swat	P27	Pakpattan	P56	Tando Muhammad Khan
B17	Loralai	G2	Dera	H24	Tank	P28	Rohri Yar Khan	P57	Tharparkar
B18	Mehar	G3	Ghanche	H25	Upper Dir	P29	Rajpur	P58	Tulla
B19	Murshid	G4	Genoa	H26	Attock	P30	Rawalpindi	P59	Tarso

Legend
GLOF Risk Category
■ Very High
■ High
■ Medium
■ Very Low
■ No data

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan



No.	District Name	No.	District Name	No.	District Name	No.	District Name	No.	District Name
A1	Bagh	S22	Nasirabad	G1	Gilgit	P2	Sohawalnagar	P31	Sindhwa
A2	Bhimbar	S21	Nasik	G2	Skardu	P3	Sukkur	P32	Sargodha
A3	Koh	S23	Pingir	G7	Hunza Nagar	P4	Shekhar	P33	Shekharpur
A4	Miqar	S22	Pishin	H	Islamabad	P5	Chitral	P34	Sakot
A5	Muzaffargarh	S24	Quetta	K1	Attock	P6	Chitral	P35	Indus Valley
A6	Neelum	S25	Sibi	K2	Bannu	P7	D. G. Khan	P36	Veran
A7	Poonch	S26	Jhok	K3	Baigram	P8	Fakirabad	S1	Badin
A8	Sudhan	S27	Jhelum	K4	Burewala	P9	Gajnowale	S2	Dadu
A9	Hattian	S28	Wazirabad	K5	Chenab	P10	Gujrat	S3	Ghok
A10	Haveli	S29	Haveli	K6	Chitral	P11	Hattian	S4	Hydrabad
B1	Anaran	S30	Shenas	K7	D. I. Khan	P12	Uhang	S5	Jacobabad
B2	Barkhan	S1	Deputed Area	K8	Hangu	P13	Jhelum	S6	Jamshoro
B3	Bolan	F1	Southern Agency	K9	Haveli	P14	Kaer	S7	Kandahar
B4	Chaga	F2	Khyber Agency	K10	Karak	P15	Khanewal	S8	Kashmir
B5	Dera Bugti	F3	Kurram Agency	K11	Kohat	P16	Khanpur	S9	Khanpur
B6	Devala	F4	North-West Frontier Agency	K12	Kohistan	P17	Lahore	S10	Larkana
B7	Jhelum	F5	North-West Frontier Agency	K13	Laki Mervat	P18	Lyallpur	S11	Makran
B8	Jhelum	F6	South-West Frontier Agency	K14	Lower Dir	P19	Lodhran	S12	Mirpur Khas
B9	Kalat	F7	South-West Frontier Agency	K15	Makran	P20	Mandi Bahaudin	S13	Muzaffargarh
B10	Kashmir	F8	IR D. I. Khan	K16	Mardan	P21	Mansherwah	S14	Nasirabad
B11	Khanpur	F9	IR D. I. Khan	K17	Mardan	P22	Multan	S15	Comber and Shahdadi
B12	Khanpur	F10	IR Kohat	K18	Rawalpindi	P23	Muzaffargarh	S16	Rangpur
B13	Kila Abdulla	F11	IR Laki Mervat	K19	Peshawar	P24	Nankana Sahib	S17	Shekhar
B14	Kila Saifullah	F12	IR Peshawar	K20	Sوات	P25	Narwal	S18	Sakhar
B15	Kohat	F13	IR Saki	K21	Shargha	P26	Okara	S19	Tando Allahyar
B16	Lahore	G1	Ajmer	K22	Saidu	P27	Pakistan	S20	Tando Muhammad Khan
B17	Larkana	G2	Derna	K23	Tank	P28	Rahim Yar Khan	S21	Thokhar
B18	Mianwali	G3	Shekhar	K24	Upper Dir	P29	Rashtari	S22	Tulla
B19	Muzaffargarh	G4	Derna	P1	Attock	P30	Rawalpindi	S23	Trawala

Legend

Total Risk

- Very High
- High
- Medium
- Low
- Very Low
- No data

Source: JICA Study Team

The Project for National Disaster Management Plan in the Islamic Republic of Pakistan

Table C-1 Relative Severity of Various Risks per District (1)

Appendix-I Hazard & Risk Maps

Rank No.	No.	Province	District	Flood Risk	Land/Sea Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche Risk	GLoF Risk	PDMA Policy	Total Risk
1	S7	Sindh	Korachi	4	1	3	-	2	3	1	1	1	20
2	A8	A.J.K	Huttan	3	3	3	-	2	3	4	1	1	20
3	A5	A.J.K	Muzaffargarh	3	3	3	-	2	3	4	1	1	20
4	K18	Khyber Pakhtunkhawa	Kowshehra	3	4	3	-	2	3	4	1	1	20
5	A1	A.J.K	Bagh	3	3	3	-	2	3	4	1	1	20
6	A10	A.J.K	Haveli	3	4	3	-	2	3	4	1	1	20
7	A7	A.J.K	Ferozpur	3	3	3	-	2	3	4	1	1	20
8	A8	A.J.K	Sudhnot	3	3	3	-	2	3	4	1	1	20
9	K5	Khyber Pakhtunkhawa	Charsadda	3	3	3	-	2	3	4	1	1	20
10	K20	Khyber Pakhtunkhawa	Sawal	3	3	4	-	2	3	4	1	1	20
11	K21	Khyber Pakhtunkhawa	Shangha	3	4	3	-	2	3	4	1	1	20
12	K16	Khyber Pakhtunkhawa	Mansehra	4	3	4	-	2	3	4	1	1	21
13	A3	A.J.K	Kotli	4	3	3	-	2	3	4	1	1	20
14	A6	A.J.K	Neelum	4	4	4	-	1	2	4	4	1	20
15	G3	Balochistan	Bolan	4	3	3	-	2	3	1	1	1	20
16	F1	FATA	Bajaur Agency	3	3	3	-	2	2	3	1	1	20
17	K4	Khyber Pakhtunkhawa	Buner	3	4	4	-	2	4	4	1	1	20
18	P30	Punjab	Rawalpindi	4	3	3	-	2	3	1	1	1	20
19	S1	Sindh	Badin	4	1	3	-	2	2	1	1	1	20
20	S2	Sindh	Dadu	3	1	2	-	2	3	1	1	1	20
21	S4	Sindh	Hyderabad	3	1	4	-	4	3	1	1	1	20
22	S15	Sindh	Quamber and Shandakot	4	1	3	-	2	4	1	1	1	20
23	S20	Sindh	Tando Muhammad Khan	3	1	4	-	4	3	1	1	1	20
24	S22	Sindh	Thatta	4	1	2	3	4	1	1	1	1	20
25	B7	Balochistan	Jaffarabad	3	1	3	-	2	3	1	1	1	19
26	F4	FATA	Mohmand Agency	3	4	4	-	1	2	3	1	1	19
27	K17	Khyber Pakhtunkhawa	Mardan	3	3	3	-	2	1	3	1	1	19
28	K19	Khyber Pakhtunkhawa	Peshawar	3	3	3	-	2	3	4	1	1	19
29	S19	Sindh	Tando Allahyar	4	1	4	-	4	3	1	1	1	19
30	A4	A.J.K	Mipur	3	3	4	-	2	3	1	1	1	18
31	B20	Balochistan	Nasirabad	3	1	3	-	2	2	1	1	1	18
32	F2	FATA	Khyber Agency	3	4	3	-	1	2	3	1	1	18
33	K1	Khyber Pakhtunkhawa	Abbotabad	3	3	3	-	2	2	3	1	1	18
34	K2	Khyber Pakhtunkhawa	Bannu	4	2	3	-	2	4	1	1	1	18
35	K22	Khyber Pakhtunkhawa	Sawal	3	3	3	-	2	2	3	1	1	18
36	K24	Khyber Pakhtunkhawa	Upper Dir	4	3	4	-	2	2	4	3	1	18
37	P33	Punjab	Shekhupura	4	2	4	-	2	4	1	1	1	18
38	S11	Sindh	Matan	3	1	4	-	2	3	1	1	1	18
39	K3	Khyber Pakhtunkhawa	Dataganj	3	4	4	-	2	3	4	3	1	17
40	K7	Khyber Pakhtunkhawa	D. I. Khan	3	1	2	-	2	2	1	1	1	17
41	K14	Khyber Pakhtunkhawa	Lower Dir	4	4	3	-	2	1	3	1	1	17
42	P22	Punjab	Multan	4	1	4	-	2	3	1	1	1	17
43	P28	Punjab	Rahim Yar Khan	3	1	3	-	2	3	1	1	1	17
44	S6	Sindh	Jacobabad	3	1	3	-	2	3	1	1	1	17
45	S6	Sindh	Jamshoro	3	1	2	-	3	3	1	1	1	17
46	S8	Sindh	Kashmore	3	1	3	-	2	3	1	1	1	17
47	S12	Sindh	Mipur Khas	4	1	3	-	4	4	1	1	1	17
48	S13	Sindh	Naushahro Feroze	3	1	3	-	2	3	1	1	1	17
49	S14	Sindh	Nowshahr	3	1	2	-	3	3	1	1	1	17
50	S17	Sindh	Shikarpur	3	1	3	-	2	3	1	1	1	17
51	A2	A.J.K	Bhimber	4	2	3	-	2	4	1	1	1	16
52	B8	Balochistan	Jhal Magsi	4	1	2	-	2	2	1	1	1	16
53	B74	Balochistan	Quetta	3	1	3	-	2	4	1	1	1	16
54	H	Capital Territory	Islamabad	2	3	3	-	2	3	1	1	1	16
55	H6	FATA	Dera Ismail Khan Agency	2	4	3	-	2	4	1	1	1	16
56	K8	Khyber Pakhtunkhawa	Hangu	3	3	4	-	2	3	1	1	1	16
57	K8	Khyber Pakhtunkhawa	Hafizpur	3	3	4	-	2	1	4	1	1	16
58	K15	Khyber Pakhtunkhawa	Malakand	4	3	3	-	2	1	4	1	1	16
59	P9	Punjab	Cujankasa	3	2	4	-	2	2	1	1	1	16
60	P10	Punjab	Cujat	3	2	3	-	2	1	1	1	1	16
61	P21	Punjab	Mianwali	4	4	3	-	2	2	1	1	1	16
62	P23	Punjab	Muzaffargarh	3	1	3	-	2	4	1	1	1	16
63	P24	Punjab	Nankana Sahib	3	2	4	-	2	4	1	1	1	16
64	P26	Punjab	Okara	3	1	3	-	2	4	1	1	1	16
65	S3	Sindh	Grozi	3	1	2	-	2	3	1	1	1	16
66	S8	Sindh	Kharpur	3	1	2	-	2	3	1	1	1	16
67	S18	Sindh	Sukkur	3	1	2	-	2	3	1	1	1	16
68	G17	Balochistan	Loralai	3	2	3	-	2	4	1	1	1	15
69	G25	Balochistan	Sib	3	1	2	-	1	3	1	1	1	15
70	K23	Khyber Pakhtunkhawa	Tank	4	1	3	-	2	4	1	1	1	15
71	P0	Punjab	Faisalabad	3	1	4	-	2	4	1	1	1	15
72	P12	Punjab	Unjha	3	1	3	-	2	3	1	1	1	15
73	P25	Punjab	Narowal	3	1	3	-	2	1	1	1	1	15
74	P31	Punjab	Sohawal	3	1	4	-	2	4	1	1	1	15
75	P34	Punjab	Sialkot	3	1	3	-	2	1	1	1	1	15
76	P35	Punjab	Toba Tek Singh	3	1	4	-	2	4	1	1	1	15
77	S10	Sindh	Larkana	3	1	2	-	2	4	1	1	1	15
78	S21	Sindh	Tharparkar	3	1	2	-	4	4	1	1	1	15
79	B10	Balochistan	Kochi	3	1	1	-	4	4	1	1	1	14
80	B14	Balochistan	Killa Saifullah	3	3	3	-	1	3	1	1	1	14

Scoring Key	Very High	High	Medium	Low	Very Low	Non Hazard
	5	4	3	2	1	-

Table C-2 Relative Severity of Various Risks per District (2)

Rank No.	No.	Province	District	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche Risk	GLOF Risk	POWAs Policy	Total Risk
81	F12	FATA	FR Peshawar	2	3	3	-	2	3	1	1	1	14
82	F7	Punjab	D. G. Khan	3	1	2	-	2	3	1	1	1	14
83	P13	Punjab	Jhelum	3	2	4	-	2	2	1	1	1	14
84	P14	Punjab	Kasur	3	1	4	-	2	3	1	1	1	14
85	P15	Punjab	Khanewal	3	1	3	-	2	4	1	1	1	14
86	P16	Punjab	Khushab	4	2	3	-	2	2	1	1	1	14
87	P18	Punjab	Lahar	3	1	2	-	2	3	1	1	1	14
88	P19	Punjab	Lodhran	3	1	3	-	2	4	1	1	1	14
89	P25	Punjab	Rajapur	3	1	2	-	2	3	1	1	1	14
90	P32	Punjab	Sargodha	4	2	3	-	2	2	1	1	1	14
91	F7	FATA	South Waziristan Agency	2	2	2	-	1	1	1	1	3	13
92	K11	Khyber Pakhtunkhwa	Kohat	3	2	3	-	2	2	1	1	1	13
93	K12	Khyber Pakhtunkhwa	Kohistan	3	4	3	-	1	1	4	4	1	13
94	F6	Punjab	Chinot	3	1	3	-	2	3	1	1	1	13
95	P17	Punjab	Lahore	3	1	4	-	2	2	1	1	1	13
96	P20	Punjab	Mandi Bahauddin	3	1	4	-	2	2	1	1	1	13
97	P27	Punjab	Pakpattan	3	1	3	-	2	3	1	1	1	13
98	P35	Punjab	Vehar	3	1	3	-	2	3	1	1	1	13
99	S16	Sindh	Saighar	4	1	2	-	3	2	1	1	1	13
100	S23	Sindh	Umerkot	3	1	2	-	3	3	1	1	1	13
101	B1	Balochistan	Awaran	2	1	1	-	3	4	1	1	1	12
102	B9	Balochistan	Kalat	3	3	3	-	1	1	1	1	1	12
103	B25	Balochistan	Pishin	2	1	4	-	1	3	1	1	1	12
104	F9	FATA	FR D. I. Khan	1	1	2	-	1	2	1	1	3	12
105	K5	Khyber Pakhtunkhwa	Chitral	3	4	2	-	1	1	2	3	1	12
106	F2	Punjab	Bahawalnagar	3	1	2	-	2	3	1	1	1	12
107	P11	Punjab	Faisalabad	3	1	3	-	2	2	1	1	1	12
108	B2	Balochistan	Barkhan	3	1	3	-	1	2	1	1	1	11
109	B25	Balochistan	Hama	3	1	2	-	1	3	1	1	1	11
110	B12	Balochistan	Khrandar	3	1	1	-	1	4	1	1	1	11
111	B13	Balochistan	Killa Abdullah	3	1	3	-	1	2	1	1	1	11
112	B18	Balochistan	Mastung	2	2	3	-	1	2	1	1	1	11
113	F10	FATA	FR Kohat	2	3	3	-	1	1	1	1	1	11
114	G2	Gilg-Baltistan	Damir	3	4	2	-	1	-	2	3	1	11
115	G7	Gilg-Baltistan	Hunza-Nagar	3	4	2	-	1	-	2	3	1	11
116	K13	Khyber Pakhtunkhwa	Lakki Marwat	3	1	3	-	2	1	1	1	1	11
117	F3	Punjab	Bahawalpur	2	1	2	-	2	3	1	1	1	11
118	B6	Balochistan	Gwadar	1	1	2	1	3	1	1	1	1	10
119	B16	Balochistan	Lasbela	2	1	1	1	3	1	1	1	1	10
120	F8	FATA	FR Bannu	1	2	2	-	1	1	1	1	3	10
121	F3	FATA	Kurram Agency	3	2	2	-	1	1	2	1	1	10
122	F5	FATA	North Waziristan Agency	2	2	2	-	1	2	1	1	1	10
123	G3	Gilg-Baltistan	Gharcho	3	3	2	-	1	-	2	3	1	10
124	G4	Gilg-Baltistan	Ghizer	3	3	2	-	1	-	2	3	1	10
125	G6	Gilg-Baltistan	Gilgit	3	3	2	-	1	-	2	3	1	10
126	G8	Gilg-Baltistan	Skardu	3	3	2	-	1	-	2	3	1	10
127	P1	Punjab	Attock	2	2	3	-	1	1	1	1	1	10
128	F5	Punjab	Chakwal	2	1	3	-	1	2	1	1	1	10
129	B15	Balochistan	Kohlu	2	2	2	-	1	1	1	1	1	9
130	G1	Gilg-Baltistan	Astore	2	3	2	-	1	-	2	3	1	9
131	K10	Khyber Pakhtunkhwa	Karak	2	2	2	-	1	1	1	1	1	9
132	P4	Punjab	Shekhar	3	1	2	-	1	3	1	1	1	9
133	B4	Balochistan	Chagai	2	1	1	-	1	2	1	1	1	8
134	B11	Balochistan	Khanan	2	1	2	-	1	1	1	1	1	8
135	B21	Balochistan	Nushki	2	1	2	-	1	1	1	1	1	8
136	B22	Balochistan	Panjgur	1	1	1	-	1	3	1	1	1	8
137	B38	Balochistan	Wadhuk	2	1	2	-	1	1	1	1	1	8
138	B26	Balochistan	Zhob	2	1	2	-	1	1	1	1	1	8
139	F13	FATA	FR Tank	1	1	1	-	1	1	1	1	3	8
140	B5	Balochistan	Dera Bugti	1	1	2	-	1	1	1	1	1	7
141	B19	Balochistan	Musakhel	1	1	2	-	1	1	1	1	1	7
142	B30	Balochistan	Sherani	1	1	2	-	1	1	1	1	1	7
143	B27	Balochistan	Ziarat	1	1	2	-	1	1	1	1	1	7
144	F11	FATA	FR Lakki Marwat	1	1	2	-	1	1	1	1	1	7
145	D1	Disputed Area	Disputed Area	-	3	-	-	-	-	-	-	1	4

Scoring Key	Very High	High	Medium	Low	Very Low	Non Hazard
	5	4	3	2	1	-

APPENDIX – II

Roles & Responsibilities

(Geological Hazards and Meteorological Hazards)

Disaster Management Authorities	
NDMA	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Coordinate complete spectrum of disaster risk management at the national level. 2) Act as Secretariat of the NDMC to facilitate implementation of DRM strategies. 3) Develop hazard specific maps and provide to F/G/S/PDMAS, DDMA and make it available on NDMA/F/G/S/PDMAS websites. 4) Develop guidelines and standards for national and provincial stakeholders regarding their role in disaster risk management. 5) Ensure establishment of DM Authorities and Emergency Operations Centres at provincial, district, and municipal levels in hazard-prone areas. 6) Provide technical assistance to federal ministries, departments and provincial DM authorities for disaster risk management initiatives. 7) Prepare National Disaster Management Plan. 8) Prepare Emergency Preparedness Plan. 9) Prepare Multi Hazards and Disaster Specific Contingency Plan. 10) Establish communication mechanisms for the early warning system with F/G/S/PDMAS, DDMA and concerned ministries and departments. 11) Share the contingency plan with NDMC, relevant federal ministries, authorities, departments, commissions, F/G/S/PDMAs, DDMA, I/NGOs, Armed Forces, media, voluntary and charity Organizations. 12) Provide technical assistance for preparing Disaster Management Plans for each province including AJ&K, Northern Area & FATA. 13) Set up a national emergency operation centre and maintain state of readiness with all equipment in working order. Orient and train personnel of EOC. 14) Develop national search and rescue, emergency response and early recovery operations teams. 15) Set up national level I/NGOs UN coordination committee having representation from the F/G/S/PDMAs for sharing of resources and coordination for preparedness and emergency response. 16) Prepare and update inventory of personnel, suppliers, materials and equipment. 17) Prepare communication and transportation plan for potential disaster response. 18) Develop a communication strategy that clearly indicates the communication mechanisms with relevant federal ministries, departments, provincial departments, F/G/S/PDMAs, DDMA and district level administration and departments, I/NGOs, civil society Organizations, media and communities. 19) Prepare security guidelines for humanitarian Organizations working in the disaster affected areas (for insecure areas where conflict and kidnapping are common). 20) Organize training and awareness raising activities for capacity development of stakeholders, particularly in hazard-prone areas in consultation with and active involvement of PDMAs. 21) Collect, analyze, process, and disseminate inter-sectoral information required in an all hazard management approaches. 22) Ensure appropriate regulations are framed to develop disaster response volunteer teams. 23) Create requisite environment for participation of media in DRM activities. 24) Serve as the lead agency for NGOs to ensure their performance matches accepted international standards, e.g., the SPHERE standards.

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(Geological Hazards and Meteorological Hazards)*

	<p>25) Serve as the lead agency for international cooperation in disaster risk management. This will specifically include, information sharing, early warning, surveillance, joint training, and common standards and protocols required for regional and international cooperation.</p> <p>26) Declare a National Disaster Awareness Day (to commemorate 08 October Earthquake) and conduct awareness raising activities on the occasion.</p> <p>27) Establish a National Disaster Management Fund.</p> <p>28) Advise institutionalization of staff and allocation of budgets for conducting Community-based Disaster Risk Management (CBDRM) Activities at the district level.</p> <p>29) Perform any other function as may be required by the NDMC.</p> <p><u>Emergency Response Phase</u></p> <p>1) Activate NEOC.</p> <p>2) Coordinate emergency response of the federal government in the event of a national level disaster through the National Emergency Operations Centre (NEOC).</p> <p>3) Require any government department or agency to make available such staff or resources that are available for the purpose of emergency response, rescue and relief.</p> <p>4) Organize initial and subsequent assessment of disaster affected areas and determine the extent of loss damage and volume and relief required.</p> <p>5) Coordinate and inform all concerned departments to get prepared for emergency response. Keep print and electronic media updated on a regular basis.</p> <p>6) Coordinate with Armed Forces through JS HQ and Service HQ.</p> <p>7) Collect information on damage status through F/G/S/PDMAS and promptly plan for the resources required for full relief operation.</p> <p>8) Coordinate with I/NGOs, UN bodies and philanthropist Organizations for resource mobilizations.</p> <p>9) Mobilize and deploy resources, e.g., search and rescue medical teams in the affected areas.</p> <p>10) Supply of food, drinking water, medical supplies and non-food items to the affected population.</p> <p>11) Organize a detailed assessment for the early recovery Program and prepare a proposal and circulate it to the NMDC, multi and bilateral donors, UN, I/NGOs and philanthropists.</p> <p>12) Prepare a transition plan from relief to recovery Program.</p> <p>13) Organize regular media and public information briefings.</p> <p>14) Prepare Situation Reports (SITREP) on daily and weekly bases and circulate to the Prime Minister, NDMC members, PMDC members, F/G/S/PDMAs, Armed Forces, etc.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Decide fundamental orientation of rehabilitation and reconstruction.</p> <p>2) Decide policy on rehabilitating damaged facilities.</p> <p>3) Support for treatment of debris in disaster affected area.</p> <p>4) Formulate Reconstruction Plan.</p> <p>5) Assist policy making for developing cities safe from disasters.</p> <p>6) Assist policy making for livelihood restoration of disaster victims.</p> <p>7) Assist policy making for reconstruction of small and medium-sized enterprises and economic recovery.</p>
<p>F/G/S/PDMAs</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Coordinate complete spectrum of disasters in the province/region.</p> <p>2) Prepare provincial/regional/state Disaster Risk Management Plan.</p>

*Appendix-II Roles & Responsibilities
(Geological Hazards and Meteorological Hazards)*

	<ol style="list-style-type: none">3) Prepare emergency preparedness and hazard specific contingency plan.4) Lay down communication mechanisms for early warning system with DDMA and concerned departments.5) Assist and provide information to the NDMA to develop hazard specific maps.6) Continuously monitor hazards, risks and vulnerable conditions within the province/region/state.7) Develop guidelines and standards for provincial/regional/state and local stakeholders regarding their role in disaster risk management.8) Ensure preparation of Disaster Risk Management Plans by all districts.9) Coordinate implementation of provincial Disaster Risk Management Plan in accordance with the National Disaster Management Plan.10) Promote education, awareness and training on disaster risk reduction and response.11) Provide necessary technical assistance and advice to local authorities for carrying out their functions effectively.12) Develop specific capabilities to manage threats that exist in the province/region.13) Set up a provincial emergency operations centre and maintain a state of readiness with all equipment in working order. Orient and train personnel on EOC and its operations.14) Develop provincial search and rescue, emergency response and early recovery operation teams.15) Establish provincial/equivalent level I/NGOs, UN coordination committee for sharing of resources and coordination for preparedness and emergency response.16) Identify high-risk areas, population and prepare vulnerability profiles and contingency plans accordingly.17) Ensure that each district has prepared a multi hazard and disaster/agency specific contingency plan to deal with the potential disaster.18) Provide technical, financial and human resources support to districts for disaster preparedness and emergency response activities.19) Carry out survey of public buildings for use as shelter and relief centres during disaster times. Make sure that these buildings have basic facilities, e.g., water, sanitation, etc.20) Set up a provincial level EOC and maintain a state of readiness with all equipment in working order. Orient and train personnel on EOC and its operations.21) Organize training for DDMA teams, volunteers, Civil Defence to cover first aid, dissemination of warnings, search and rescue, relief and recovery.22) Conduct training on disaster preparedness and emergency response for the district, taluka/tehsil level government officials, elected councilors, etc.23) Develop a communication strategy which clearly indicates the interaction mechanism with key provincial departments, district level administration, NDMA, concerned departments at federal level, I/NGOs, civil society Organizations, media and communities.24) Prepare security guidelines for humanitarian Organizations working in affected areas (in case of insecure areas where conflict and kidnappings are common).25) Ensure institutionalization of staff and allocation of budgets for conducting Community-based Disaster Risk Management (CBDRM) Activities at the district level.26) Perform such other functions as may be assigned by the
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*Appendix-II Roles & Responsibilities
(Geological Hazards and Meteorological Hazards)*

	<p>Provincial/Regional Commission.</p> <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Activate P/R/SEOC. 2) Coordinate emergency response in the event of a disaster, through the Provincial/Regional Emergency Operation Centre (P/R/SEOC). 3) Disseminate early warning information to all stakeholders. 4) Conduct rapid assessment and launch quick response. 5) Collect information on damage status through DDMA and promptly plan for the resource requirement for relief operation and share it with NDMA. 6) Provide food, drinking water, medical supplies, and non-food items to the affected population. 7) Keep NEOC abreast of the latest situation. 8) Warn all concerned departments to prepare for emergency response. 9) Coordinate with NDMA and Armed Forces and keep them informed on the situation and resource mobilization. 10) Keep print and electronic media updated on a regular basis. 11) Liaise with I/NGOs, UN bodies and philanthropists Organizations for resource mobilizations for emergency response. 12) Coordinate with districts to mobilize community volunteer groups for emergency operations. 13) Organize regular media and public information briefings. 14) Forward Situation Reports (SITREP) on daily and weekly bases to Chief Minister, governor, PDMC/equivalent members, NDMA, Armed Forces, etc. 15) Organize initial and subsequent assessment of disaster affected areas and determine the extent of loss damage and volume and relief required. 16) Organize a detailed assessment for the early recovery Program and prepare proposal and circulate it to the PMDC, NDMA, UN and I/NGOs. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction. 2) Decide policy on rehabilitating damaged facilities. 3) Support for treatment of debris in disaster-affected area. 4) Formulate Reconstruction Plan. 5) Decide policy on developing cities safe from disasters. 6) Decide policy on livelihood restoration of disaster victims. 7) Decide policy on reconstruction of small and medium-sized enterprises and economic recovery.
<p>DDMAs</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare the district Disaster Management Plan. 2) Prepare emergency preparedness and hazard specific contingency plan. 3) Review development plans of government departments and provide guidance on mainstreaming disaster risk reduction measures in these plans. 4) Continuously monitor hazards, risks and vulnerable conditions within the district, municipality, or cantonment areas. 5) Develop search and rescue, evacuation and emergency response teams at the district level. 6) Prepare guidelines and standards for local stakeholders on disaster risk reduction. 7) Identify high-risk geographical areas and communities and prepare a vulnerability resource profile for each community under UCs. 8) Prepare hazard and risk maps for public distribution. 9) Institutionalize staff and allocate budgets for conducting CBDRM

	<p>activities in smaller units under UCs.</p> <ol style="list-style-type: none"> 10) Conduct education, training and public awareness programs for local officials, stakeholders and communities. 11) Encourage involvement of community groups in disaster risk reduction and response by providing them with the necessary financial and technical assistance for implementing community level initiatives. 12) Examine construction in the area and if hazard safety standards have not been followed, direct the relevant entities to secure compliance of such standards. 13) Conduct a survey of public buildings for use as shelter and relief centres during disaster times. Ensure that these buildings have basic facilities, e.g., water, sanitation, etc. 14) Maintain an updated inventory of personnel, volunteers, material and equipment at UC, tehsil/taluka and district levels. 15) Organize and facilitate community level training and awareness programs on disaster preparedness and emergency response. 16) Develop a communication system for disseminating early warning information to the end user. 17) Stock pile rescue and relief material or ensure preparedness to make such material available at short notice. 18) Encourage participation of non-governmental Organizations and voluntary social welfare Organizations and communities in different aspects of preparedness and emergency response. 19) Promote an indigenous system and practices on disaster preparedness and emergency response. 20) Conduct drills and training on disaster preparedness and emergency response for the government officials, elected councilors, communities, volunteers, CBOs/NGOs, etc. 21) Invest in specific capabilities according the requirement to manage all types of threats peculiar to the local area and prepare a planning database for each community under UCs. 22) Undertake appropriate preparedness measures at the district level, e.g., maintain an early warning system, identify buildings to be used as evacuation sites, stockpile relief and rescue materials and identify alternative means for emergency communications. 23) Maintain linkages with the Provincial Disaster Management Authority and the Relief Department. 24) Perform such other functions as the Provincial Authority may assign to it. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Activate DEOC. 2) In the event of a disaster, organize emergency response through the District Emergency Operation Centre (DEOC). 3) Warn all district level departments to get ready for emergency response. 4) Inform P/R/SEOC and NEOC about the situation. 5) Organize evacuation on priority basis. 6) Conduct initial and subsequent assessment of disaster affected areas and determine the extent of loss and damage. 7) Collect information on damage status and promptly plan for the resource requirements for relief operation and share it with the PMDA and NDMA. 8) Provide food, drinking water, medical supplies, and non-food items to the affected population. 9) Deploy medical, search and rescue and emergency response teams immediately.
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	<ol style="list-style-type: none"> 10) Set up relief camps and provide relief in the camps. 11) Coordinate with F/G/S/PDMAS and NDMA to deploy resources for emergency response. 12) Mobilize community volunteer groups for emergency operations. 13) Liaise with I/NGOs, UN bodies and philanthropist Organizations for resource mobilizations for response. 14) Develop a complaint mechanism system and set up the complaint mechanism cell in the DEOC and at the sub district level. 15) Hold regular media and public information briefings. 16) Arrange a detailed assessment for the early recovery Program and prepare proposal and submit to F/G/S/PDMAS and NDMA. 17) Forward Situation Reports (SITREP) on daily and weekly bases to the F/G/S/PDMAS, NDMA, Armed Forces, etc. 18) Provide resource staff to conduct disaster risk management education at evacuation sites. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction. 2) Decide policy on rehabilitating damaged facilities. 3) Implement treatment of debris in disaster affected area. 4) Formulate a Reconstruction Plan. 5) Decide policy on developing cities safe from disasters. 6) Decide policy on livelihood restoration of disaster victims. 7) Decide policy on reconstruction of small and medium-sized enterprises and economic recovery.
Federal Ministries	
Cabinet Secretariat	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Work on the national health emergency preparedness and response network. 3) Prepare a disaster management operation plan and emergency preparedness plan on education and health sectors for federal territory. 4) Develop a curriculum for schools, colleges and universities on disaster risk management at the federal level. 5) Prepare guidelines on child protection, special care, special education and rehabilitation of disabled persons in emergencies and share it with NDMA and other humanitarian Organizations. 6) Integrate DRR in to development planning and community development. 7) Assurance DRR integration at all level of public building construction. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations Centre. 2) Provide relief in any disaster. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. <p>Decide policy on developing cities safe from disasters in relation to own mandate.</p>
Ministry of Climate Change (MoCC)	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare a disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry focusing on all hazards. 2) Focus on all levels of preparedness for all types of hazards. 3) Develop technical capacities of the staff of the Ministry to undertake

	<p>disaster risk assessment and disaster risk reduction activities in the environment sector. Incorporate natural disaster risk assessment in the Environmental Impact Assessment (EIA) guidelines.</p> <ol style="list-style-type: none"> 4) Undertake assessment of the vulnerability of natural resources (forest, lakes, streams, mangroves, coral reefs, protected areas, coastal areas, geographical area) to natural and human induced hazards. 5) Implement programs for conservation and rehabilitation of natural resources in order to reduce risks of natural hazards, e.g., reforestation, mangrove plantation, combating desertification, conservation of special natural resources: e.g., wetlands, lakes, reefs, mangroves, and coastal areas. 6) Allocate resources for implementation of programs to conserve and rehabilitate the natural resource base, particularly in up-stream areas of the Indus River basin. 7) Develop mechanisms for assessment of environmental losses and damage in the aftermath of disasters and their rehabilitation. 8) Measurement for seismic threats keeping in view all possible actions. 9) Prepare policy, legislation, plans, strategies and programs regarding all types of disasters. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations Centre. 2) Secure safety of explosive and toxic substances to avoid secondary disasters. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Implement treatment of debris in disaster affected area. 4) Support formulation of Reconstruction Plan in relation to own mandate. 5) Decide policy on developing cities safe from disasters in relation to own mandate.
<p>Ministry of Communications (Member of NDMC)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Assess vulnerability and retrofit of infrastructure (i.e., roads and bridges). 3) Integrate vulnerability reduction methods in construction of new infrastructures. 4) Implement vulnerability reduction strategies for existing infrastructure, facilities and services. 5) Conduct training and drills for staff and management of the Ministry of Communications for disaster preparedness. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations Centre. 2) Conduct a survey in affected areas and assess requirements of relief and recovery needs and promptly recover if damaged. 3) Secure a transportation network for emergency response. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 2) Decide the fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 3) Decide policy on rehabilitating damaged facilities in relation to own mandate.

	<p>4) Support formulation of Reconstruction Plan in relation to own mandate. 5) Decide policy on developing cities safe from disasters in relation to own mandate.</p>
<p>Ministry of Defence (Member of NDMC)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Submit the Ministry's plans to NDMA in order to ensure effective coordination. 3) Allocate resources for preparedness and emergency response activities. 4) Prepare resource inventory including human resources, helicopters, airplanes, vehicles, heavy machinery, etc. and share it with NDMA. 5) Organize drills on disaster preparedness and response. 6) Prepare search and rescue guidelines and share them with NDMA. 7) Enhance DRM capacities of Cantonment Boards specially fire fighting, casualty, evacuation, and search and rescue. 8) Prepare training modules on search and rescue, evacuation, logistics and facilitate training for civilians at federal, provincial and district levels with the collaboration of NDMA, F/G/S/PDMAs, and DDMA as a part of disaster preparedness. 9) Prepare plans for utilizing Armed Forces pensioners, especially those liable to be recalled, for disaster response, featuring reasonable financial compensation. 10) Support civilian authorities in maintaining the traffic and law & order in disaster affected areas. 11) Assess the vulnerability of assets, infrastructure and personnel of the Pakistan Armed Forces to disaster risks and integrate vulnerability reduction measures. 12) Integrate disaster risk management education into the syllabus of National Defence College, Staff College, regimental centres and Armed Forces training institutions. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Deploy Armed Forces for disaster response upon receipt of instructions from the NDMC. 2) Designate a representative in NEOC, P/R/SEOCs and DEOCs (as applicable). 3) Conduct a survey in affected areas and assess requirements of relief and recovery needs. 4) Provide helicopters, aircrafts, ships, etc. for assessment, search and rescue and evacuation in complex emergencies, when required. 5) Support NDMA, F/G/S/PDMAs, DDMA in emergency response; e.g., search and rescue, evacuation, distribution of food, non-food items, tent village, medical camps, debris clearance, transportation of injured and dead bodies, etc. 6) Deploy professional teams, e.g., medical doctors (for health services) engineers to restore the communication and infrastructure network, (breach filling) and manpower (to clear roads, lift debris, control traffic on main roads, maintain law and order, help in the camp site management, provision of drinking water supply, etc.). 7) Assist communities in evacuation, and rescue trapped groups and individuals during disasters. 8) Provide essential first aid as required and transport the injured to hospitals. Undertake aerial and field assessment in collaboration with other stakeholders to identify needs of survivors. 9) Maintain close coordination with NDMA, F/G/S/PDMAs during emergency response.

	<p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Assist civilian authorities in reconstruction and rehabilitation of infrastructure as needed.
<p>Ministry of Finance, Revenue and Planning and Development (Member of NDMC)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Coordinate with NDMA on needs for financial resources to promote disaster risk management programs in hazard-prone areas. 2) Allocate financial resources to NDMA and other line ministries and departments for implementation of disaster risk management activities as part of their development plans. 3) Allocate funds for the establishment of a National Disaster Management Fund, which could be utilized to organize mitigation, emergency relief and to monetize the affected areas. 4) Monitor and evaluate utilization of funds by relevant authorities and ministries on disaster risk management. 5) Encourage financial service sectors and local capital markets to develop schemes for financing disaster risk reduction measures by families and CBOs. 6) Incorporate provisions in micro-finance schemes to have flexible repayment schedules for recipients who have been affected by a disaster. 7) Base planning upon hazard risk maps available with the NDMA and other technical agencies; e.g., PMD, FFC, WAPDA, SUPARCO and circulate these to all development ministries and departments. 8) Develop guidelines on incorporation of disaster risk assessment (and vulnerability analysis) in project identification, design and planning. 9) Organize orientations for line ministries on the guidelines for risk assessment. 10) Issue policy directives to all line ministries about incorporating disaster risk assessment (and vulnerability analysis) in project design and planning. 11) Make the inclusion of vulnerability reduction measures mandatory in implementation of development projects, if located in hazard-prone areas. 12) Monitor the progress on implementation of vulnerability reduction measures in all development projects in hazard-prone areas. 13) Obtain and maintain data on public sector infrastructure in hazard-prone areas in order to plan vulnerability reduction initiatives and organize reconstruction operations. 14) Assist the NDMA in evaluation of losses and damage. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations Centre. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Allocate necessary budget for rehabilitation and reconstruction. 2) Support formulation of a Reconstruction Plan in relation to own mandate. 3) Support policy making for developing cities safe from disasters in relation to own mandate. 4) Support policy making for livelihood restoration of disaster victims. 5) Support policy making for reconstruction of small and medium-sized enterprises and economic recovery.
<p>Ministry of Foreign Affairs (Member of NDMC)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Develop guidelines and procedures to receive relief goods from foreign

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	<p>countries in case of major disaster and share them with NDMA.</p> <ol style="list-style-type: none"> 3) Develop procedures to facilitate arrival of foreign relief humanitarian workers to support disaster response initiatives and to expedite visa renewals, if required. 4) Prepare inventory of embassies/other aid giving Organizations focal points in order to quickly organize requests for assistance. 5) Coordinate with international technical Organizations and relevant UN agencies to receive technical and financial assistance for disaster risk reduction and preparedness. 6) Maintain liaison with NDMA in order to ensure collaborative efforts for disaster preparedness. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC, if and when required. 2) Work as the focal point for the deployment of aid workers in the region, in case of major disaster, and coordinate support given by the Government of Pakistan. 3) Facilitate issuance of visas to foreign humanitarian relief workers so that they can promptly access the affected areas. 4) Coordinate with foreign countries to obtain aid in case of major disaster. 5) Coordinate with NDMA on the issue of foreign humanitarian aid. 6) Coordinate with international technical Organizations and relevant UN agencies to receive technical and financial assistance for disaster risk reduction and preparedness. 7) Coordinate the deployment of aid given by the Government of Pakistan to any other countries, in case of a disaster.
<p>Ministry of Housing and Works</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Develop guidelines and minimum standards on building codes for safer construction of houses, public and private buildings in hazard prone areas. 3) Allocate resources for preparedness and response activities. 4) Ensure compliance with local building laws and the required prescribed standards under national and provincial building codes. 5) Develop guidelines and training courses for builders/contractors for safer construction. 6) Prepare inventory with specifications and locations of heavy construction equipment at federal level. Review it on six-month basis and share with NDMA. 7) Develop sample designs of houses, high-rise buildings and infrastructure (bridges, roads) for safer construction in hazard-prone rural and urban areas. 8) Promote samples of safer designs through media and other channels in order to enhance mass level awareness and application. 9) Promote compliance and enforcement of local building laws requiring prescribed standards under national building codes in hazard-prone urban areas. 10) Conduct training of builders, contractors and masons on safer construction methods. 11) Allocate funds to promote safer construction practices. 12) Implement pilot programs on safer construction in hazard-prone areas to enhance awareness. 13) Monitor construction of government buildings and infrastructure in hazard prone areas to ensure that safer construction techniques are followed.

	<p>14) Develop guidelines on conduct of damage and loss assessment to infrastructure and housing sectors in the wake of a disaster, and conduct assessments after disasters.</p> <p>15) Incorporate disaster risk assessment in the planning process for construction of new roads and bridges.</p> <p>16) Promote use of hazard risk information in land-use planning and zoning programs.</p> <p><u>Emergency Response Phase</u></p> <p>1) Organize emergency repairs for restoration of public transport routes.</p> <p>2) Designate a representative to the National EOC.</p> <p>3) Carry out a detailed technical assessment of damaged public infrastructure.</p> <p>4) Support provincial governments in conducting damage and loss assessment on infrastructure and housing.</p> <p>5) Coordinate with FWO/Armed Forces to get their help in clearing landslides, removing roadblocks and restoration of infrastructure, e.g., bridges.</p> <p>6) Assist in provision of heavy machinery to the district department and district administration for clearing roads, debris, etc.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate.</p> <p>2) Decide policy on rehabilitating damaged facilities in relation to own mandate.</p> <p>3) Support formulation of Reconstruction Plan in relation to own mandate.</p> <p>4) Support policy making for developing cities safe from disasters in relation to own mandate.</p> <p>5) Support policy making for livelihood restoration of disaster victims.</p>
<p>Ministry of Industries</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry.</p> <p>2) Develop guidelines for the industrial sector to ensure safety of industry and its production processes in hazard-prone areas.</p> <p>3) Establish systems to monitor implementation of guidelines by industrial sector.</p> <p>4) Develop system of incentives and disincentives for industry to promote application of disaster safety measures.</p> <p>5) Implement awareness-raising programs for the industrial sector including Chambers of Commerce and Industry (CCI) on integrating disaster risk assessment and vulnerability reduction in project planning and implementation stages.</p> <p>6) Prepare inventories of industries based upon the type of chemicals and raw materials used in their products and the dangers posed by various types of industries.</p> <p>7) Initiate demonstration programs on industrial disaster preparedness.</p> <p>8) Develop safety codes for all industries to reduce risks of industrial and chemical hazards and to ensure vulnerability reduction from natural hazards.</p> <p>9) Develop SOPs for emergency response to industrial disasters.</p> <p>10) Develop physical capability to manage all types of likely industrial disasters including chemical disasters.</p> <p>11) Monitor and encourage implementation of safety codes in industry.</p> <p><u>Emergency Response Phase</u></p> <p>1) Designate a representative to the National EOC.</p> <p>2) Gather information on damage to industrial and production sectors.</p>

*Appendix-II Roles & Responsibilities
(Geological Hazards and Meteorological Hazards)*

	<p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Implement treatment of debris in disaster affected area. 4) Support formulation of Reconstruction Plan in relation to own mandate. 5) Support policy making for developing cities safe from disasters in relation to own mandate. 6) Support policy making for livelihood restoration of disaster victims. 7) Support policy making for reconstruction of small and medium-sized enterprises and economic recovery.
<p>Ministry of Information and Broadcasting</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Formulate communication strategy and guidelines for public and private broadcasters in relation to reporting on emergency response. 3) Ensure that public and private broadcasters broadcast responsible factually correct information in electronic and print media. 4) Take proper and adequate steps for the protection of own installations and property. 5) Prepare an inventory of public and private radio/TV stations, local TV cable operators and national daily newspapers including their detailed addresses. 6) Organize training programs on reporting on emergency response for media journalists and relevant government departments. 7) Coordinate with the NDMA to receive information on the disaster risks and preparedness strategies, particularly regarding community preparedness. 8) Train the staff of Communications Ministry and the private sector media personnel through electronic and print media to raise their awareness about disaster risks and the role of media in promoting community preparedness. 9) Implement programs on awareness-raising of vulnerable communities in high-risk areas of the country. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Ensure that the news items relating to the disaster reflect an accurate picture and do not create undue panic. 2) Take steps for due projection of news directives relating to the situation issued by the federal government agencies concerned with response, including NDMA. 3) Disseminate information about the short/long-term measures initiated by different ministries and departments for relief and rehabilitation of affected people. 4) Curtail normal programs to broadcast essential information on the disaster if requested by the Chairman of NMDA. 5) Arrange comprehensive media rebuttal in events of any distorted news projections by segment of local/foreign media, in concert with NDMA.
<p>Ministry of Information Technology</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Ensure safety of telecommunication infrastructure in hazard-prone areas. 3) Develop alternative technologies to facilitate telecommunication during disaster in affected areas, in case of the collapse of mainstream

	<p>communication systems.</p> <ol style="list-style-type: none"> 4) Allocate resource for preparedness and emergency response. 5) Prepare plan to provide IT support to NDMA, F/G/S/PDMAs and DDMA's in disaster situations and share it with NDMA, F/G/S/PDMAs and DDMA's. 6) Coordinate with NDMA and the National Emergency Operations Centre (NEOC) to ensure the provision of IT support during disaster. 7) Train a team of technical people within the ministry to provide IT support in disaster situations. 8) Ensure that private telecommunication service providers develop SOPs to engage in disaster situations and share those SOPs with NDMA and F/G/S/PDMAs. 9) Develop guidelines for private sector telecommunication for preparing of contingency plans for disaster situations. 10) Organize orientation training for IT staff on emergency response. 11) Maintain through the National Telecommunication Corporation (NTC) a pool of telecom equipment preferably satellite/wireless based for provision and establishment of emergency telecom network. 12) Work with NDMA to have a robust communication infrastructure for efficient use in disaster times. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC. 2) Ensure that IT and telecommunication system functions well during disaster times for effective emergency response. 3) Engage private sector IT firms to provide support during disaster. 4) Deploy technical staff to support EOCs and F/G/S/PDMAs in disaster situations. 5) Monitor the situation and ensure that communication and IT systems function smoothly to carry out emergency response. 6) Document the lessons learnt from the response experiences and incorporate the lessons in future planning. 7) Liaise and coordinate with international bodies and NGOs for resource arrangement on an urgent basis during relief operations and disaster mitigation. 8) Focalize the Ministry on telecom resource management during disaster relief operations. 9) Develop trained manpower working in subordinate Organizations like NTC and SCO who could be called in emergencies for restoration purposes. 10) Liaise and coordinate with member administrations of the International Telecommunication Union (ITU) and the Tampere Convention for arrangement of assistance in the procurement of telecom equipment and human resources for restoration of telecom services during and after disasters. 11) Ensure that ITU based standards and practices are implemented by the operators. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of the Reconstruction Plan in relation to own mandate. 4) Support policy making for developing cities safe from disasters in relation to own mandate.
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<p>Ministry of Interior (Member of NDMC)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Prepare guidelines on evacuation for different disaster situations. 3) Develop security management guidelines for International Humanitarian Organizations, UN missions and diplomats, etc. 4) Prepare a security management plan for international humanitarian Organizations, donor communities, and UN and embassy missions to visit the affected areas. 5) Organize drills for the police/security forces for search and rescue, evacuation and emergency response. 6) Ensure safety of the most vulnerable survivors, e.g., children, elderly, and women by saving them from criminal elements that might want to take advantage of the chaotic situation. 7) Train the police personnel in emergency response skills, e.g., rescue, medical first aid, fire fighting, evacuation and warning. 8) Enhance capacities of the National Crisis Management Cell to deal with crisis situations created by terrorist and criminal activities in accordance with the mandate of the NCMC. 9) Share the plans of the NCMC with NDMA for better coordination and effective response. 10) Revamp the federal and provincial Civil Defence Departments. This may involve strengthening the legal mandate of federal Civil Defence to include actual response as its responsibility, directing provincial Civil Defence offices to report to the federal Civil Defence, upgrading of the Civil Defence Training Academies, provision of appropriate equipment to Civil Defence offices to enable them to perform its functions related to search and rescue, fire fighting, bomb disposal, etc. 11) In coordination with provincial and municipal governments, arrange appropriate equipment, training and supplies for the personnel of fire services in all provincial headquarters and other major cities and towns. 12) Coordinate with NDMA regarding the development and implementation of strategies for revamping of the Civil Defence Department and Fire Services. 13) Take actions in coordination with provincial and municipal governments for revamping of the fire services in major cities and towns, in order to enable them to deal with fire incidents. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Carry out search and rescue with the help of Armed Forces. 2) Support district administration in evacuation of affected people and transport them to the camp sites. 3) Protect life and property. 4) Maintain law and order situation in relief centres and shelter sites. 5) Provide security in relief centres, shelter sites and warehouses set up by the government in disaster-affected areas. 6) Arrange security for government property and installations damaged in the disaster. 7) Provide assistance to District, Provincial and National Disaster Management Authorities in disaster warning, rescue, relief and evacuation operations. 8) Maintain peace and security in affected areas. 9) Ensure safety of relief goods being sent to affected areas from other parts of the country. 10) Provide security to the foreign dignitaries, donors, UN agencies, volunteers, government officials, and staff of international NGOs and humanitarian Organizations visiting and engaged in relief operations.
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	<ol style="list-style-type: none"> 11) Keep close watch for any criminal and anti state activity in the affected area. 12) Manage traffic during disaster situation in the affected area. 13) Operate through Police Telecommunication, the wireless and tele-printer network, for disaster information and messages to all concerned departments and agencies.
Ministry of Law, Justice and Parliamentary Affairs	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Develop appropriate laws and regulations to ensure the provision of relief and recovery packages to disaster survivors. 2) Monitor the situation of human rights in affected areas and taking action on human rights violations of disaster survivors, e.g., denial of aid, capturing of property, kidnapping of children or women, and harm to elderly. 3) Work with relevant UN agencies, e.g., Inter-Agency Standing Committee (IASC) and the IOM to ensure the human rights of affected people. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC.
Ministry of Human Rights	<p><u>Pre Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Implement a Program to raise awareness of the staff of the Ministry on human rights and disasters. 2) Implement laws, policies and measures regarding disasters. 3) Coordinate activities of ministries, divisions and provincial governments in respect to the disaster. 4) Prepare reports on potential bottlenecks that may hinder certain vulnerable groups of disaster survivors from receiving relief and rehabilitation packages. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Refer and recommend investigations in respect of any incident of violation of human rights. 2) Care for populations of vulnerable groups.
Ministry of Economic Affairs and Statistics	<p><u>Pre Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Negotiate for and agree on foreign counties regarding financial aid to implement mitigation projects for disaster risk reduction. 2) Liaison with UN agencies and donors for DRR initiatives. 3) Deal and agree with international Organizations in the field of DRR. 4) Maintain data on different topics and their utilization for the preparation DRM plan. 5) Assess necessary resources for disaster preparedness. 6) Provide technical support in terms of skill enhancement, etc. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Coordinate with other ministries and departments related to DRM. 2) Collect data regarding losses and damage. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Assist other ministries and departments in reconstruction and rehabilitation planning.
Ministry of Regulation and Services	<p><u>Pre Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Promote DRR education. 3) Provide special care for health emergencies. 4) Prepare for any response in case of emergency. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC and at provincial level.

	<p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction.
<p>Ministry of Food Security and Research</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Allocate resources for preparedness and response activities. 3) Allocate funds in annual budget for implementation of disaster risk management activities in hazard prone areas. 4) Prepare an emergency preparedness plan in food and livestock sectors. 5) Undertake vulnerability and risk analysis for food and livestock sectors in hazard-prone areas, particularly in relation to floods, droughts, cyclones and locusts. 6) Develop an agriculture and livestock assessment checklist. 7) Develop indicators for the drought early warning system. 8) Collaborate with WFP to identify food insecure areas of disaster prone districts in Pakistan. 9) Establish enough livestock feed manufacturing units in disaster prone districts so that people can access livestock feed in disaster times. 10) Create awareness on livestock feed and promote it through agriculture extension workers and livestock field assistants in disaster prone districts. 11) Create awareness on livestock feed among livestock owners and promote production of livestock feed. 12) Ensure that all provinces maintain reserve quota for essential vaccines in the disaster prone districts to deal with any disease outbreak in animals. 13) Develop guidelines and minimum standards for cattle camps. 14) Prepare an inventory of equipment, vehicles, agricultural input and animal vaccine and medicine suppliers. Update inventory on a six-month basis and share it with NDMA. 15) Coordinate with NDMA and jointly identify appropriate actions for reducing vulnerability of food and livestock to disaster risks. 16) Coordinate with PMD, FFC and research institutions to establish warning systems for identification of risks to food and livestock sectors. 17) Develop capacity and raise awareness of staff of ministries at federal and provincial levels, local extension workers and farmers on disaster preparedness for food, agriculture and livestock sectors. 18) Promote contingency crop planning to deal with year-to-year climate variations and crop diversification including use of hazard resistant crops, to deal with shifts in climate patterns. 19) Ensure sustainable livelihoods in areas of recurrent climate risks (i.e., arid and semi-arid zones, flood and drought prone areas) by promoting supplementary income generation from off-farm (e.g., animal husbandry) and non-farm activities. 20) Promote effective insurance and credit schemes to compensate for crop damage and losses to livelihoods due to natural hazards. 21) Assist in saving crops, agricultural land and livestock in disaster situations. 22) Make available inputs like seed plants, fertilizers and agricultural equipment to victims of disasters on credit basis. 23) Survey and investigate extent of damage to crops and livestock. 24) Ensure adequate availability of food stocks in disaster situations. 25) Organize ration depots at locations required by the local authorities. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations

	<p>Centre.</p> <ol style="list-style-type: none"> 2) Conduct an initial rapid assessment to assess the damage to crops and livestock. 3) Be vigilant about pest attack on crops and take effective measures. 4) Provide technical advice to the farming community to protect standing crops during heavy rain, wind storm, flood and cyclone situations. 5) Support provincial livestock departments in the provision of fodder, de-worming medicines and vaccines for the animals during the drought period. 6) Coordinate with the Federal Flood Commission and NDMA in relation to emergency response. 7) Develop a plan for the agriculture sector for early recovery phase if needed. 8) Prepare a detailed report and disseminate it to all stakeholders. Document the lessons learnt from the response experiences and incorporate the lessons in future planning.
<p>Ministry of Petroleum and Natural Resources</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Develop guidelines for safety in oil/gas, fire and mining sectors. 3) Integrate risk assessment and risk reduction in planning and implementation of projects in the above sectors. 4) Implement awareness-raising programs for staff in the oil, gas, fire and mining sectors. 5) Develop SOPs for emergency response to disasters in the above sectors. 6) With assistance from the Geological Survey of Pakistan (GSP) conduct research on hazard mapping and produce user-friendly maps. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC. 2) Secure stock of fuel for emergency response activities and disseminate as needed. 3) Monitor the situation of facilities and update NDMA on a regular basis. 4) Secure safety of explosive and toxic substances to avoid secondary disasters. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of Reconstruction Plan in relation to own mandate. 4) Support policy making for developing cities safe from disasters in relation to own mandate.
<p>Ministry of Ports and Shipping</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Assess vulnerability of port facilities, infrastructure and services. 3) Integrate vulnerability reduction methods in construction of new infrastructure at ports. 4) Implement vulnerability reduction strategies for existing infrastructure, facilities and services. 5) Conduct training and drills for staff and management of the Ministry and ports and shipping industry on disaster preparedness. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations

	<p>Centre.</p> <ol style="list-style-type: none"> 2) Transport and receive relief material by sea transportation. 3) Monitor the situation of ports and update NDMA on a regular basis. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of Reconstruction Plan in relation to own mandate. 4) Support policy making for developing cities safe from disasters in relation to own mandate.
<p>Ministry of Railways</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Prepare a duty roster for railway staff in emergency situation and organize training for them. 3) Prepare an inventory of railway warehouses including size and storage capacity and railway stations at the district level with basic facilities such as wat/san and share it with NDMA. Revise inventory every six months and share it with NDMA. 4) Develop a contingency plan to deal with degradation of railway moveable/static assets due to natural/industrial disasters and take preventative measures for it. 5) Develop IEC material for travelers in case of disaster and install fire extinguishers in the railway bogies to deal with fire incidents. 6) Train railway staff in fire fighting, bomb disposal and search and rescue skills. 7) Stock stores including emergency bridging equipment at selected nodal points to enable early restoration of service in case of failure of bridges due to disasters. 8) Identify vulnerabilities of train infrastructure to natural disasters in hazard-prone areas. 9) Develop strategies to reduce vulnerabilities of the train network and infrastructure to natural disasters. 10) Implement actions for vulnerability reduction of the train network in Pakistan, so that the damage and losses to the train network will be lower in case of disaster. 11) Prepare strategies and acquire capabilities for quick rehabilitation of the train network and services in case of disaster impacts. 12) Identify alternative strategies for continuity of services of Pakistan railway in case of a severe disaster impacts on the train network. 13) Develop guidelines and procedures to receive and transport relief goods to disaster-affected areas in a quick manner. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations Centre. 2) Transport relief materials to the disaster affected areas. 3) Monitor the situation of railway tracks and update NDMA on a regular basis. 4) Coordinate transportation of relief goods with the NDMA and relevant local authorities. 5) Allocate trains for on-time and safe transportation of relief goods to affected areas. Develop technical capacities of the Ministry staff to undertake risk assessments and risk reduction in railway networks in relation to natural and human-induced disasters.

	<p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of Reconstruction Plan in relation to own mandate. 4) Support policy making for developing cities safe from disasters in relation to own mandate.
<p>Ministry of Science and Technology</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate of the Ministry. 2) Assess vulnerability of infrastructure and facilities of the Ministry in hazard-prone areas. 3) Implement strategies to reduce vulnerabilities of infrastructure and facilities to disasters. 4) Develop awareness of the staff of the Ministry on the role of science and technology in disaster risk management. 5) Undertake research to explore the role of the Ministry in promoting disaster risk management. 6) Develop technologies for better disaster preparedness and disaster response, e.g., emergency communications technologies in case of damage to the mainstream communication infrastructure. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative in National EOC if needed.
<p>Ministry of Water and Power</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan including the worst scenarios of structural failure with regards to the mandate of the Ministry. 2) Inform NDMA, F/G/S/PDMAs on water flow levels of dams in monsoon season. 3) Carry out periodic monitoring and inspection of dams and take measures for repair, if needed through WAPDA (DSO). 4) Monitor and manage the dams and reservoirs for irrigation releases from the point of view of specific hazards peculiar to that area. 5) Assess disaster vulnerability of existing dams, reservoirs and power sector infrastructure in hazard-prone areas. 6) Implement strategies to reduce vulnerability of existing dams, reservoirs and power sector infrastructure against disasters. 7) Incorporate disaster vulnerability assessment in design and planning of future projects on water and power sector infrastructure development. 8) Include vulnerability reduction measures in the construction of water and power sector infrastructure in hazard-prone areas. 9) Provide telemetric data from rain gauge stations and flood data from the Indus River basin to the Flood Forecasting Division of the Pakistan Meteorological Department through WAPDA. 10) Coordinate with the relevant ministry/authority in India in relation to releasing water in eastern rivers (Chenab, Ravi, Sutlej, Beas) in the monsoon period through PCIW and in accordance with relevant provisions of the 1960 Indus Waters Treaty. 11) Monitor the situation on water releases from India and update the Prime Minister/Minister for Water and Power. Exchange water data with the Indian Government (ICIW), as part of the Indus Water Treaty, through PCIW. 12) Conduct studies on possibilities of dam failures and develop

*Appendix-II Roles & Responsibilities
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	<p>contingency plans through WAPDA (DSO).</p> <ol style="list-style-type: none"> 13) Give necessary advice to WAPDA to monitor and manage the dams and reservoirs for irrigation releases from the point of view of specific hazards peculiar to that area. 14) Give necessary advice to WAPDA to assess disaster vulnerability of existing dams, reservoirs and power sector infrastructure in hazard-prone areas. 15) Give necessary advice to WAPDA to implement strategies to reduce vulnerability of existing dams, reservoirs and power sector infrastructure against disasters. 16) Give necessary advice to WAPDA to incorporate disaster vulnerability assessment in design and planning of future projects on water and power sector infrastructure development. 17) Give necessary advice to WAPDA to include vulnerability reduction measures in the construction of water and power sector infrastructure in hazard-prone areas. 18) Give necessary advice to WAPDA to conduct studies on possibilities of dam failures and develop contingency plans. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations Centre. 2) Keep updating the river water flow situation to NDMA and provinces. 3) Monitor the situation of dams and power supply facilities through WAPDA and update NDMA on a regular basis. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of Reconstruction Plan in relation to own mandate. 4) Support policy making for developing cities safe from disasters in relation to own mandate.
Federal Departments and Authorities	
Capital Development Authority	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Allocate resources for preparedness and emergency response activities. 3) Prepare an inventory of fire fighting vehicles, cranes, dumpers, loaders, shovels, excavators, road cutters, etc. and share it with NDMA. 4) Organize training for the staff on disaster risk management. 5) Coordinate with NDMA. 6) Promote measures to develop urban structure resistant to earthquake disaster in Islamabad. 7) Develop an operation continuity plan to be prepared for possible disruption and damage from disasters. 8) Integrate the disaster risk reduction to the development plan and program. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Carry out a detailed technical assessment of damaged public infrastructure. 2) Designate a representative to the EOC for CDA as needed. 3) Coordinate with FWO/Armed Forces to get their help in clearing landslides, removing roadblocks and restoration of infrastructure, e.g., bridges. 4) Provide fire fighting vehicles, cranes, dumpers, loaders, shovels,

	<p>excavators, road cutters, etc.</p> <p>5) Coordinate with NDMA/F/G/S/PDMAs.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate.</p> <p>2) Decide policy on rehabilitating damaged facilities in relation to own mandate.</p> <p>3) Support formulation of Reconstruction Plan in relation to own mandate.</p> <p>4) Support policy making for developing cities safe from disasters in relation to own mandate.</p>
<p>Civil Aviation Authority</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate.</p> <p>2) Allocate resources for preparedness and emergency response activities.</p> <p>3) Compile an inventory of airports and share it with NDMA.</p> <p>4) Devise a security plan for airports in Pakistan.</p> <p>5) Ensure that the fire systems in all airports are installed according to the international standards.</p> <p>6) Check and test fire systems in airports regularly and make sure that they are in working order.</p> <p>7) Organize training for staff on emergency management, first aid, etc.</p> <p>8) Prepare IEC material on disaster related issues on airports, e.g., bomb threat, fire, and attacks on airport for passengers.</p> <p>9) Formulate an inventory of resources e.g., equipment, vehicles, firefighting equipment, etc.</p> <p><u>Emergency Response Phase</u></p> <p>1) Designate a representative to the National EOC and P/R/SEOCs, if needed.</p> <p>2) Keep airport staff alert.</p> <p>3) Designate a representative to contact in disaster times.</p> <p>4) Facilitate humanitarian Organizations and UN air charters in landing and take off for relief activities.</p> <p>5) Provide space for storage relief goods during disaster time.</p> <p>6) Conduct a survey in affected airports and assess requirements of relief and recovery needs.</p> <p>7) Support the Ministry of Defence in emergency response, e.g., search and rescue, evacuation, distribution of food and non-food items, tent village, medical camps, transportation of injured and dead bodies, etc.</p> <p>8) Maintain close coordination with the Ministry of Defence during emergency response.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate.</p> <p>2) Decide policy on rehabilitating damaged facilities in relation to own mandate.</p> <p>3) Support formulation of Reconstruction Plan in relation to own mandate.</p> <p>4) Support policy making for developing cities safe from disasters in relation to own mandate.</p>
<p>Civil Defence</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate.</p> <p>2) Allocate resources for preparedness and emergency response activities.</p> <p>3) Develop training modules and organize training on fire prevention/fighting, rescue, casualty handling, bomb reconnaissance/disposal for government departments and youth in</p>

	<p>colleges and universities.</p> <ol style="list-style-type: none"> 4) Organize/conduct refresher courses and simulation exercises for volunteers in above-mentioned areas. 5) Compile a database of volunteers at district headquarters, tehsil and UC levels and organize training on rescue and first aid. 6) Draw up a list of trained government officials in different types of training as mentioned above and share it with NDMA. 7) Organize training on fire fighting for government staff and volunteers at and below district level. 8) Create community awareness on public safety. 9) Prepare an inventory of equipment, Civil Defence offices, human resources and volunteers in each office and share this with NDMA and F/G/S/PDMAS in each district. 10) Recruit/induct operational staff for SAR teams with required specialized skills. 11) Enhance capabilities of the existing search and rescue teams of Pakistan. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the NEOC/P/R/SEOCs/DEOCs (as applicable). 2) Assist NDMA, F/G/S/PDMAs, DDMA in search and rescue and evacuation in different kinds of disasters. 3) Divide potential affected sites into various zones. Each zone is to be controlled by designated appointment in case of major disaster. Alternatives are to be nominated by therein. 4) Assist local administration/Armed Forces in rescue, evacuation and relief measures. 5) Supplement the disaster-response equipment of the Armed Forces. 6) Save lives by rapid extrication of persons trapped beneath debris or in buildings damaged by a natural or man-made disaster. 7) Provide first aid to injured persons and transport them to the nearest hospital. 8) Assist fire brigade staff in search and rescue and first aid operations related to fire and other incidents. 9) Assist the health department in treatment of injured victims, loading dead bodies into ambulances and disposal of dead bodies. 10) Organize vehicle parking arrangements with help of traffic police at the district level. 11) Assist DEOCs and the police department in setting up an information system for members of the public, whose relatives, friends or family members are lost or missing. 12) Ensure evacuation of damaged buildings/structures including demolition of damaged structures to avoid further loss of life and properties. 13) Provide quick and effective search and rescue coverage, protection and operation in case of any disaster. 14) Build public confidence through introduction of more effective measures for their protection and ensure adoption of requisite preventive measures by the community. 15) Assist in restoration of essential traffic so rescue work can be carried out without any hindrance or obstruction. 16) Assist in debris clearance and restoration of essential services to the affected buildings. 17) Search and defuse unexploded bombs in the affected areas. 18) Coordinate airlifting of relief goods from abroad with the PIA.
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<p>Coast Guards</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Develop a contingency plan especially for the coastal areas of Pakistan. 3) Jointly organize training programs with DDMA's for the coastal communities on first aid, evacuation, etc. 4) Prepare an inventory of equipment and buildings and share it with NDMA, F/G/S/PDMA's and DDMA's. 5) Disseminate warnings to the coastal communities for potential disasters. 6) Coordinate with the Maritime Security Agency (MSA) and Pakistan Navy about any ocean related natural and man-made hazards. 7) Develop capacities in emergency response, e.g., evacuations, rescue, first aid, etc. 8) Keep liaison with the District, Provincial and National DM Authorities and PMD. 9) Identify safer areas/buildings to be used as evacuation shelters, when needed. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative in NEOC/P/R/SEOCs/DEOCs particularly in the cyclone season and monsoon period. 2) Assist DDMA's in relief operations. 3) Assist DDMA in assessment of damage and losses of the coastal public property and prepare a report and share it with DDMA's, F/G/S/PDMA's, and NDMA. 4) Assist DDMA's, F/G/S/PDMA's and NDMA to evacuate communities from the coastal areas in case of cyclone or another sea related hazards. 5) Coordinate and closely work with NDMA's, F/G/S/PDMA's, and DDMA in case of any coastal area disaster. 6) Warn coastal communities through public address systems and face-to-face contacts. Assist most vulnerable families in evacuation to safer sites. 7) Conduct search and rescue to assist the trapped individuals, families and communities. 8) Coordinate with the Maritime Security Agency (MSA) on any ocean related hazards.
<p>Federal Flood Commission (FFC) (FFC is responsible mainly for meteorological disasters)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Make flood protection policies and plans for the country. 3) Review flood protection works and plans to be prepared plans by each provincial government (Irrigation and Power Department) for restoration and reconstruction work. 4) Update NDMA and Armed Forces on protection bund situation particularly in flood season. 5) Monitor provincial governments' implementation of the flood management projects. 6) Review and approve flood protection schemes prepared by provincial governments and concerned federal agencies. 7) Make recommendations regarding regulation of reservoirs for flood control. 8) Review damage to flood protection works and review plans for restoration and reconstruction works. 9) Confirm and concur measures to improve the flood forecasting and warning system.

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	<p>10) Prepare a research Program for flood control and protection. Standardize designs and specifications for flood protection works.</p> <p>11) Evaluate and monitor progress of the National Flood Protection Plan implementation.</p> <p><u>Emergency Response Phase</u></p> <p>1) Designate a representative to the National EOC.</p> <p>2) Update NEOC on river water flow in flood situations on a daily basis.</p> <p>3) Coordinate with provincial irrigation departments and get updates.</p> <p>4) Prepare updates on flood protection bunds and the canal system and share them with NDMA, F/G/S/PDMAs.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate.</p> <p>2) Decide policy on rehabilitating damaged facilities in relation to own mandate.</p> <p>3) Support formulation of Reconstruction Plan in relation to own mandate.</p> <p>4) Support policy making for developing cities safe from disasters in relation to own mandate.</p>
<p>Fire Services</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate.</p> <p>2) Prepare a contingency plan with different scenarios for residential areas in urban and slum areas in big cities.</p> <p>3) Prepare a contingency plan for industrial areas with particular focus on the chemical industry.</p> <p>4) Purchase fire-fighting equipment and establish fire stations according to size and population of the each city in Pakistan.</p> <p>5) Develop IEC material in national/local languages on preventive measures for fire.</p> <p>6) Organize awareness programs on fire for schoolteachers, students, workers in formal/informal industrial sector, gas stations, commercial markets, etc.</p> <p>7) Identify fire prone locations in the city and prepare contingency plans accordingly.</p> <p>8) Develop a fire risk monitoring system in urban localities.</p> <p>9) Conduct fire-fighting drills on a regular basis.</p> <p>10) Keep all fire brigade vehicles in order and ready to deploy at any time anywhere.</p> <p>11) Raise awareness of citizens and stakeholders, e.g., hotel, restaurant, shop owners, petrol pump owners, about potential fire risks and strategies for combating fire.</p> <p>12) Develop technical skills of volunteers on fire fighting.</p> <p>13) Deploy fire-fighting teams.</p> <p><u>Emergency Response Phase</u></p> <p>1) Deploy fire-fighting teams.</p> <p>2) Rescue people.</p> <p>3) Coordinate with NDMA/F/G/S/PDMAs/DDMAs.</p>
<p>Geological Survey of Pakistan</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare geological maps and information on natural disasters in the country and share them with NDMA.</p> <p>2) Provide geological maps and information for hazard risk zones for planning and response.</p> <p>3) Coordinate and facilitate with NDMA, F/G/S/PDMAs on a regular basis in provision of geological information for emergency preparedness and planning purposes.</p>

	<p><u>Emergency Response Phase</u></p> <p>1) Prepare and provide geological information and maps to relevant Organizations and affected areas after the disaster.</p>
<p>Indus River System Authority (IRSA) (IRSA is responsible mainly for meteorological disasters)</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Introduce Mainstreaming DRR into Development Plan. 2) Manage appropriate Indus water use to avert water-related disasters.</p> <p><u>Emergency Response Phase</u></p> <p>1) Update NEOC on river water flow in flood situations on a daily basis to collaborate with FFC, PMD, PCIW and Provincial Irrigation Department. 2) Coordinate with FFC, PMD and PCIW and get updates on information and coordination activities related to water disasters.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Support formulation of Reconstruction Plan in relation to own mandate. 2) Support policy making for developing the country safe from disasters in relation to own mandate.</p>
<p>National Database and Registration Authority (NADRA)</p>	<p><u>Emergency Response Phase</u></p> <p>1) Provide WATAN cards to the affected people after the disaster.</p>
<p>National Crisis Management Cell (NCMC)</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Manage a 24-hour operational Control Room. 3) Collect information on emergencies of all kinds in the country. 4) Coordinate with Provincial Crisis Management Cells (PCMCs). 5) Coordinate with other agencies to gather relevant information, e.g., casualty figures, etc. 6) Coordinate plans for emergency response in case of crisis situations.</p> <p><u>Emergency Response Phase</u></p> <p>1) Designate a representative to the National EOC.</p>
<p>National Emergency Relief Cell (NERC)</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Stock tents, medicines, blankets, clothing plastic sheets and tarpaulins. Share this information with NDMA on a fortnightly basis. 3) Prepare an inventory of emergency relief item suppliers and share it with NDMA. 4) Prepare a list of relief items suppliers those who can supply relief goods on short notice. Share it with NDMA. 5) Develop guidelines and mechanisms of release of relief goods from warehouse. 6) Maintain records of receiving and dispatching relief goods from/to foreign and local agencies in the event of disaster. 7) Prepare procurement plans of relief stores in concert with NDMA.</p> <p><u>Emergency Response Phase</u></p> <p>1) Designate a representative to the National EOC. 2) Immediately release relief goods in case of disaster. 3) Coordinate international relief assistance in case of major catastrophe in consultation with NDMA. 4) Closely work and coordinate with NDMA.</p>
<p>National Highway Authority</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Assess the vulnerability of highways to earthquakes and tsunamis. 3) Integrate vulnerability reduction methods in construction of new</p>

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	<p>highways.</p> <ol style="list-style-type: none"> 4) Implement vulnerability reduction strategies for existing infrastructure, facilities and services. 5) Conduct training and drills for staff and management of National Highway Authority about disaster preparedness. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations Centre. 2) Conduct a survey in affected areas and assess requirements of relief and recovery needs and promptly recover if damaged. 3) Secure a transportation network for emergency response. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of Reconstruction Plan in relation to own mandate. 4) Decide policy on developing cities safe from disasters in relation to own mandate.
<p>National Housing Authority</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Assess the vulnerability of houses and buildings to earthquakes and tsunamis. 3) Integrate vulnerability reduction methods in construction of new houses. 4) Implement vulnerability reduction strategies for existing infrastructure, facilities and services. 5) Conduct training and drills for staff and management of National Highway Authority about disaster preparedness. 6) Integrate the concept of DRR to the national housing policy and building codes. 7) Prepare a guideline to reinforce vulnerable houses to earthquakes. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC. 2) Support provincial governments in conducting of damage and loss assessment to housing. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of Reconstruction Plan in relation to own mandate. 4) Support policy making for developing cities safe from disasters in relation to own mandate.
<p>National Logistics Cell (NLC)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Prepare a contingency plan for transportation of relief goods in case of major disaster. 3) Prepare inventory of NLC vehicles and share it with NDMA. 4) Identify and prepare an inventory of private transport companies that can be engaged in a national major disaster. 5) Ensure delivery of an adequate quantity of POL supplies at designated areas in the event of disruption of the POL market supply chain.

	<ol style="list-style-type: none"> 6) Act as coordinator of road, rail, air and sea transport during a disaster for relief supplies. 7) Plan and organize the movement of logistics from base(s) to forward location(s). 8) Liaise, coordinate and plan with all major transport companies/Organizations involved in transportation of goods on behalf of NDMA, to meet any eventuality. 9) Detach a small part of contingent to be embedded with NDMA as required. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC, if needed. 2) Provide vehicles to transport relief goods. 3) Act as coordinator of road transport agencies during disasters. 4) Ensure smooth transportation of relief goods in the affected areas. 5) Support government in technical appraisal of projects/programs pertaining to roads, road transport, railways, ports and shipping. 6) Liaise with private transport agencies on behalf of NDMA if needed.
<p>Pakistan Armed Forces</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Allocate resources for preparedness and emergency response activities. 3) Prepare a resource inventory including human resources, helicopters, airplanes, vehicles, heavy machinery, etc. and share it with NDMA. 4) Organizedrills on disaster preparedness and response. 5) Prepare search and rescue guidelines and share them with NDMA. 6) Enhance DRM capacities of Cantonment Boards, especially fire fighting, casualty, evacuation, and search and rescue. 7) Prepare training modules on search and rescue, evacuation, logistics and facilitate training for civilian at federal, provincial and district levels with the collaboration of NDMA, F/G/S/PDMAs, and DDMA as a part of disaster preparedness. 8) Prepare plans for utilizing Armed Forces pensioners, especially those liable to be recalled, for disaster response, featuring reasonable financial compensation. 9) Support civilian authorities in maintaining the traffic and law & order in disaster affected areas. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative in NEOC, P/R/SEOCs and DEOCs (as applicable). 2) Conduct a survey in affected areas and assess requirements of relief and recovery needs. 3) Provide helicopters, aircrafts, ships, etc. for assessment, search and rescue and evacuation in complex emergencies, when required. 4) Support NDMA, F/G/S/PDMAs, DDMA in emergency response, e.g., search and rescue, evacuation, distribution of food, non-food items, tent village, medical camps, debris clearance, transportation of injured and dead bodies, etc. 5) Deploy professional teams, e.g., medical doctors (for health services) engineers to restore the communication and infrastructure network, (breach filling) and manpower (to clear roads, lift debris, control traffic on main roads, maintain law and order, help in the camp site management, provision of drinking water supply, etc.). 6) Maintain close coordination with NDMA, F/G/S/PDMAs during emergency response.

<p>Pakistan Commissioner for Indus Waters (PCIW) (PCIW is responsible mainly for Meteorological disasters)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Introduce mainstreaming DRR into Development Plan. 2) Coordinate policies and actual management and implementations of the Treaty mainstreaming DRR with other countries concerned with Indus basin. 3) Coordinate on monsoon season flood flow data arrangements with India for eastern rivers flood discharges under the Indus Water Treaty – 1960. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Coordinate information on floodwaters with other countries in case of floods with PMD, Irrigation Department, IRSA, FFC and WAPDA. 2) Coordinate information on releasing water from each dam located in other jurisdiction areas with IRSA. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Support formulation of Reconstruction Plan in relation to own mandate with FFC, WAPDA, PMD and IRSA. 2) Consider the amendments of agreements related to water use between international governments and Organizations based on the Treaty.
<p>Pakistan Housing Authority</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Assess the vulnerability of houses and buildings to earthquakes and tsunamis. 2) Integrate vulnerability reduction methods in construction of new houses. 3) Implement vulnerability reduction strategies for existing infrastructure, facilities and services. 4) Conduct training and drills for staff and management of Pakistan Housing Authority on disaster preparedness. 5) Integrate the concept of DRR to the national housing policy and building codes. 6) Prepare a guideline to reinforce vulnerable houses to earthquakes. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC. 2) Support provincial governments in conducting of damage and loss assessment to housing. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of Reconstruction Plan in relation to own mandate. 4) Support policy making for developing cities safe from disasters in relation to own mandate.
<p>Pakistan Meteorological Department (PMD)</p>	<p><u>Pre-Disaster Phase for Geological Disasters</u></p> <ol style="list-style-type: none"> 1) Develop a communication strategy for disseminating tsunami early warning information so that the information reaches the end user. 2) Develop a people-centred early warning system for tsunamis. 3) Maintain the communication system. 4) Take measures to increase the capacity of the PMD in relation to the tsunami forecast and earthquake related information. 5) Coordinate with GSP, SUPARCO, FFC and other Organizations collecting data that helps to forecast any hazard in the country. <p><u>Pre-Disaster Phase for Meteorological Disasters</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Develop a communication strategy for disseminating early warning

	<p>information so that the information reaches the end user.</p> <ol style="list-style-type: none"> 3) Develop a people-centred early warning system. 4) Prepare a plan for issuing weather forecast data on a regular basis through electronic and print media. 5) Prepare a list of rain gauge data collection stations and other methods of data collection in the country and share it with NDMA, F/G/S/PDMAs, DDMA, WAPDA, and FFC. 6) Maintain the satellite system. 7) Take measures to increase the capacity of the PMD in relation to the tsunami forecast and earthquake related information. 8) Coordinate with GSP, SUPARCO, FFC, FWC and other Organizations collecting data that helps to forecast any hazard in the country. 9) Observe hazards and generate meteorological, geophysical and phonological data. 10) Analyze data for issuing forecasts and warnings for aviation, agriculture, shipping, ports, irrigation, etc. 11) Issue forecasts and warnings for any approaching events that might cause damage and loss to life and property. 12) Scrutinize, compare and publish data for appraisal of long-term weather trends and earthquakes. 13) Analyze extreme events observed in the past and their future trends, e.g., climate change, weather modification, land-ocean-atmosphere interaction, and seasonal weather prediction. <p><u>Emergency Response Phase for Meteorological Disasters</u></p> <ol style="list-style-type: none"> 1) Inform public on the weather forecast and issue warning in case of potential threat. 2) Disseminate flood information to the provincial and district heads by phone and fax on a daily basis during flood season. 3) Share weather forecasts and early warning information with NDMA, F/G/S/PDMAs, and the media on a regular basis in the monsoon period. 4) Coordinate with the Federal Flood Commission, Flood Warning Centre, WAPDA, PCIW, FFD, and SUPARCO in the monsoon period. 5) Collect rain data on a regular basis, consolidate it and share it with NDMA. 6) Disseminate warnings on hazards to relevant users through speedy communication in coordination with NDMA.
<p>Pakistan Public Works Department</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Assess the vulnerability of houses and buildings. 3) Integrate vulnerability reduction methods in construction of new houses and buildings. 4) Implement vulnerability reduction strategies for existing infrastructure, facilities and services. 5) Conduct training and drills for staff and management of Pakistan Public Works Department on disaster preparedness. 6) Prepare a guideline to reinforce vulnerable houses to earthquakes. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National EOC. 2) Carry out detailed technical assessments of damaged public infrastructure. 3) Support provincial governments in conducting damage and loss assessment to infrastructure and housing. 4) Coordinate with FWO/Armed Forces to get their help in clearing landslides, removing roadblocks and restoration of infrastructure, e.g.,

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	<p>bridges.</p> <p>5) Provide heavy machinery to the district department and district administration for clearing roads, debris, etc.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate.</p> <p>2) Decide policy on rehabilitating damaged facilities in relation to own mandate.</p> <p>3) Support formulation of Reconstruction Plan in relation to own mandate.</p> <p>4) Support policy making for developing cities safe from disasters in relation to own mandate.</p>
<p>Pakistan Railways</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate.</p> <p>2) Assess the vulnerability of railway facilities and buildings to earthquakes and tsunamis.</p> <p>3) Integrate vulnerability reduction methods in construction of new railway facilities and buildings.</p> <p>4) Implement vulnerability reduction strategies for existing infrastructure, facilities and services.</p> <p>5) Conduct training and drills for staff and management of Pakistan Railways on disaster preparedness.</p> <p>6) Integrate the concept of DRR to the future plans and programs.</p> <p>7) Prepare a guideline to reinforce vulnerable railway facilities to earthquakes.</p> <p><u>Emergency Response Phase</u></p> <p>1) Designate a representative to the National Emergency Operations Centre.</p> <p>2) Transport relief materials to the disaster affected areas.</p> <p>3) Monitor the situation of railway tracks and update NDMA on a regular basis.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate.</p> <p>2) Decide policy on rehabilitating damaged facilities in relation to own mandate.</p> <p>3) Support formulation of Reconstruction Plan in relation to own mandate.</p> <p>4) Support policy making for developing cities safe from disasters in relation to own mandate.</p>
<p>Planning Commission</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Base planning upon hazard risk maps available with the NDMA and other technical agencies, e.g., PMD, FFC, WAPDA, and SUPARCO and circulate these to all development ministries and departments.</p> <p>2) Organize orientations for line ministries about the guidelines on risk assessment.</p> <p>3) Issue policy directives to all line ministries about incorporating disaster risk assessment (and vulnerability analysis) in project design and planning.</p> <p>4) Make the inclusion of vulnerability reduction measures mandatory in implementation of development projects, if located in hazard-prone areas.</p> <p>5) Monitor the progress on implementation of vulnerability reduction measures in all development projects in hazard-prone areas.</p> <p>6) Obtain and maintain data on public sector infrastructure in hazard-prone areas in order to plan vulnerability reduction initiatives</p>

	<p>and organize reconstruction operations.</p> <p>7) Assist NDMA in evaluation of losses and damage.</p> <p><u>Emergency Response Phase</u></p> <p>1) Designate a representative to the National EOC.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Support formulation of Reconstruction Plan in relation to own mandate.</p> <p>2) Support policy making for developing cities safe from disasters in relation to own mandate.</p> <p>3) Support policy making for livelihood restoration of disaster victims.</p> <p>4) Support policy making for reconstruction of small and medium-sized enterprises and economic recovery.</p>
<p>Police (Other Law Enforcement Agencies)</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate.</p> <p>2) Conduct training and drills for staff management of police on disaster preparedness.</p> <p><u>Emergency Response Phase</u></p> <p>1) Put efforts on ensuring safety of residents, conduct patrols in the affected areas and vicinities, and provide information regarding safety for life.</p>
<p>Space and Upper Atmosphere Research Commission (SUPARCO)</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate.</p> <p>2) Prepare satellite image maps of natural disasters in the country and share them with NDMA.</p> <p>3) Monitor drought conditions of Pakistan. Share imagery maps with NDMA, PMD and Pakistan Agriculture Research Council.</p> <p>4) Develop procedures and mechanisms to access the remote sensing images and satellite maps by humanitarian Organizations for emergency preparedness and response.</p> <p>5) Provide remote sensing and satellite maps for hazard risk zones for planning and response.</p> <p>6) Coordinate and facilitate with NDMA, F/G/S/PDMAs on a regular basis in provision of satellite images for emergency preparedness and planning purposes.</p> <p>7) Provide services of Pakistan Communication Satellite (PAKSAT) for communications with disaster-hit areas.</p> <p>8) Provide services in disaster forecasting, monitoring and damage assessment using satellite and remote sensing technologies for floods, cyclones, oil spills, dust storms, droughts, earthquakes, tsunamis and glacier depletion.</p> <p>9) Establish appropriate facilities to acquire and process satellite data for study of storms, monsoons, cloud movements, dust storms, cloud tops, land and sea surface temperatures, and other meteorological atmospheric processes.</p> <p>10) Undertake studies/surveys on environmental conditions.</p> <p><u>Emergency Response Phase</u></p> <p>1) Provide remote sensing and satellite maps after disasters in order to show their impact.</p> <p>2) Provide remote sensing and satellite maps for hazard risk zones to enable relevant agencies to take measures for minimizing damage to population and property.</p> <p>3) Prepare post-disaster imagery maps.</p>

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<p>Survey of Pakistan</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Prepare hazard risk maps of natural disasters in the country and share them with NDMA. 3) Provide disaster maps for hazard risk zones for planning and response. 4) Coordinate and facilitate with NDMA, F/G/S/PDMAs on a regular basis in provision of hazard risk maps for emergency preparedness and planning purposes. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Provide hazard risk maps. 2) Prepare post-disaster imagery maps.
<p>Traffic Police</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Conduct training and drills for staff management of police on disaster preparedness. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Enforce traffic control in collaboration with road management bodies and EOCs.
<p>FFC (Dams Safety Council)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Carry out periodic inspections of dams and advise WAPDA and provincial governments regarding repairs and maintenance of dams and reservoirs. 3) Review the plans of new dams to ensure adequate safety of structures. 4) Review the plans and specifications for enlargement, modifications, major repairs, revival or abandoning of dams/reservoirs. 5) Keep close liaison with International Commission on Large Dams based in Paris. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the National Emergency Operations Centre. 2) Monitor the situation of dams and power supply facilities and report to Ministry of Water and Power on a regular basis. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Decide fundamental orientation of rehabilitation and reconstruction in relation to own mandate. 2) Decide policy on rehabilitating damaged facilities in relation to own mandate. 3) Support formulation of Reconstruction Plan in relation to own mandate. 4) Support policy making for developing cities safe from disasters in relation to own mandate.
<p>Federal Public Companies and Stakeholders</p>	
<p>Airline Companies</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Organizedrills on disaster preparedness and response. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Conduct a survey in affected airports and assess requirements of relief and recovery needs. 2) Provide helicopters, aircrafts, etc. for assessment, search and rescue and evacuation in complex emergencies, when required.

	3) Maintain close coordination with the Civil Aviation Authority during emergency response.
Banks	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Undertake analysis to identify high-risk areas for the banking sector lending programs. 2) Develop insurance and lending services against natural hazard risks for housing, industrial and infrastructure sectors. 3) Coordinate with relevant city authorities or NDMA to receive guidelines for construction of banks in high-risk areas. 4) Encourage implementation of safer construction guidelines by the bank beneficiaries (including individuals and companies). <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Give financial support for rehabilitation and reconstruction. 2) Provide low interest loans for victims for livelihood recovery.
Ambulance Services	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Develop capacity of Ambulance Services in disaster preparedness and response. 3) Conduct training for volunteers in first aid, evacuation, and emergency response. 4) Hold community-based disaster preparedness and emergency response training workshops. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Assist DDMA's in evacuation process in the affected area. 2) Provide ambulance service for the transportation of injured and dead bodies to the hospital. 3) Provide first aid to the injured people. 4) Provide relief items e.g., food, clothes, kitchen sets, etc. 5) Provide rescue and medical services to the affected population. 6) Coordinate with NDMA, F/G/S/PDMA's, DDMA's, NGOs, INGOs, and relief agencies for emergency response. 7) Coordinate with DM authorities and UN agencies for post-disaster relief work.
Hospitals	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Develop the capacity of hospital in disaster preparedness and response. 3) Conduct training for staff in first aid, evacuation, and emergency response. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Check the safety of hospital buildings and facilities and confirm safety of utilization of the hospital for emergency operation. 2) Provide medical services for injured people. 3) Coordination with NDMA, F/G/S/PDMA's, DDMA's, NGOs, INGOs, relief agencies for emergency response. 4) Coordinate with DM authorities and UN agencies for post-disaster relief work. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Rehabilitate and reconstruct the hospital if needed.
Insurance Sector	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare an insurance scheme for disasters.

<p>Landline Telecommunications Companies (NTC, PTLC)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Prepare a telecommunication strategy on emergency response. 3) Conduct an annual conference on the role of telecommunications in disaster management. 4) Assess the vulnerability of telecommunication system. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Secure important communication among relevant disaster management agencies. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Recover telecommunication if needed.
<p>Media</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare a communication strategy on emergency response. 2) Document and broadcast good practices on emergency response. 3) Develop an awareness strategy for public for emergency response period. 4) Broadcast public messages on disaster related issues. 5) Allocate airtime for emergency response programs. 6) Organize awareness programs for media journalists in relation to media role in emergency response. 7) Conduct annual conferences on role of media in disaster management. 8) Provide analysis on sources and process of risk generation and patterns of risk and vulnerabilities. 9) Disseminate warning messages to at risk communities in an easy to understand language through multiple channels, while being sensitive to people's access and timing issues. 10) Provide information to communities about precautionary measures they can take to avoid loss of life and property from hazards. 11) Advocate to decision-makers to take appropriate actions for disaster risk management. 12) Highlight the need for involvement of communities in disaster preparedness. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Provide timely and factual information to the public during emergency response. 2) Influence decision-makers to take immediate and appropriate action for emergency response. 3) Relay public awareness messages on health and other issues that will help to reduce the human losses. 4) Highlight needs and issues of survivors during the disaster time. 5) Curtail normal programs to broadcast essential information on emergency response. 6) Inform the public with timely and factual information about the extent of disaster, losses caused and the current situation of hazards. 7) Advise the public on actions to be taken during the emergency period in order to avoid further losses, e.g., evacuation, unsafe areas, and water purification techniques. 8) Inform on actions being taken by authorities/aid groups to save lives and property. 9) Relay messages concerning welfare of isolated or trapped groups for the benefit of families, relatives, friends and rescue teams. 10) Facilitate communication among affected people and their relatives, friends, families in other parts of the country or world. 11) Highlight the needs of survivors to make sure that all groups of people

	<p>affected by the disaster receive appropriate aid, irrespective of their social, ethnic, or political status.</p> <ol style="list-style-type: none"> 12) Highlight the need for application of minimum standards to ensure that the minimum needs of disaster survivors in terms of water, sanitation, shelter, food and health are met. 13) Communicate on potential secondary risks to minimize further loss or damage. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Appeal for assistance from all parties to meet the needs of survivors. 2) Communicate on rehabilitation and Reconstruction Plans of authorities, UN and NGOs, others in the affected areas. 3) Encourage survivor participation in recovery through conducting surveys and communicating the opinions of public to authorities. 4) Provide positive influence for integrating risk reduction in rehabilitation and reconstruction programs.
<p>Mobile Telecommunication Companies</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Prepare a mobile telecommunication strategy on emergency response. 3) Conduct annual conferences on role of mobile telecommunication in disaster management. 4) Assess the vulnerability of the telecommunication system. 5) Develop and install an information system utilizing SMS. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Secure important communication among relevant disaster management agencies. 2) Provide disaster information and evacuation calls by utilizing SMS. <p><u>Post-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Recover telecommunication if needed.
<p>Pakistan Humanitarian Forum</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Develop the capacity of Pakistan Humanitarian Forum in disaster preparedness and response. 3) Conduct training for volunteers in first aid, evacuation, and emergency response. 4) Hold community-based disaster preparedness and emergency response training workshops. 5) Organize seminars and workshops on disaster related issues to influence the government and donors to allocate more resources to relief and recovery. 6) Promote Sphere Project minimum standards in disaster response. 7) Document good practices and share them with PHF members NDMA, F/G/S/PDMAs and DDMA. 8) Organizedisaster preparedness training programs for community-based Organizations, NGOs and elected councilors at the UC level. 9) Develop IEC material on disaster related issues for preventive measures in local languages. 10) Explore ways and develop strategies to work with NDMA, F/G/S/PDMAs and DDMA in disaster and non-disaster times. 11) Organize evaluations of the emergency response and rehabilitation programs. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Assist DDMA in evacuation process in the affected areas.

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	<ol style="list-style-type: none"> 2) Provide ambulance services for rescue and transporting injured people. 3) Provide medical services to the affected population. 4) Coordinate with NDMA, F/G/S/PDMAs, DDMA, NGOs, INGOs, and relief agencies for emergency response. 5) Coordinate with DM authorities and UN agencies for post-disaster relief work. 6) Designate a representative in the NEOC, if needed. 7) Organize/conduct joint assessment and share report with PHF members, NDMA, F/G/S/PDMAs and DDMA. 8) Assist DDMA in emergency response. Provide relief support food and non-food items to the affected population. 9) Ensure that PHF members follow the Sphere Project minimum standards in disaster response. 10) Design a coordinated joint response in light of the assessment report findings. 11) Closely work with NDMA, F/G/S/PDMAs and DDMA during the disaster time.
<p>Pakistan Red Crescent Society (PRCS)</p>	<p><u>Pre-Disaster Phase</u></p> <ol style="list-style-type: none"> 1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Ensure that all PRCS branches have developed a preparedness plan at the district level with close coordination of local government. 3) Provide financial and technical support to the branches for preparedness activities. 4) Compile an inventory of resources for emergency response. 5) Develop the capacity of PRCS district level branches in disaster preparedness and response. 6) Conduct training to promote Humanitarian Charter and Sphere minimum standards in disaster response in PRCS branches. 7) Conduct training for volunteers in first aid, evacuation, and emergency response. 8) Hold community-based disaster preparedness and emergency response training workshops. 9) Formulate development plans in concert with NDMA. 10) Develop a roster of blood donor volunteers at branch and HQ levels and share it with DDMA, F/G/S/PDMAs and NDMA. 11) Develop teams of volunteers for disaster preparedness and response. 12) Train volunteers in emergency preparedness and response (e.g., evacuation, first aid, fire fighting, early warning etc.). 13) Implement community level programs on disaster risk reduction and preparedness including drills and simulations. <p><u>Emergency Response Phase</u></p> <ol style="list-style-type: none"> 1) Designate a representative to the NEOC, P/R/SEOCs and DEOCs (as applicable). 2) Assist DDMA in evacuation process in the affected areas. 3) Provide ambulances for rescue and transporting injured people. 4) Provide medical services to the affected population. 5) Coordination with NDMA, F/G/S/PDMAs, DDMA, NGOs, INGOs, relief agencies for emergency response. 6) Coordinate operations of national and international components of Red Cross/Red Crescent Movements, operating in disaster affected areas. 7) Coordinate with DM authorities and UN agencies for post-disaster relief work. 8) Launch an appeal for international assistance through the IFRC and the ICRC.

	<p>9) Work closely with local authorities to conduct joint assessments of damage, losses and needs of disaster survivors.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Support livelihood restoration of disaster victims. 2) Support policy making for reconstruction of small and medium-sized enterprises and economic recovery.</p>
<p>Sui Northern Gas Pipeline Limited (SNGPL)</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Assess the vulnerability of gas facilities, infrastructure and services to disasters. 3) Integrate vulnerability reduction methods in construction of new gas facilities. 4) Implement vulnerability reduction strategies for existing infrastructure, facilities and services. 5) Conduct training and drills for staff management of SNGPL on disaster preparedness.</p> <p><u>Emergency Response Phase</u></p> <p>1) Secure safety of the gas pipeline network and if any damage is observed, promptly respond for recovery.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Recover the gas supply network if needed.</p>
<p>Sui Southern Gas Pipeline Limited (SSGPL)</p>	<p><u>Pre-Disaster Phase</u></p> <p>1) Prepare disaster management operation plan and emergency preparedness plan with regards to the mandate. 2) Assess the vulnerability of gas facilities, infrastructure and services to disaster. 3) Integrate vulnerability reduction methods in construction of new gas facilities. 4) Implement vulnerability reduction strategies for existing infrastructure, facilities and services. 5) Conduct training and drills for staff management of SNGPL on disaster preparedness.</p> <p><u>Emergency Response Phase</u></p> <p>1) Secure the safety of the gas pipeline network and if any damage is observed, promptly respond for recovery.</p> <p><u>Post-Disaster Phase</u></p> <p>1) Recover the gas supply network if needed.</p>

APPENDIX – III

Meetings and Consultative Workshop

Meetings and Consultative Workshop

List of Meetings of Committees/Workshops

	Committees	Date
1.	1 st Steering Committee	April 27 th , 2010
2.	Technical Committee	May 21 st , 2011
3.	2 nd Steering Committee	November 3 rd , 2011
4.	Technical Committee	February 8 th , 2012
5.	3 rd Steering Committee	February 9 th , 2012
6.	Technical Committee	February 16 th , 2012
7.	Technical Committee	February 28 th , 2012
8.	Technical Committee	March 8 th , 2012
9.	Technical Committee	June 1 st , 2012
10.	4 th Steering Committee	June 25 th , 2012
	Workshops	Date
1.	1 st Workshop	June 25 th , 2010
2.	2 nd Workshop	October 28 th , 2010
3.	3 rd Workshop	November 12 th , 2010
4.	Consultative Workshop	June 30 th , 2011

Members of Committees

Members of the Steering/Technical Committee
• National Disaster Management Authority
• Pakistan Meteorological Department
• Federal Flood Commission
• Economic Affairs Division*
• F/G/S/PDMAs (Punjab, Sindh, Khyber Pakhtunkhwa, Balochistan, FATA, GB, AJ&K)
• JICA Pakistan Office**
• JICA Expert Team

* Economic Affairs Division is a member of the Steering Committee only.

** JICA Pakistan Office is a member of the Steering Committee only.

List of Participants of Steering Committee Meeting February 9, 2012

Sr.No	Name of the Participants/Designation	Name of the Department
1.	Dr. Zafar Iqbal Qadir, Chairman	NDMA
2.	Mr. Jamil Anwar, Joint Secretary (Japan/ADB)	EAD
3.	Mr. Tahir Munir Minhas, Director General	PDMA, Balochistan
4.	Syed Zahoor-ul-Hassan Gillani, Director General	SDMA, AJK
5.	Mr. Shahzad Khan Bangash, Director General	PDMA, KP
6.	Mr. Arshad Khan, Director General	FDMA
7.	Syed Zain Gillani, Deputy Secretary (Japan)	EAD
8.	Mr. Rashid Kamal-ur-Rehman, Director	PDMA, Punjab
9.	Syed Sajjad Hayder, Director	PDMA, Sindh
10.	Mr. Fayyaz Shah, Provincial Coordinator	SDMA, AJ&K
11.	Mr. Faisal Khatak, DRM Expert	FDMA
12.	Mr. Alamgir Khan , Chief Engineer (Floods)	Federal Flood Commission
13.	Mr. Arif Mahmood, Director General	Pakistan Meteorological Department
14.	Mr. Ahmed Kamal, Member (DRR)	NDMA
15.	Syed Sibte-e-Abbas Zaidi, Director (DRR)	NDMA
16.	Mr. Muhammad Ajmal Bhatti, Deputy Director (DRR)	NDMA
17.	Mr. Mahmood A. Jilani	JICA Pakistan Office
18.	Mr. Tomohiro Kozono	-do-
19.	Mr. Toshiya SATO	-do-
20.	Mr. Ichiro Kobayashi, Team Leader	JICA Study Team
21.	Mr. Kazuto Suzuki	-do-
22.	Dr. Yoshihiro Asano	-do-
23.	Dr. Ryo Matsumaru	-do-
24.	Tomoko Shaw	-do-
25.	Mr. Kenji Mori	-do-
26.	Mr. Ryoji Takahashi	-do-
27.	Mr. Masamachi Sunada	-do-
28.	Mr. Jalil ur Rehman	-do-
29.	Mr. Mukhtar Ahmed Khan	-do-
30.	Ms. Azusa Matsui	-do-
31.	Mr. Taichi Ogino	-do-

*Appendix-II Roles & Responsibilities
(Geological Hazards and Meteorological Hazards)*

List of Participants in Technical Committee, February 8, 2012

No.	Name of the Participants/Designation	Name of the Department
1	Mr. Tahir Munir Minhas, Director General	PDMA, Balochistan
2	Syed Zahoor-ul-Hassan Gillani, Director General	SDMA, AJ&K
3	Mr. Fayyaz Shah, Provincial Coordinator	SDMA, AJ&K
4	Syed Sajjad Hayder, Director	PDMA, Sindh
5	Mr. Rashid Kamal-ur-Rehman, Director	PDMA, Punjab
6	Mr. Asghar Ali, Director	PDMA, KP
7	Mr. Faisal Khatak, DRM Expert	FDMA
8	Mr. Hazrat Mir, Chief Meteorologist	Pakistan Meteorological Department
9	Mr. Syed Mujtaba Hussain, Deputy Secretary	M/o Disaster Management
10	Mr Mubushar Hussain, Mainstreaming Expert	UNDP, One UN DRM
11	Qazi Tallat M. Siddique, Deputy Engineering Advisor (Civil)	Federal Flood Commission (FFC)
12	Mr. Alamgir Khan, Chief Engineer (Floods)	Federal Flood Commission
13	Mr. Ahmed Kamal, Member (DRR)	NDMA
14	Mr. Ahmed Raza Sarwar, Director (R&R)	NDMA
15	Syed Sibte-e-Abbas Zaidi, Director (DRR)	NDMA
16	Mr. Muhammad Ajmal Bhatti, Deputy Director (DRR)	NDMA
17	Maj. Javaid Akhtar, Deputy Director (Ops)	NDMA
18	Mr. Mahmood A. Jilani	JICA Pakistan Office
19	Mr. Ichiro Kobayashi, Team Leader	JICA Study Team.
20	Mr. Kazuto Suzuki	-do-
21	Dr. Yoshihiro Asano	-do-
22	Dr. Ryo Matsumaru	-do-
23	Ms. Tomoko Shaw	-do-
24	Mr. Kenji Mori	-do-
25	Mr. Ryoji Takahashi	-do-
26	Mr. Masamachi Sunada	-do-
27	Mr. Jalil ur Rehman	-do-
28	Mr. Mukhtar Ahmed Khan	-do-
29	Ms. Azusa Matsui	-do-

List of Participants in Technical Committee, February 28, 2012

No.	Name of the Participants /Designation	Name of the Department
1	Mr. Shahzad Khan Bangash, Director General	PDMA, KP
2	Mr.Asghar Ali, Director	PDMA, KP
3	Mr. Danish Saeed, Director General	PDMA, Sindh
4	Mr. Waseem Ahmed , Liaison Officer	PDMA, Sindh
5	Sardar Muhammad Nawaz Khan, Secretary	SDMA, AJK
6	Mr. Fayyaz Shah, Provincial Coordinator	SDMA, AJK
7	Mr. Rasid Kamal-ur-Rehman, Director	PDMA, Punjab
8	Mr. Naseebullah Khan, DRM Coordinator	PDMA, Baluchistan
9	Mr. Zaheer-ud-Din, Assistant Director	GBDMA
10	Mr. Faisal Khatak, DRM Expert	FDMA
11	Mr. Jan Muhammad Khan, Director	Pakistan Meteorological Department
12	Mr.Alamgir Khan, Chief Engineer (Floods)	Federal Flood Commission
13	Qazi Tallat M. Siddique, Deputy Engineering Advisor (Civil)	Federal Flood Commission
14	Mr. Mahmood A.Jilani	JICA Office, Islamabad
15	Mr. Ahmed Kamal, Member	NDMA
16	Syed Sibte-e-Abbas Zaidi, Director	NDMA
17	Mr. Idress Masud, Director	NDMA
18	Mr. Tomohiro Kozono	JICA Office, Islamabad
19	Mr. Taichi Ogino	JICA Study Team
20	Mr. Takashi Onuma	JICA Study Team
21	Mr. Mukhtar Ahmed Khan	JICA Study Team

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List of Participants in Technical Committee, March 8, 2012

No.	Name of the Participants/Designation	Name of the Department/Address
1	Mr. Danish Saeed, Director General	Provincial Disaster Management Authority, 52-C, Block No.2, KDA Scheme-5, Clifton, Karachi
2	Mr. Waseem Ahmed Liaison Officer	
3	Mr. Rashid Kamal-ur-Rehman, Director (Admn)	Provincial Disaster Management Authority, 40-A, Lawrence Road, Lahore
4	Mr. Asghar Ali Director	Provincial Disaster Management Authority, Civil Secretariat, Peshawar
5	Mr. Zia Ahmed Khawaja Director (Administration)	State Disaster Management Authority, Opposite High Court Building, Muzaffarabad
6	Mr. Naseebullah Khan DRM Coordinator	Provincial Disaster Management Authority, Food Grain Silos, Shaikh Manda, Airport Road, Quetta
7	Mr. Fayyaz Shah, Provincial Coordinator	SDMA, AJK, Muzaffarabad.
8	Mr. Faisal Khattak, DRM Expert	FATA Disaster Management Authority, 38-II-D, Old Jamrud Road, University Town, Peshawar
9	Mr. Zaheer-ud-Din Babar, Assistant Director	Gilgit-Biltistan Disaster Management Authority, Babar Chowk, Chirar Bagh Gilgit
10	Mr. Alamgir Khan, Chief Engineer Floods	Federal Flood Commission, Sector G-5, Islamabad
11	Qazi Tallat M. Siddique, Deputy Engineering Advisor	
12	Mr. Jan Muhammad Khan, Director	Pakistan Meteorological Department, Sector H-8, Islamabad
13	Mr. Ahmed Kamal Member (DRR)	NDMA, Islamabad.
14	Syed Sibte-Abbas Zaidi Director (DRR-II)	NDMA, Islamabad.
15	Mr. Idress Masud Director (DRR-I)	NDMA, Islamabad.
16	Mr. Muhammad Ali Randhawa Deputy Director (R&R/P&L)	NDMA, Islamabad.
17	Mr. Tomohiro Kozono, Representative	JICA Office, Islamabad
18	Mr. Mahmood A. Jilani, TI, Deputy Resident Representative/ Chief Programme Officer	JICA Office, Islamabad
19	Mukhtar Ahmed Khan, Coordinator	JICA Study Team, Islamabad

List of Participants in Technical Committee June 1, 2012

Sr.No	Department	Name of Participant(s)
1	Pakistan Meteorological Department	Mr. Muhammad Riaz, Chief Meteorologist
2.	Federal Flood Commission	Qazi Tallat M. Siddiqui, Deputy Engineering Advisor
3.	PDMA, Punjab	Mr. Muhammad Wajahat, PDRMC, Punjab
4.	PDMA, Sindh	Ikhlaq Qureshi, Director (Operations)
5.	PDMA, KP	Mr. Asghar Ali, Director (Administration)
6.	PDMA, Balochistan	Nasibullah Khan Bazai Provincial DRM Coordinator
7.	SDMA, AJ&K	Mr. Zia Ahmed Khawaja, Director
8.	FDMA, FATA	Mr. Farman Ali Khilji, Deputy Director (Operation & relief)
9.	JICA Pakistan office	Mr. Tomohiro Kozono, Representative
10.		Mr. Mahmood A. Jillani, Deputy Resident Representative
11.		Mr. Mukhtar Ahmed Khan
12.	NDMA	Mr. Ahmed Kamal, Member (DRR)
13.	NDMA	Syed Sibte-e-Abbas Zaidi, Director (DRR-II)
14.	NDMA	Mr. Muhammad Ajmal Bhatti Deputy Director (DRR-II)
15.	NDMA	Mr. Abdul Latif, Assistant Director (DRR-II)
16.	NDMA	Mr. Safiullah Tariq Research Associate

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List of Participants in Consultative Workshops, June 30, 2011

No.	Participants	Designation	Organization
1	Muhammad Iqbal	A.D (Training)	Civil Defence, Islamabad
2	Abrar Hussain	A.D	
3	Mr Sumair Saeed	Director	Civil Aviation Authority CAA, Islamabad
4	Mr Naveed Nawaz	GM	
5	Ms. Farzana Iltaf Shah	Dy. Director	PAK EPA, Islamabad
6	Mr Sanaullah	S.O (Emergency Relief Cell)	Cabinet Division
7	Dr Athar Qayyum	Director	Ministry of Health, NHEPRN
8	Dr Badar Uddin Abbasi	-	
9	Mr Nasir Ali Khan	Producer	Radio Pakistan
10	Mr Shakir Baloch	Director (M)	
11	Dr Aurangzeb Khan	Chief Environment, Project Director	Environmental Section, M/o Planning & Development
12	Captain Muhammad Aslam Shaheen	Chief Nautical Surveyor, D.G	M/o Port and Shipping
13	Mr Abdul Hameed	Assistant Manager (QS&C)	Pakistan Council of Scientific and Industrial Research (PCSIR)
14	Mr Sheikh Fayyaz Ahmed	PSO (M.D)	Pakistan Tourism Development Corporation (PTDC)
15	Mr Ali Mahmood	Director, Member (Telecommunication)	Ministry of Information Technology
16	Mr Ishahad Ahmed	GM (P&D)	WAPDA
17	Mr Mushtaq Ahmed	Chief Engineer (H&WM)	
18	Mr Muzammil	Deputy Director (Dams)	
19	Mr Mujahid Tanveer	Deputy Director	
20	Mr Maqbool Hussain Bangash	S.D.S. (LA&R)	
21	Mr Waseem	Argonomiest (LA&R)	
22	Ms. Jawaria Khan	A.S.D.S (LA&R)	
23	Mr Mazhar Ali Shah	Chairman	Indus Water System Authority
24	Mr Khawaja Abdul Basit	President	Future Leaders of Paksitan
25	Brig ® Amir Mumtaz	-	ERRA
26	Lt Col. ® Akhtar Ahmed	-	
27	Dr Imran Khan	D.G	Geological Survey of Pakistan
28	Muhammad Irfan	Dy.D.G	National Housing Authority

No.	Participants	Designation	Organization
29	Mr. Qasir M. Siddiqui	Director	
30	Mr. Javed Akbar	Deputy Director	
31	Brig Mansoor Aslam	D.G	National Logistic Cell
32	Lieutenant Colonel Muhammad Rahid Abbasi	-	Engineering in Chief, Pakistan Army
33	Mr. Arif Mahmood	D.G	PMD
34	Mr. Hazart Mir	Chief Met	
35	Mr. Jan Muhammad Khan	-	
36	M. Qanateer Ahmed	Executive Engineer	Pak PWD
37	Mr. Safdar Ali, S.S.	-	
38	Syed Zuhair Bokhari	Director	SUPARCO
39	Mr. Ghulam Sarwar	Director, Surveyor General	Survey of Pakistan
40	Dr Rizwan Naseer	DG	Rescue 1122
41	Dr Abdur Rehman	DE	
42	Mr. Faheem Ahmed Qureshi	Dy. Director	
43	Mr. Ali Hussain	E.O	
44	Ms. Deebea	PRO	
45	Mr. Amjad Latif	Actg. SGM (D)	SNGPL
46	Brig ® Mukhtar Ahmed	Director General (Security)	SSGPL
47	Syed Uzair Bukhari	Director	SPARCO
48	Mr. Nisar Ahmed	Assistant Director	PDMA, PUNJAB
49	Asghar Ali	D.G	PDMA, K.P
50	Mr. Suleman Aziz	Assistant Director	PDMA, Balochistan
51	Mr. Zia Ahmed Khawaja	D.G (Acting)	SDMA, AJ & K
52	Mr. Muhammad Haseeb Khan	Assistant Director	FATA DMA, FATA
53	Mr. Atta Ur Rehman	-	Commissioner, Peshawar
54	Col ® Masood Ali	-	UNDP / One UN DRM
55	Ms.Rabia Khattak	-	
56	Ms. Hira Hashmey	-	
57	Mr. Mubushar Hussain	-	
58	Ms. Najma Akbar	-	UNOCHA
59	Mr. Zulqiquar Rao	Acting Representative	WFP

*Appendix-II Roles & Responsibilities
(Geological Hazards and Meteorological Hazards)*

No.	Participants	Designation	Organization
60	Mr. Shoail Tayyab	Program Manager	AUSAID
61	Mr. Takatoshi Nishikata	Chief Rep.	JICA Pakistan Office
62	Mr. Tomihiro Kozono	Reprehensive	
63	Mr. Mahmood A. Jilani	Rep.	
64	Mr. Muhammad Zubair	PRO	
65	Janne Simpson	Head of DFID	British High Commission
66	Tassuaquq Shah	-	Plan International
67	Huwda Yaqub	-	
68	Mr. Ijaz Hussain	M&E Officer	FOUCS
69	Mis. Samina	CEO	SUNGI Foundation
70	Mr. Aman Ali	Executive Director	
71	Mr. Atib Siddique	-	Pakistan Red Crescent
72	Mr. Ubaid Ullah	-	
73	Dr. M. Nasrullah Khan	-	National University of Science and Technology
74	Maj Gen. Javed Mahmood Bukhari	-	
75	Capt. Abdul Sattar Raja	-	
76	Mr. Junaid M.G Kiani	COO	Bahria University
77	Mr. Ali Arsalan	-	
78	Mr. Adil	-	
79	Prof. Dr. Amir Nawaz	-	Center for Disaster Preparedness and Management, Peshawar
80	Mr. Kamal Ahmed	Lecturer	
81	Dr. Muhammad Pervaz	-	Hydro-carbon Development Institute of Pakistan
82	Mr. Hilal A. Raza	-	
83	Ms. Sobia Asad	-	SBZ, Associate
84	Dr. Nasim Khan	-	Rector, Hamard University
85	Mr. Aurangzeb Khan	-	
86	Mr. Fayyaz Baqir	Director	A.K Resources
87	Mr. Humayun Sabir	-	LG & RD, Quetta
88	Ms. Shamsah Kausar	-	UNDP
89	Mr. Asim Murtaza Khan	M.D	Pakistan Petroleum Limited
90	Mr. Munir Kamal Jadun	C.C.D	

No.	Participants	Designation	Organization
91	Mr. Haroon Ur Rashid	-	
92	Mr. Hamid Sarfaraz	-	International Union for Conservation of Nature
93	Mr. Abdul Latif Rao	Chairman	R-SDCS
94	Ashique Ahmed	-	World Wild Forum
95	H.E Rauf Engin Soysal, Special Envoy of the UN Secretary General C/o UNRC	-	Secretary General UNRC
96	Ms. Carmen Van Heese	-	
97	Ms. Qudisa Sadiq	-	Project Manager-UMT Consulting
98	Ms. Sara Khan	-	Search for Common Ground
99	Mr. Umar Saqib, Chairman	Chairman	SHUA Pakistan
100	MS. Lise Albrechtsen	Second Development Secretary	Royal Norwegian Embassy
101	Mr. Imran Rashid Mirza	Manager	Mitsubishi Corporation
102	Mr. Imran Zafar	-	
103	Mr. Naru Otsubo	Secretary	Embassy of Japan
104	Dr. Junaid	Chairman	National Management Consultant
105	Mr. Ali Saleem	Country Director	Search For Common Ground (SFCG)
106	Mr. Kamran Lashari	Advisor	SPU-NDMA
107	Mr. Kaleem Ahmed	-	RSPN
108	Burhan Razi	-	
109	Mr. Zubair Khan	-	MOJZ Foundation
110	Mr. Indejeet Singh	-	
111	Mr. Rahmat	-	ECHO
112	Dr. Aqeel Ahmed	-	E-in-C Bran
113	Mr. Junaid Shaukat	-	NADRA
114	Jase Tulk	-	Canadian Embassy
115	Mr. Malik Qaisar Majeed	Joint Sec.	Kashmire Council / G.B
116	Dr. Zafar Qadir	Chairman	NDMA
117	Mr. Ahmed Kamal	M (DRR)	
118	Brig. Sajjad Naeem	M (Ops)	
119	Mrs Anjum Assad Amin	M (S&S)	

Appendix-III Meetings and Consultative Workshop

No.	Participants	Designation	Organization
120	Ms. Aaisha Makhdum	Director	
121	Syed Sibte-Abbas Zaidi	Director	
122	Ms. Bushra Hussain	A.D	
123	Mr Hassan Zulfiqar	-	
124	Mr Naeem Iqbal	UNDP/NDMA	
125	Mr Haroon	-	
126	Mr Zeeshan	-	
127	Mr Amir	-	
128	Ms. Zeb un Nisa	UNDP/NDMA	
129	Mr Malik Qasir Majeed	-	
130	Ms. Tanzila Shaukat	Librarian	
131	Mr Tariq Mahmood	-	
132	Mr Bilawal Ali	-	
133	Mr Muhammad Irfan	-	
134	Mr Rana Muhammad Sohail	-	
135	Mr Abdul Shakoor	-	
136	Mr Ichiro Kobayashi	Team Leader	JICA Expert Team
137	Mr Yoshihiro Asano	Deputy Team Leader	
138	Mr Kazuto Suzuki	Deputy Team Leader	
139	Mr Roji Takahashi	-	
140	Ms. Tomoko Shaw	-	
141	Ms. Azusa Matsui	-	
142	Mr Taichi Ogino	-	
143	Mr Ryo Matsumaru	-	
144	Mr Hajime Tanaka	-	
145	Mr Mukhtar Ahmed Khan	-	
146	Mr Jalil Ur Rehman	-	
147	S.A. Hussain	ADC D , ICT	Islamabad Capital Territory

List of Participants of NDMP Steering Committee Meeting Held on 25-06-2012

Sr.No	Name of the Participants/Designation	Name of the Department
1.	Dr. Zafar Iqbal Qadir, Chairman	NDMA
2.	Mr. Arif Mahmood, Director General	Pakistan meteorological Department
3.	Mr. Sajjad A. Shaikh, Joint Secretary	Economic Affairs Division
4.	Mr. Ahmed Kamal, Member (DRR)	NDMA
5.	Mr. Tahir Munir Minhas, Director General	PDMA, Baluchistan
6.	Mr. Danish Saeed, Director General	PDMA, Sindh
7.	Mr. Alamgir Khan, Chief Engineer (Floods)	Federal Flood Commission
8.	Syed Zain Gillani, Deputy Secretary	Economic Affairs Division
9.	Mr. Waqar H. Abbassi, Deputy Secretary	Ministry of Climate Change
10.	Dr. Qazi Tallat Mehmood Siddiq, Deputy Engineering Advisor (Civil)	Federal Flood Commission
11.	Mr. Shaker Mahmood Mayo, Provincial Coordinator DRR Mainstreaming	PDMA, Punjab
12.	Mr. Ghulam Mustafa Abro, Provincial DRM Coordinator, Sindh	One UN-DRM Programme, PDMA, Sindh
13.	Mr. Vasif Shirwani, Provincial Coordinator DRR Mainstreaming	PDMA, Khyber Pakhtunkhaw
14.	Mr. Zia Ahmad Khawaja, Director	SDMA, AJ&K
15.	Mr. Amjad Bhatt, Coordinator	SDMA, AJ&K
16.	Mr. Mohammad Ajmal Bhattee, Deputy Director	NDMA
17.	Mr. Abdul Latif, Assistant Director	NDMA
18.	Mr. Mahmood A Jillani, Deputy Resident Representative	JICA
19.	Mr. Tomohiro Kozono, Representative	JICA
20.	Mr. Yoshitaka Inagaki, Representative	JICA
21.	Mr. Safiullah Tariq, Internee	NDMA
22.	Mr. Mukhtar Ahmed Khan, Coordinator, JICA Expert Team	JICA

APPENDIX – IV
Project Team

List of Project Team

S#	Name	Title
JICA Study Team		
1	Mr. Ichiro Kobayashi	Team Leader
2	Dr. Yoshihiro Asano	Deputy Leader/ Comprehensive DRM Plan
3	Mr. Kazuto Suzuki	Deputy Leader/Early Warning System
4	Mr. Noboru Ikenishi	Disaster Management Administration
5	Mr. Ryoji Takahashi	Disaster Management Administration
6	Mr. Keigo Ito	Flood and Sediment Disaster Management
7	Mr. Yoshitaka Yamazaki	Earthquake and Tsunami Disaster Management
8	Ms. Keiko Otoguro	Urban Disaster Management
9	Dr. Akihiro Furta	GIS/Database
10	Mr. Eric R. Lopes	GIS/Database
11	Ms. Tomoko Shaw	Community Based Disaster Management
12	Mr. Taichi Ogino	Social Survey/Public Involvement
13	Ms. Harumi Tsukahara	Disaster Education/Human Resource Development (2)
14	Mr. Masamichi Sunada	Capacity Building
15	Mr. Hajime Tanaka	Meteorology/Hydrology
16	Dr. Ryo Matsumaru	Human Resource Development (1)
17	Mr. Nobutaka Noguchi	IT System Planning
18	Mr. Kenji Mori	Equipment Planning (Weather Monitoring)
19	Mr. Toshihide Endo	Equipment Planning (Telecommunication)
20	Ms. Azusa Matsui	Administrator / Priority Program Management
21	Mr. Takashi Onuma	Flood Damage Assessment
22	Mr. Mukhtar Ahmed Khan Ganadapur	Coordinator
NDMA		
1	Dr. Zafar Iqbal Qadir	ChirmanNDMA
2	Mr. Ahmed Kamal	Member (DRR) & Project Director
3	Syed Sibte-e-Abbas Zaidi	Director (DRR-II)
4	Mr. Mohammad Ajmal Bhattee	Deputy Director (DRR-II)
5	Mr. Nadeem Ahmed Abro	Deputy Director (DRR-II)
6	Mr. Abdul Latif	Assistant Director (DRR-II)
7	Mr. Safiullah Tariq	Research Associate - DRR