



NATIONAL DISASTER MITIGATION PLAN - PAKISTAN REMODELED NDMP-II 2023

National Disaster Management Authority
Prime Minister's Office
Government of Pakistan



List of Acronyms

BHU	Basic Health Unit
CNG	Compress Natural Gas
COVID	Coronavirus Disease
DDMA	District Disaster Management Authority
DEOC	District Emergency Operation Center
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EOCs	Emergency Operation Centers
FFD	Flood Forecasting Division
GDP	Gross Domestic Product
GIS	Geographic Information System
GLOF	Glacial Lake Outburst Flood
HKH	Hindu Kush-Himalaya
HRF	Humanitarian Response Facilities
IASC	Inter-Agency Standing Committee
ICT	Islamabad Capital Territory
INGO	International Non-Government Organizations
JSHQ	Joint Staff Headquarter
KKH	Karakorum Highway
LPG	Liquid Petroleum Gas
MCH	Mother and Child Health
MIRA	Multi-Sector Initial Rapid Assessment
MHVRA	Multi-Hazard Vulnerability Risk Assessment
NDMA	National Disaster Management Authority
NDMP	National Disaster Management Plan
NDRMF	National Disaster Risk Management Fund
NEOC	National Emergency Operation Center
NIDM	National Institute of Disaster Management
NLC	National Logistic Cell



PDMA	Provincial Disaster Management Authority
PEOCs	Provincial Emergency Operation Centres
PIA	Pakistan International Airline
PMD	Pakistan Meteorological Department
PRCS	Pakistan Red Crescent Society
RHC	Rural Health Center
RS	Remote Sensing
SIMEX	Simulation Exercise
SOP	Standard Operating Procedure
SUPARCO	Space & Upper Atmosphere Research Commission
UC	Union Council
UN	United Nation
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
WAPDA	Water and Power Development Authority



Executive Summary

Pakistan is prone to various natural and human-induced hazards due to its diverse geographical characteristics and climatic variations. On top of that, the country's vulnerability is exacerbated by factors such as population growth, unplanned urbanization, exposure to vulnerable elements in hazard-prone areas, lack of institutional capacities, and climate change. To address these issues, there is a need for developing a National Disaster Mitigation Plan that includes standard guidelines for taking preventive measures against various hazards and explaining the standard operating procedures to meet emergencies in an organized manner engaging all government and non-government stakeholders at all levels.

This plan is indeed a successor document of National Disaster Management Plan-I which recently expired after achieving considerable numbers of milestones during 2012-2022. The NDMP-II shall serve as a comprehensive document that outlines the strategies and interventions set with a proactive approach enabling National and Provincial Disaster Management Authorities to prepare for and respond to emergencies in a coordinated manner. It identifies the roles and responsibilities of various stakeholders and outlines the necessary actions to be taken at each level to manage disasters. The plan focuses on building existing coping capacities and

previous experience in managing disasters by improving disaster preparedness and response mechanisms. This includes the operational procedure of the national emergency operation center, the need for developing contingency plans, conducting regular drills and simulation exercises, and maintaining a resource inventory. In addition, the establishment of coordination mechanisms is reiterated to effectively respond to disasters, including the operationalization procedure of emergency operation centers, activation of clusters, conducting rapid damage needs assessment and media management during emergencies. Last but not the least, the NDMP-II emphasizes the need for community involvement in disaster management and outlines strategies for building community resilience through public awareness campaigns, training, and capacity-building initiatives. It also highlights the importance of international cooperation and coordination in disaster response and recovery efforts.

Overall, the National Disaster Mitigation Plan-II for Pakistan is a critical tool for ensuring the country's preparedness and resilience to disasters and climate change. Its implementation will require the collaboration and commitment of all stakeholders to effectively manage disasters and minimize their impact on the population, economy, and environment.



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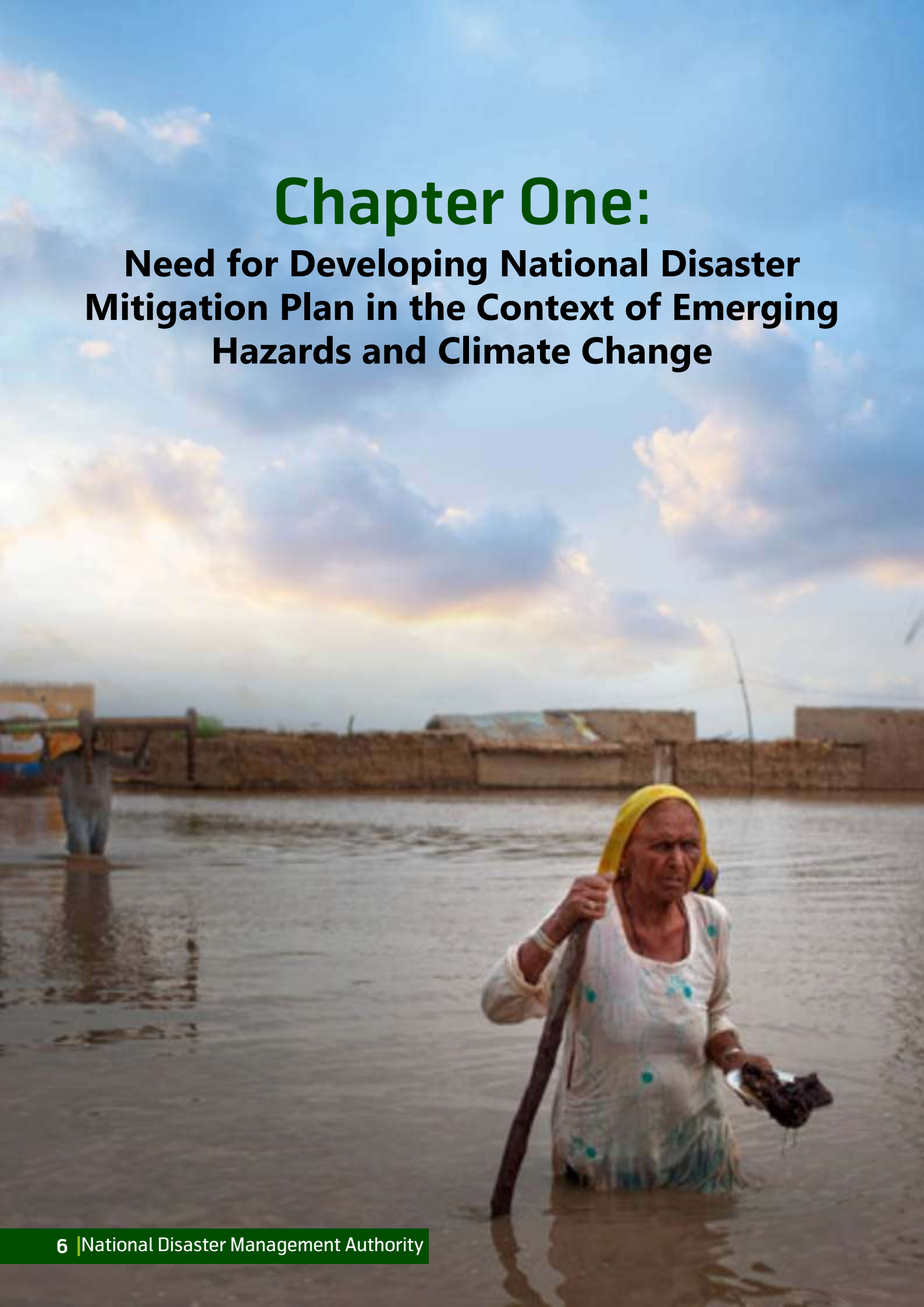


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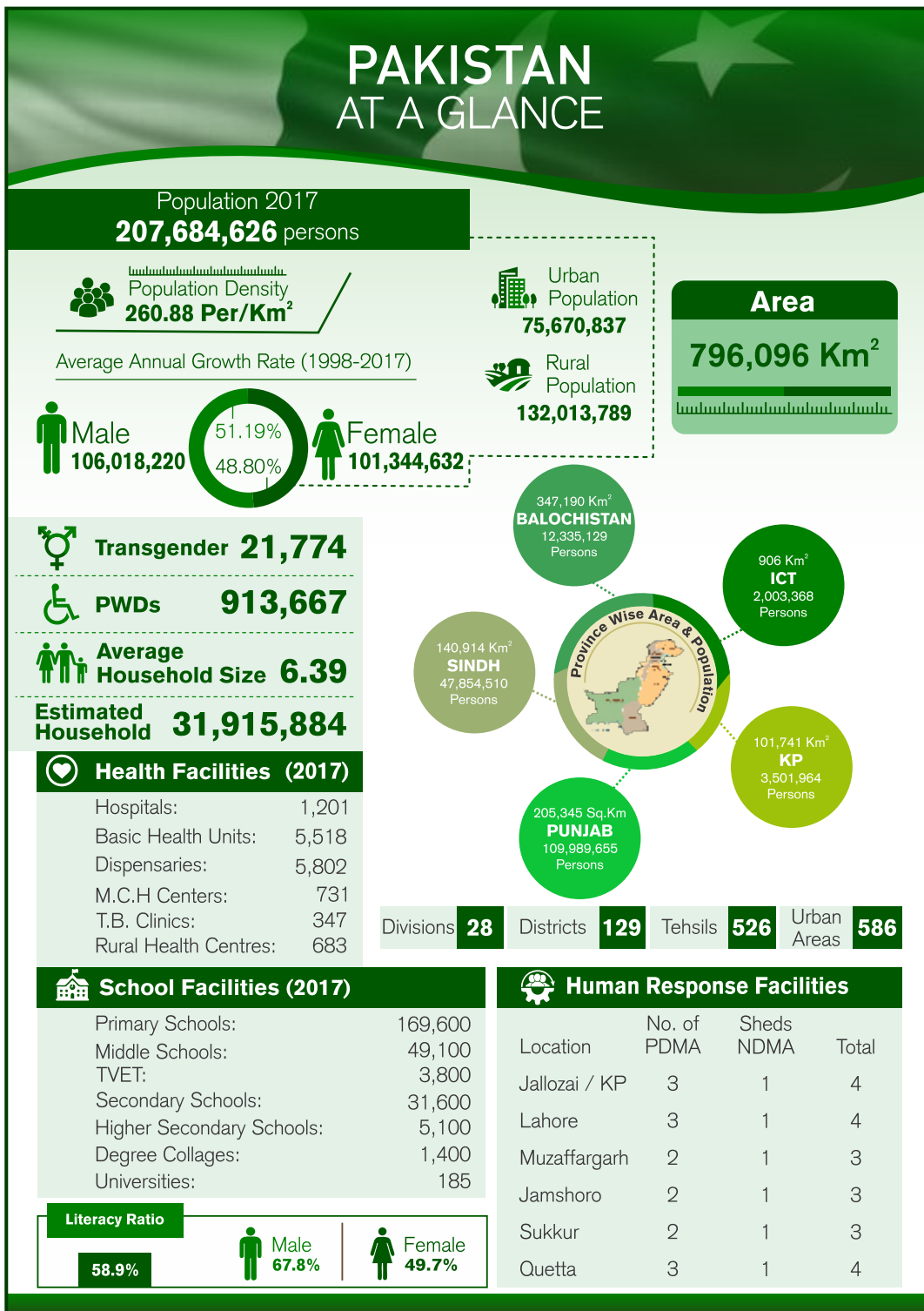
Chapter One:

Need for Developing National Disaster Mitigation Plan in the Context of Emerging Hazards and Climate Change





Chapter One: Need for Developing National Disaster Mitigation Plan in the Context of Emerging Hazards and Climate Change





1.1 Introduction

The recent increase in the natural disasters and its severity in terms of its frequency and magnitude have given the impetus for adopting a vibrant disaster risk management system at all levels. According to the Global Climate Risk Index 2021, Pakistan is among the top 10 countries badly affected by the climate change with annual average during 2000 to 2019^[1], while Pakistan is on 31st position in the world's ranking of emitting total greenhouses gases^[2]. Considering that climate change as an important factor in increasing the risk of hydro-meteorological disasters during recent years, there is an intense need to shift paradigm from reactive to proactive approach and further fully prepare for emergency response to reduce the consequences of disasters. Though considerable achievement can be observed after the establishment of disaster management authorities across the country, still lot more to do to increase awareness and develop resilience against future hazard's risk imposed by the climate change and human interactions with the natural processes.

In order to adopt a strategic direction, the National Disaster Management Authority have developed National DRR Policy in 2013, followed by developing National Disaster Management Plan 2012-2022 and National Disaster Response Plan in 2018. Under these strategic documents, significant milestones have been achieved across the country with the collaboration of government and non-government organizations. The National Disaster Mitigation Plan is a successor to the previous NDMP expired during last year 2022, while NDMA is in the process of developing long term National Disaster Management Plan 2025-2030, this plan will help in collecting strength to continue working together to

achieve set milestones mentioned at the end of this plan.

1.1.1. Vision

The vision of the NDMP-II is "to enhance the capacities required for reducing risks and building disaster and climate resilience at all levels".

1.1.2. Mission

To manage disasters by contributing to all phases of the disasters management cycle and further to adopt a strategic approach by setting target interventions for implementation with the collaboration of counterparts to strengthen the capacities of all stakeholders to prepare for any emergency/disaster in well-coordinated manners.

1.1.3. Objectives

The objectives of plan are:

- To functionalize a robust disaster risk management system with focus on its institutionalization at the grass root levels.
- To analyze the natural and human-induced hazards including hydro-meteorological hazards induced by the climate change, with a view to identify where and when these threats are likely to occur and in what frequency.
- To identify and prioritizing at risk districts for future implementation of projects for reducing the consequences of disasters and develop resilience against disasters and climate change.
- To provide a strategic direction in all three phases of the disaster management cycle considering preparedness as an utmost priority for an effective emergency response.
- To set priority interventions for



implementation with the support of counterparts to develop disaster resilience and adaptation to climate change.

- To ensure mainstreaming of the disaster risk management into future development programmes in changing climate.

1.1.4 Who Can Use the NDMP-II?

The National Disaster Mitigation Plan will provide strategic direction for those all government and non-government stakeholders

to understand the national, provincial and district level disaster management system and prioritize the needs for implementation to reduce hazard's risk and further develop resilience against disasters and climate change. The plan is specifically useful document for all those relevant authorities, ministries, department, UN, I/NGOs, financial and development institutions and private sectors involve in all three phases of the disaster management cycle.





1.2. Pakistan at a Glance

1.2.1. Geographical Features

LOCATION

Pakistan occupies a geo-political strategic position situated at the crossroads of South Asia, the Middle East, and Central Asia. Geographically, it is located between 23°, 41', 49" to 36°, 54' 23" north latitudes and 60°, 52', 19" to 75°, 22', 50" east longitudes.

BOUNDARY

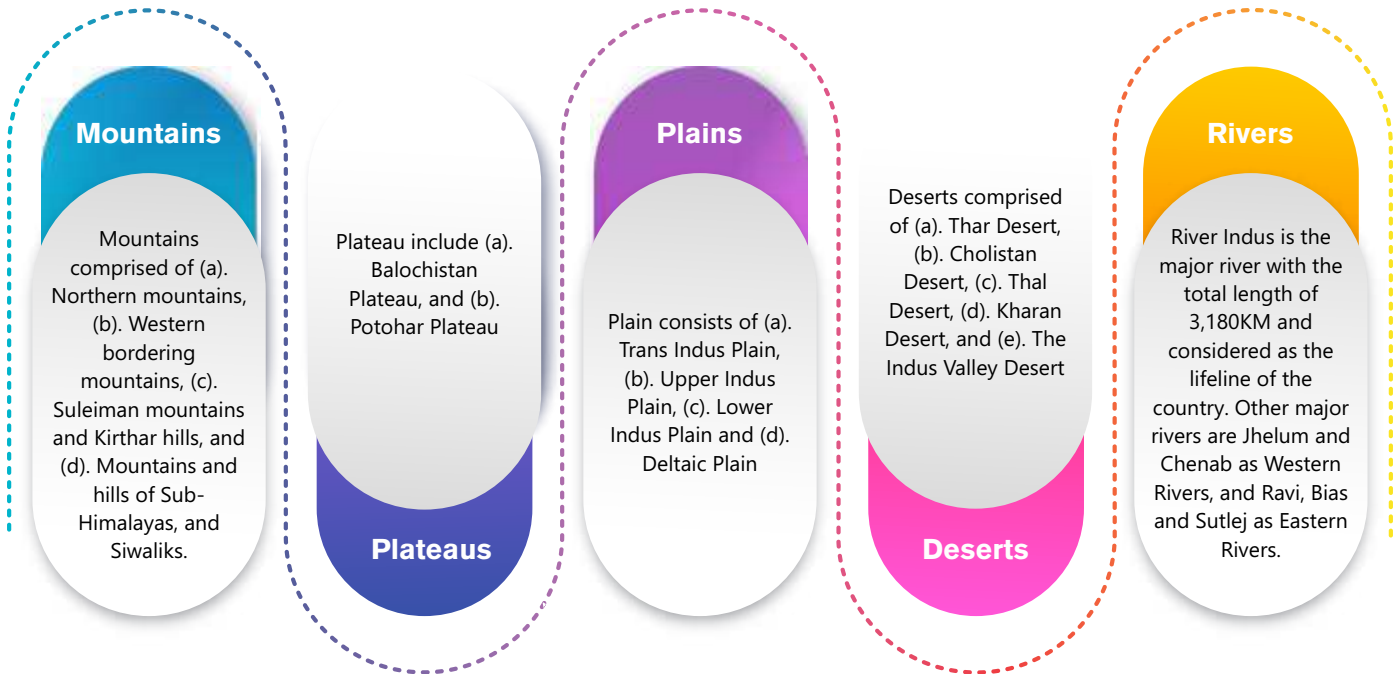
The country shares border with China in the Northeast, Afghanistan in the Northwest & West, Iran in the Southwest, Arabian Sea in the South and India in the East & Southwest. Towards the Northwest, the country is separated narrowly from Tajikistan by Afghanistan's Wakhan Corridor, while also shares a maritime border with Oman.

AREA

The total area of Pakistan is 796,096 Km². Approximately 468,000 Km² in the North and West consists of mountains and plateaus, while the remaining 328,096 Km² comprises of plains and desert areas. The country has around 700 KM long coastline situated in the Province of Sindh and Balochistan.

Pakistan has diverse geographical and physical features comprising of mountains, fertile plains, plateaus and deserts. It consists of the flat Indus plain in the east and the Balochistan plateau in the West. It has one of the World's highest mountain ranges – the Karakoram Range in the North and Northwest part of the country. The World's second highest mountain, the K2, is also

situated in Pakistan, as well as the 62 KM long Baltoro Glacier, which is one of the longest glaciers outside the Earth's Polar Regions. The mighty River Indus is the major river with the total length of 3,180KM and considered as the lifeline of the country. Other major rivers are Jhelum and Chenab as Western Rivers, and Rave, Bias and Sutlej as Eastern Rivers.

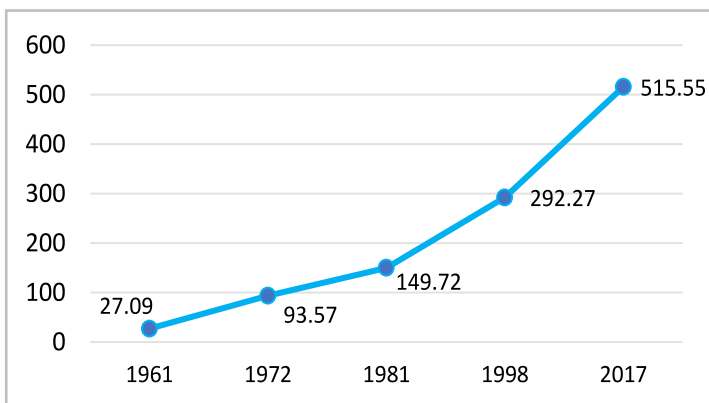


1.2.2 Population Distribution

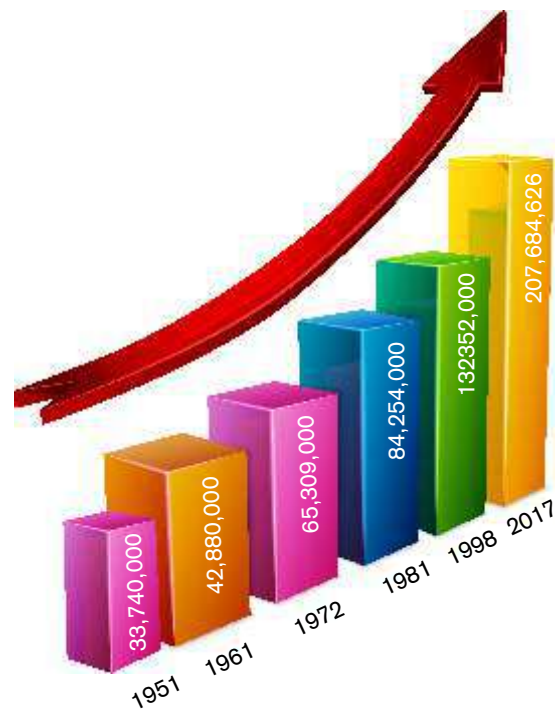
Pakistan with a total population of 207,684,626 people as recorded in Census-2017 has become the fifth-most populous country in the world. The intercensal population shows an increase from 33.74 million in Census-1951 to 207.68 million in 2017, witnessing a population burden of 173.94 million people over the last 67 years.

The figure below shows that Pakistan has been

Cumulative increase in population since 1951-2017 (In %age)



experiencing a rapid increase in population during the last 3-4 decades and thus showing an overall cumulative increase in population of 515.55% since 1951^[3].

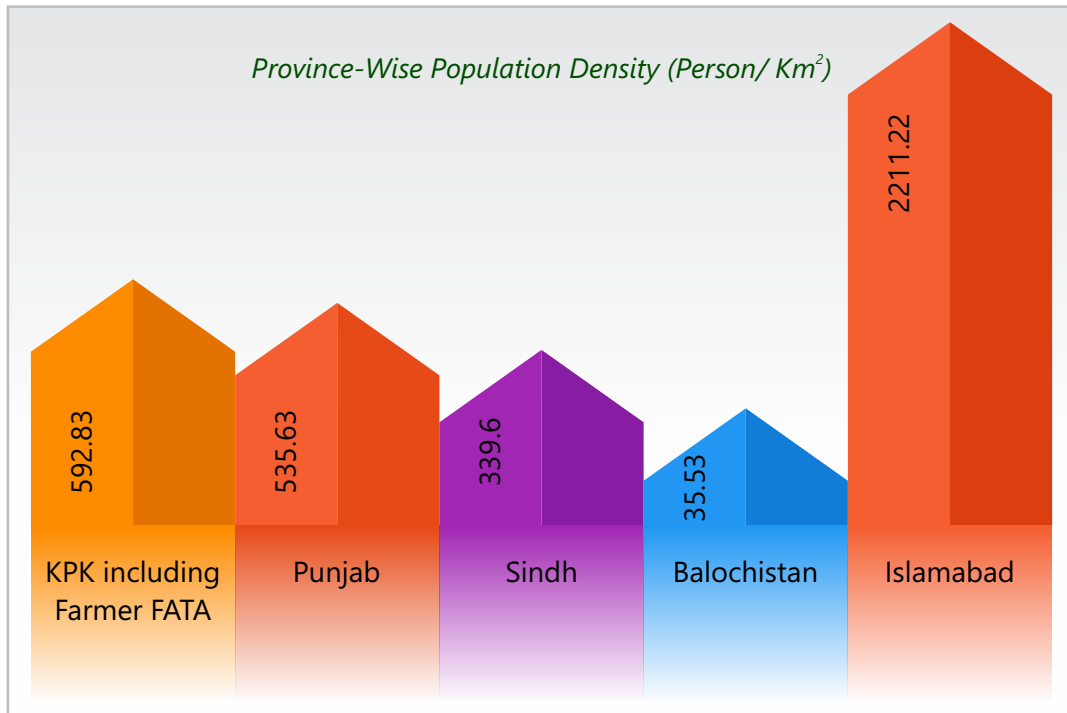


Intercensal Growth of Population of Pakistan



According to Population census report of 2017, the overall populations' density is 260.88 persons/Km². The province-wise population

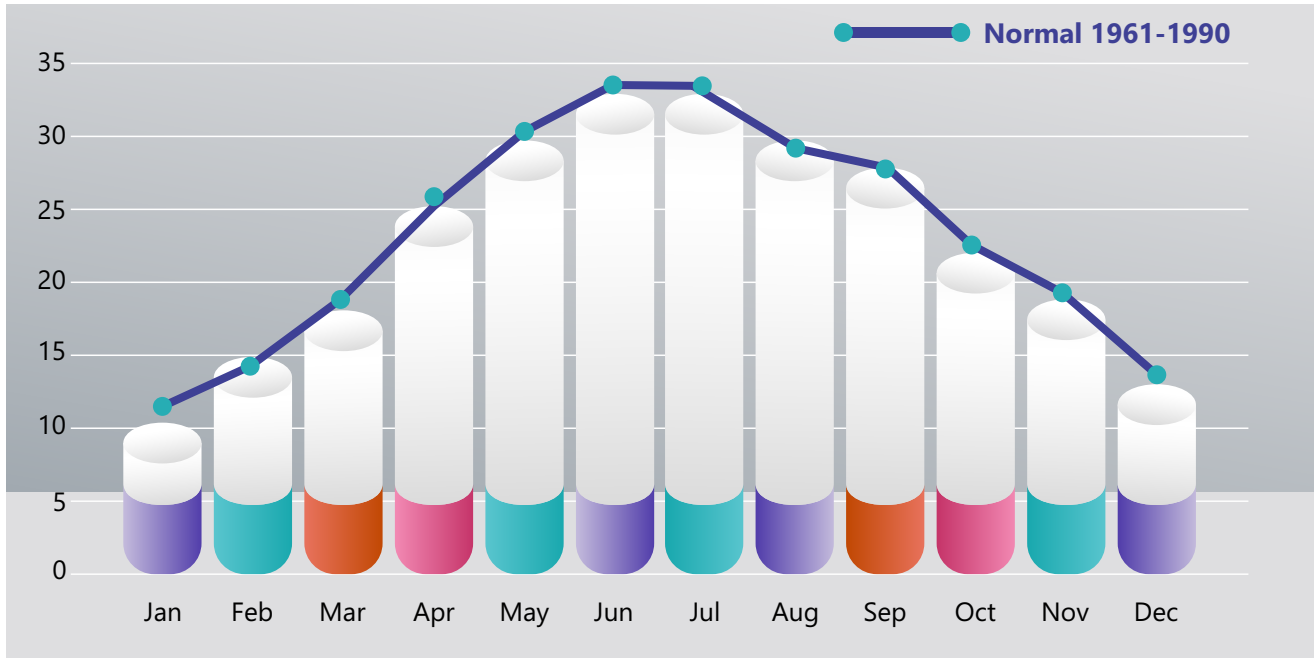
density shows that Islamabad population is increasing at enormous rate.



1.2.3 Climate of Pakistan

Most of Pakistan has generally dry climate and receives less than 297.6mm of rain per year, although the Northern and Southern areas have a noticeable climatic difference. The average annual temperature is around 22.45°C. In the plain areas, the hottest months are June-August, when temperature cross sometime 50°C. However, in the coastal areas of Sindh and Balochistan Provinces, the summers remain

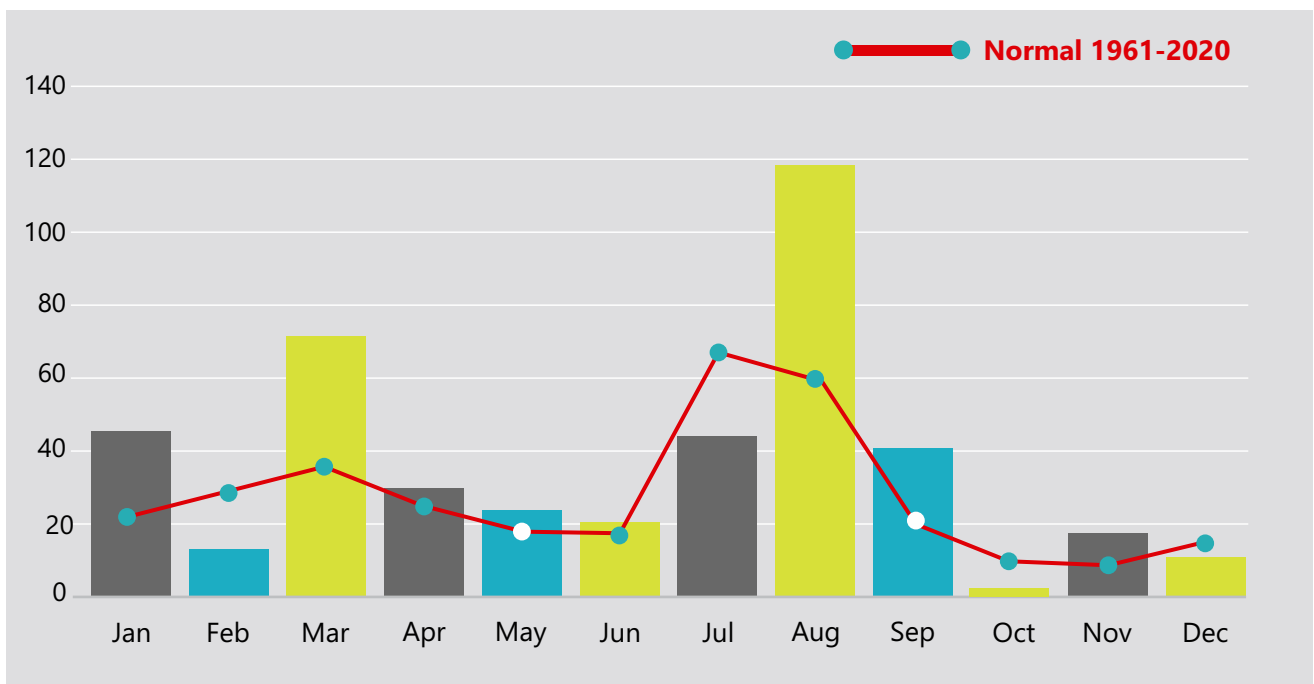
warmer. The winter months are December to January, where the temperatures sometime drop very low in the northern, western and north-western mountains making the northern and western regions the coldest in winter with heavy snowfall i.e., the temperature of Skardu District experiences as low as -6 and -8.7°C in the winter months of December and January. Likewise, Quetta and Ziarat of Balochistan Province, also experience severe winters and snowfall on its mountains.



Monthly Mean Temperature during 2020 Compared with their Corresponding Averages^[4]

The country receives rainfall by the two major sources i.e., the monsoon during summer months and the westerly depression during winter months. However, most of the rainfall

receives from the monsoon season which cause sometime severe flooding in the plain areas of the country.



Monthly Rainfall during 2020 compared with their Corresponding Averages^[4]



1.2.4 Administrative Features

Pakistan is administratively divided into four provinces, namely Khyber Pakhtunkhwa, Punjab, Sindh and Balochistan in addition to Islamabad Capital Territory and the autonomous regions of Azad Jammu and Kashmir and Gilgit Baltistan. Administratively, the country has been further divided into 28 divisions, 129 districts and 526 Tehsils/Talukas, while there are 586 urban areas comprising of some of mega cities.

1.3. Hazard Profile of the Country

The frequent occurrence of natural and human induced disasters during recent years and further the climate change implications highlighted the risk, exposure and vulnerability of general public. Pakistan's exposure to natural hazards could be ranked between moderate to severe. A range of natural hazards including earthquakes, droughts, floods, landslides, avalanches, cyclones, tsunami, glacial lake outbursts floods, and locust infestations prevailing in Pakistan. In addition, a variety of human induced hazards also threaten the society, economy and environment in the country. These hazards include industrial, technological and transport accidents, oil spills, urban fires and civil conflicts etc. The high priority hazards from the perspective of disaster risk reduction include earthquakes, droughts, landslides, flooding and transport accidents that

can cause widespread damage and losses when they occur. These hazards have been turning to disaster of varying magnitudes in the past affecting the lives and livelihood of people. The following is an overview of the key hazards that threaten Pakistan.

1.3.1 Floods

Flood disasters can be classified into five main categories namely Riverine Floods, Flash Floods, Urban Floods, Glacial Lake Outburst Floods and Coastal Floods.

Riverine Floods

The Northern, North-Eastern, Central Punjab and Southern Sindh lie on the track of monsoon winds blowing during the summer season. The onset of the monsoon is anticipated to reach late June or early July and stay at various part of the country till middle of September. This weather pattern causes heavy precipitation followed by the riverine floods in the major rivers of the country. Besides, heavy raining in the catchment areas of the river system, the glacier melting in Northern part of the country generate high flow of water in rivers starting from early May and continue rapid melting during the summer season. The heavy raining accompanied with the glacier melting cause flooding in the plain areas of Khyber Pakhtunkhwa, Punjab and Sindh Provinces.



Pakistan is among first five South Asian Countries with the highest annual average number of people affected by Floods. Flooding is the most recurring natural disaster affecting human lives, and heavy losses to infrastructure and property. Normally tropical monsoon depression systems which originate from the Bay of Bengal during the month from July to September is the main cause of flooding in Pakistan. Flood characteristics can be classified into three main categories namely Riverine Floods, Flash Floods and Urban Floods.



Flash Floods

The flash floods are accompanied with the cloud burst, thunderstorms and torrential rains. These types of floods are frequently occurring in the hilly areas of Districts like Dera Ghazi Khan, Mianwali and Rajanpur in Punjab; Dadu in Sindh and Jaffarabad and Naseerabad in Balochistan and Chitral, D.I.Khan, Kohistan, Swat, Batagram, Mansehra and Abbottabad in Khyber Pakhtunkhwa Provinces.

Urban Floods

Apart from the riverine and flash floods, the urban floods are becoming more common in major cities due to swelling of drains, environmental pollution, unplanned development and poor maintenance etc. The Lai Nullah in Rawalpindi, Malir and Liari Nullahs in Karachi frequently flooded due to heavy rainfall and cause local damages to infrastructure.

Recent Floods from Hill Torrents and Nullahs^[5]

Beyond the riverine system of Pakistan, the country has number of hill torrents that are perennial streams bringing waters whenever there is heavy raining in the hilly areas. In Punjab and Khyber Pakhtunkhwa, these torrents are known as "Rodh Khoie". In Punjab, these hill torrents are 200 in numbers, out of which 13 are major torrents. Whenever heavy raining occurs in the Suleiman Ranges, it suddenly changes into flash floods and badly damage the irrigated lands, crops, houses and public / private infrastructures down in Dera Ghazi Khan, Rajanpur and Mianwali districts. While on one side, the flash floods destroy the infrastructure in Dera Ghazi Khan Canal / Chashma Right Bank Canal command area, on the other side, the barren land in piedmont area (Pachad area) are deprived off water for agriculture. Mostly these torrents dry up suddenly after the rain stops

and their influence is only felt for a few miles below the hills. The torrent water is used for irrigation through a network of diversion and dispersion arrangements by community since centuries. During 2022 floods, the districts of Dadu, Jaffarabad, Naseerabad, D.G.Khan, Rajanpur, Mianwali, D.I.Khan and Tank were seriously affected by the hill torrents floods.

Besides the hill torrents, number of Nullahs are flowing especially in Sialkot, Narowal and Rawalpindi Districts. However, there are many other nullahs across the country that cause localized floodings and cause damages to local communities and infrastructure. Whenever heavy rains occur, the nullah swells up but suddenly disappear causing localized damages to standing crops, trees, homes and other infrastructures etc. Some of Nullahs include Palkhu, Deg, Aik, Basantar, Bein etc. are flowing in District Sialkot and Narowal, while the famous Lai Nullah is flowing inside Rawalpindi city, causing frequent damages to infrastructure due to heavy encroachment along the Lai Nullah.

Coastal Floods

Coastal floods is a result of seawater inundating dry and low-lying land along the coast. The severity and extent of the flooding depend on several factors, including the elevation of floodwater, the topography of the land, and the paths through which the seawater can penetrate inland. Although flood damage modeling has traditionally been done at national scales, but with the increase in intensity and frequency of flood events due to climate change and population growth, there is a growing need for global approaches to flood management.

During recent years, the impact of climatic changes have tremendously increased the frequency and intensity of extreme weather events, including storms and sea level rise, which will further exacerbate coastal flooding.



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This will have severe consequences for the people who live in coastal regions of Gwadar, and the Lasbella in Balochistan, and Karachi, Thatta, Badin, and the Sujawal districts of Sindh

Province. Therefore, it is crucial to develop effective strategies to manage coastal flooding and mitigate its impacts.

Major Flood Disasters in Pakistan

Year	Deaths	Villages Affected (numbers)	Year	Deaths	Villages Affected (numbers)
2022	1730	33 million people	2005	59	1,931
2020	409	1,193,353 people	2004	85	47
2015	238	4634	2003	484	4,376
2014	367	3,100	2001	219	50
2013	243	8,297	1995	591	6,582
2012	571	14,159	1992	1,008	13,208
2011	520	38,700	1988	508	1,000
2010	1985	17,553	1978	393	9,199
2009	99	89	1976	425	18,390
2008	157	8,00	1976	474	9,719
2007	586	6,498	1957	83	4,498
2006	541	2,477	1956	160	11,609
			1950	2,190	10,000

Glacial Lake Outburst Floods (GLOF)

The bursting of glacial lakes in the upstream reaches of the Indus River basin, a phenomenon termed GLOF is one of the natural disasters in Pakistan. In particular, the Karakorum region is noted for the distractive 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. In the case of GLOF, slides, and debris torrents are large enough to dam rivers.

Due to climate change effects, the frequency and persistence of heatwaves in glaciated areas have also increased. Due to these reasons, the melting rate of glaciers has increased causing glacier retreat where as some studies suggest that more than 35 glaciers of Karakorum Range are advancing with 11 exceptional surges. The changing behavior of glaciers has caused the

formation of new lakes and extension in the volume and size of pre-existing lakes. Thus, the probability of sudden discharge of water from these lakes generally known as Glacial Lake Outburst Flood (GLOF) has increased.

During the past 200 year's history, the Gilgit-Baltistan region has observed almost 35 destructive GLOF events. According to the available records, five GLOF events have occurred during the year (2008-2009) in Gojal valley of Hunza. In 2008, a lake at the Gulkin glacier in Upper Hunza burst three times in the span of two months, flooded the village community nearby, and destroyed around 50 houses. The Korambar Glacier near Iskhoman Valley and the Buni Gole Glacier near Chitral generated GLOFs in 2010 and 2012, causing damages to agricultural land and human settlements on each occasion[14].



A total of 5,218 glaciers covering an area of about 15041 km² have been identified having 2738 km² of ice reserves in ten river basins of the Hindu Kush-Himalaya (HKH) region of Pakistan. Similarly, 2,420 glacial lakes have been also identified. About two third of these lakes are found in Gilgit, Indus, Swat, and Shino River

basins. Among total glacial lakes, 1,328 have been characterized as major lakes having an area of more than 0.02 km². Out of these major lakes, 52 are identified as potentially dangerous lakes. Most of these potentially dangerous lakes are located in Indus, Astore, and Gilgit river basins.

List of Vulnerable Districts to Flood Hazard

Province	Districts
Balochistan	Bolan, Chaghai, Gwadar, Jaffarabad, Jhal Magsi, Kech, Kharan, Khuzdar, Lasbela, Nasirabad, Nushki and Sibi
Khyber Pakhtunkhwa	Buner, Charsadda, Nowshera, Swat, Chitral, D.I.Khan, Dir Upper, Dir Lower, Kohistan, Kurram, Lakki, Marwat, Malakand, Mansehra, Mardan, North Waziristan, Nowshera, Orakzai, Peshawar, Shangla, South Waziristan, Swabi, Swat and Tank
Punjab	Bhakkar, D.G.Khan, Gujranwala, Gujrat, Jhang, Khushab, Layyah, Mianwali, Muzaffargarh, Narowal, R Y Khan, Ranjanpur, Rawalpindi, Sialkot and Sheikhpura
Sindh	Badin, Dadu, Ghotki, Jacobabad, Thatta, Mirpur Khas, Jamshoro, Kamber, Karachi, Kashmore, Khairpur, Larkana, Sanghar, Shahdadkot, Shikarpur, Sukkur, T.M.Khan & Thatta
AJ&K	Bagh, Bhimber, Muzaffarabad, Neelum, and Poonch
Gilgit-Baltistan	Astore, Chilas, Diamer, Ghanche, Gilgit, Ghizer, Hunza, Nagar and Skardu

1.3.2. Drought



Pakistan has a long latitudinal extent with very high the rainfall variability which makes droughts an intermittent phenomenon in the country. Drought differs from others natural disasters in effects which 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 "Creeping hazard". The impacts of drought are less obvious and are spread over larger geographical areas^[6].



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During recent years, droughts are reported to have drought extensive damages in Balochistan, Sindh and Southern Punjab where average annual rainfall is as low as 200-250mm. The Punjab province experienced the worst droughts in 1899, 1920 and 1935. The Khyber Pakhtunkhwa Province experienced the worst

droughts in 1902 and 1951, while Sindh had its worst droughts in 1871, 1881, 1899, 1931, 1947 and 1999. The most severe drought at the national scale occurred in 1998-2001, which had serious adverse impacts that have been described further on.

Major Drought Disaster in Pakistan

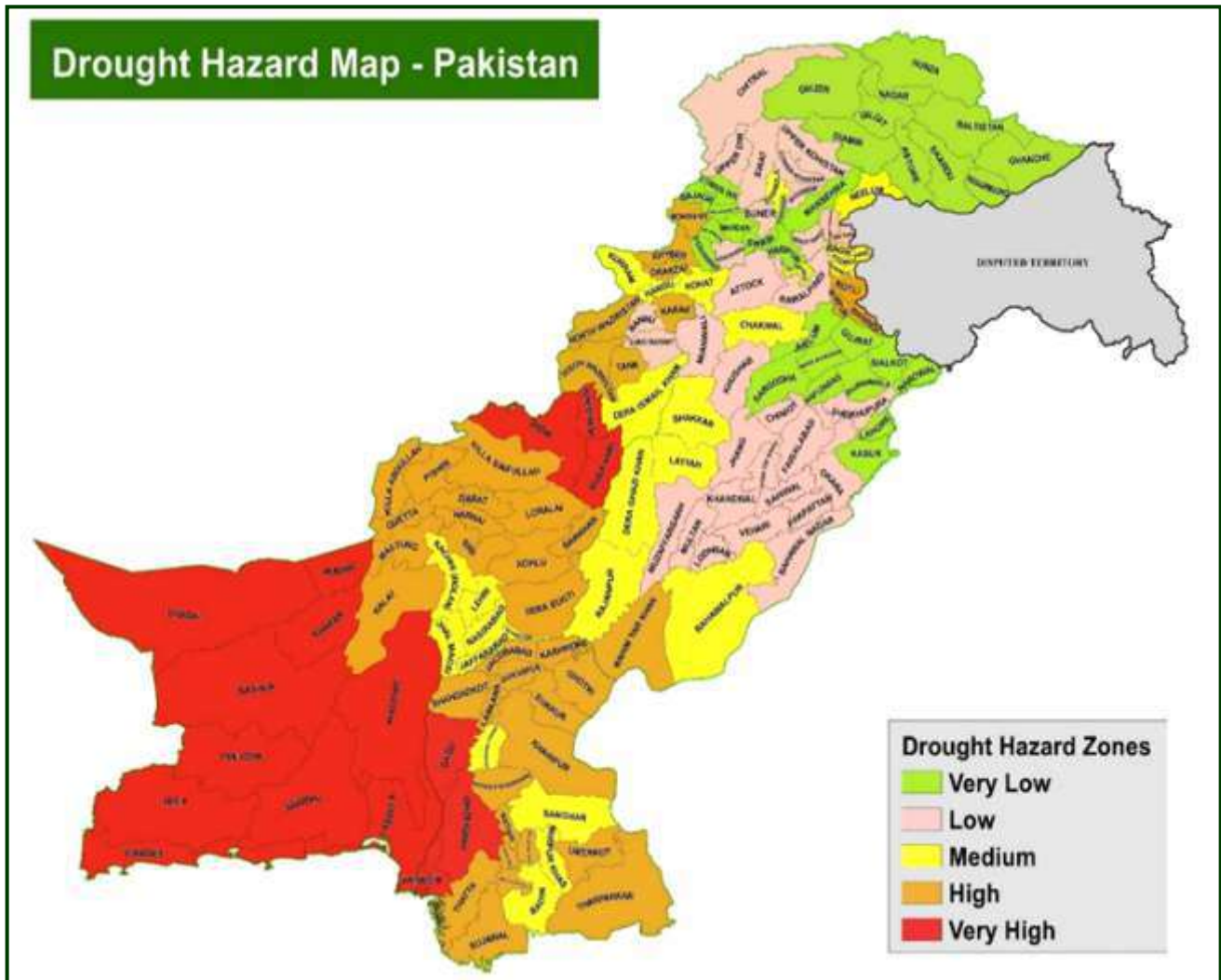
Year	Deaths	Number of Affects	District Affected
1997-2002	145	3.3 million	23

List of Vulnerable Districts to Drought Hazard

Province	Districts
Balochistan	Severe - Awaran, Gawader, Kech, Kharan, Nushki, Panjgur and Washuk Moderate - Chaghi, Killah Abdullah and Pishin
Khyber Pakhtunkhwa	Chitral
Punjab	Severe - Bahawalnagar, Bahawalpur, Bhakkar, Dera Ghazi Khan, Muzaffargarh, Rajanpur and Rahim Yar Khan Moderate - Attock, Chakwal, Jhelum, Khushab, Layyah and Mianwali
Sindh	Severe -Dadu, Jamshoro, kambar-Shahdad Kot, Tharparkar and Umerkot Moderate - Badin, Benazirabad, Karachi, Khairpur, Mirpurkhas and Thatta



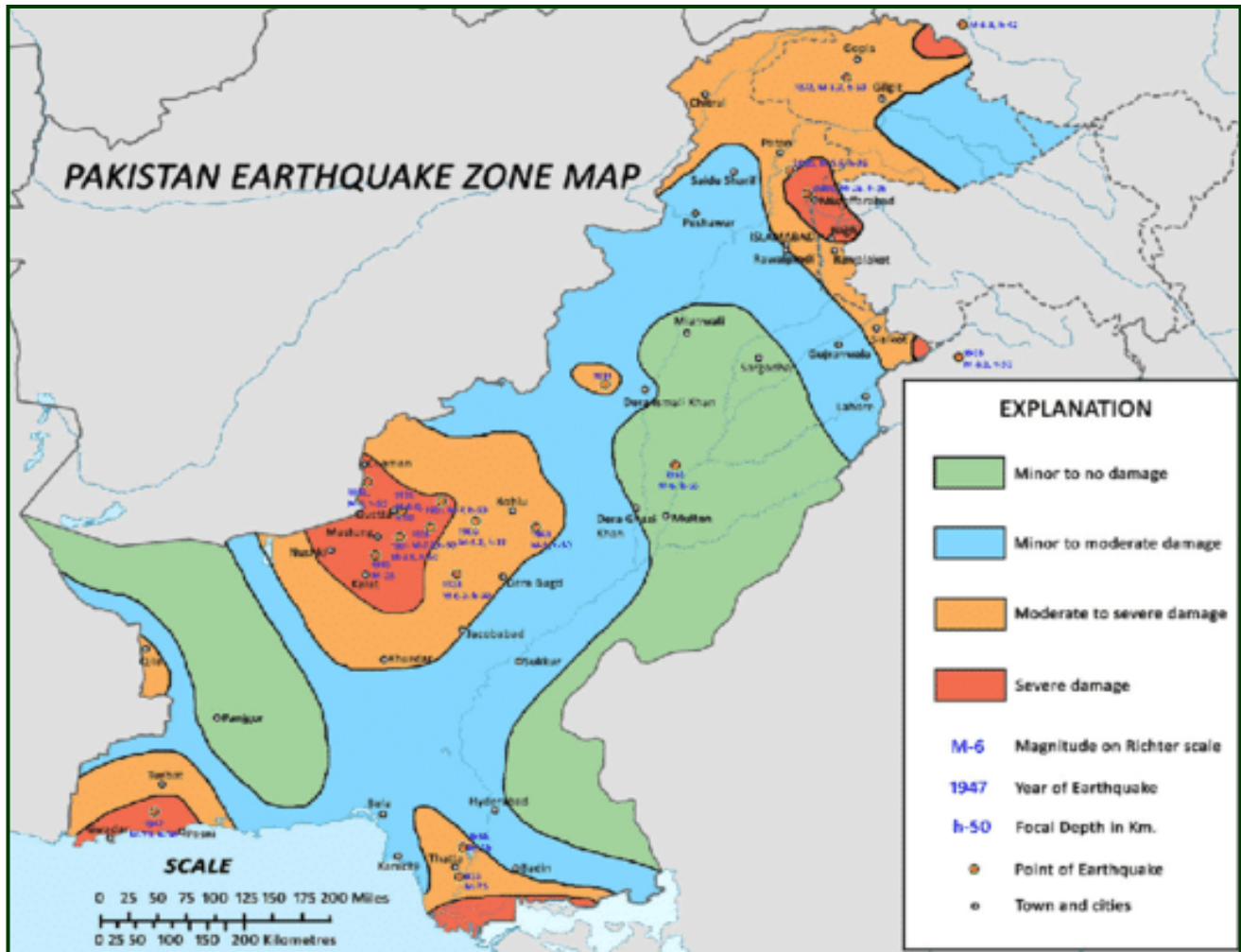
Distribution of Drought Prone Districts in Pakistan



1.3.3. Earthquake



Pakistan lies in a seismic belt along the Himalayas, Karakorum and partly Hindu Kush ranges in the north; Suleiman range in the west with Chaman fault line along Quetta, and Makran fault line along the seacoast. Many earthquakes have struck the area constituting Pakistan in the previous and present century as can be seen in the following map. Earthquakes normally occur along the Himalayas, Karakoram and partly Hindu Kush ranges in the north Koh-e-Suleiman range, in the west with Chaman fault line along Quetta and Makran fault line along the coast. In 1935, an earthquake of above 6.5 on Richter scale rocked Quetta leaving 35,000 people dead.



Seismic Zonation of Pakistan

Over the period from 1974 to 1999 approximately 5669 people were killed due to earthquake in the Gilgit Baltistan, Khyber Pakhtunkhwa and Balochistan. The earthquake

of 8 October 2005 was the worst natural disaster that the nation has experienced in the recent history leaving behind around 78,000 people dead.

Major Earthquake Disasters in Pakistan

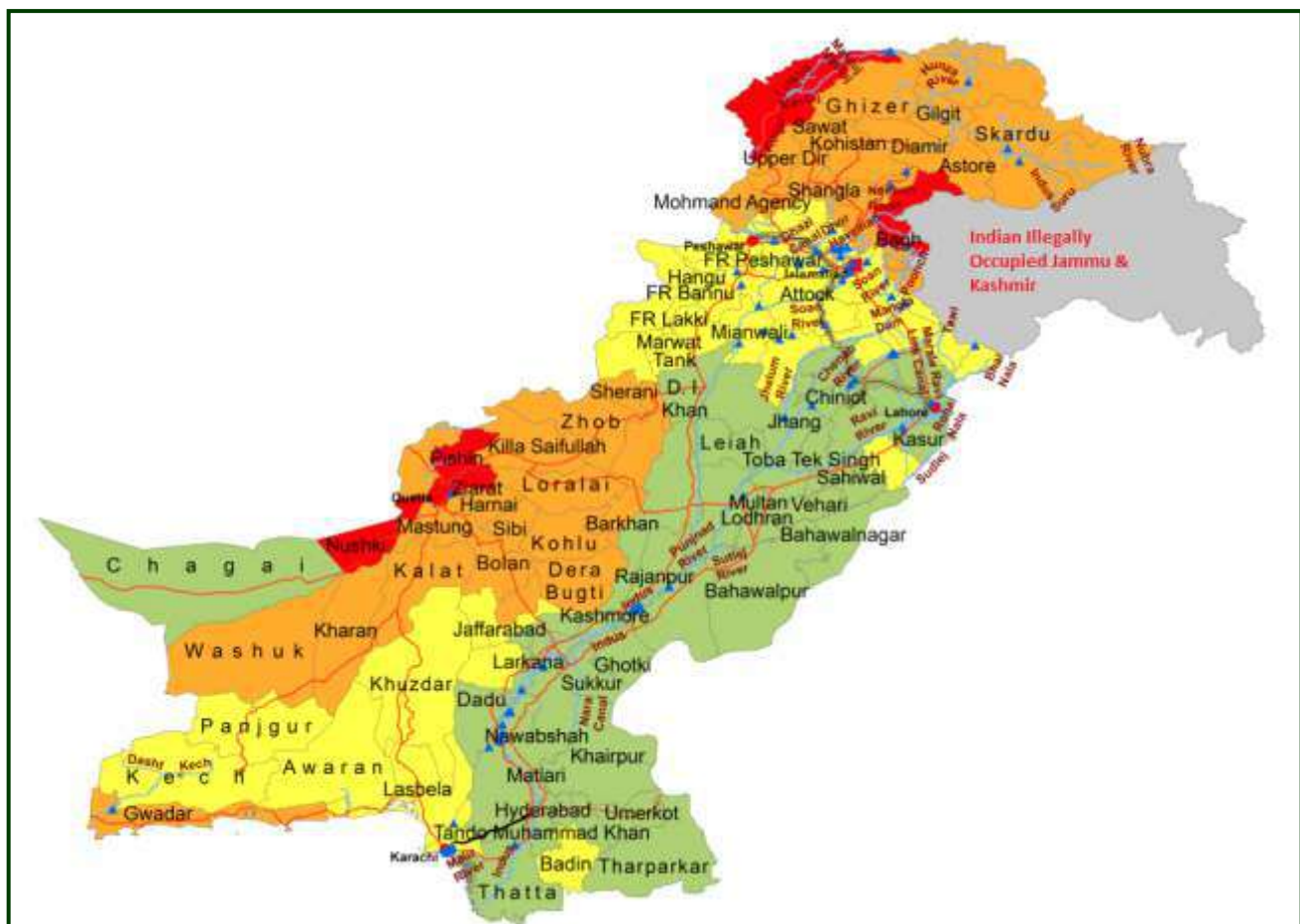
Year	Location	Magnitude	Deaths	Losses
Oct 2015	KP, Punjab, AJ&K and G-B	8.1	280	98,069 houses & 479 schools
Sep 2013	Awaran	7.7	376	6,842 houses
Oct 2008	Ziarat	6.4	160	5,943 houses
Oct 2005	KP & AJK	7.6	73,338	208,091 houses
Dec 1974	Northern Area	7.4	5,300	4,400 houses
Nov 1945	Makran Coast	8.3	4,000	-
May 1835	Quetta	7.7	60,000	-

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List of Vulnerable Districts to Earthquake Hazard

Province	Districts
Balochistan	Quetta, Khuzdar, Kalat, Gwadar, Ziarat, Pishin, and Noshki
Khyber Pakhtunkhwa	Abbottabad, Bajaur, Bannu, Chitral, Dir Lower, Malakand, Mardan, Peshawar, Swat, Shangla and Swabi
Punjab	Gujrat, Narowal, Okara, Rawalpindi and Sialkot
Sindh	Karachi
Azad Jammu & Kashmir	Bagh, Hattian, Haveli, Kotli, Muzaffarabad, Poonch and Sudhnoti
Gilgit-Baltistan	Astore, Diamer, Gilgit and Ghanche



Distribution of Earthquake Prone Districts in Pakistan



1.3.4. Tsunami



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. However, all of the earthquakes cannot generate Tsunamis.

A major tsunami was experienced on 28 November 1945, due to a great earthquake of magnitude 8.3, offshore Makran Coast south of Pasni during the early hours. The tsunami produced sea waves of 12-15 meters height that killed at least 4000 people in Pasni and adjoining areas. The tsunami waves reached as far as Mumbai in India. Karachi, about 450 kms from the epicentre, experienced 6 feet high sea waves which affected the harbour facilities. Fortunately, when the sea wave occurred it was not the time of high tide at Karachi coast. The risk of the occurrence of a future tsunami from

this source region exists. The fact that cities like Karachi lie close to the potential epicentres for large submarine earthquakes, demands attention for enhancement of local capacities for disaster risk reduction, early warning and response in order to reduce losses to life, property and environment from future earthquake or tsunami events. Tsunami may reach the coastal region within one hour. Thus, there is a need to put in place a warning system that would ensure that the warning message reaches the coastal inhabitants as soon as possible.

Major Tsunami Disasters in Pakistan

Date	Time	Magnitude	Run up (In meter)	Location
28 Nov 1945	21:56:40	8.3	15.24	Karachi, Gwadar, Ormara, & Pasni
27 Aug 1883	02:59	Volcano	0.50	Karachi

List of Vulnerable Districts to Tsunami Hazard

Province	Districts
Balochistan	Gwadar and Lasbela
Sindh	Badin, Karachi, Sujawal and Thatta



1.3.5. Landslide



Pakistan is at considerable risk to landslide hazard. Landslides can occur on any terrain having the right conditions of soil, moisture, and the angle of slope. They can be triggered by rains, floods, earthquakes, and by other natural as well as human-induced causes, such as grading, terrain cutting and filling, excessive development, etc. Major landslides have triggered in the aftermath of the 1972, 2005 and 2010 earthquakes in Northern Pakistan. The cracks and unstable earth resulting from the earthquakes may cause massive landslides and loss of life and agricultural land in the event of heavy or extended rains. Some of these have posed major threat to the lives and livelihoods of a large population.

In particular, the Northern region of Pakistan (Gilgit-Baltistan, Azad Jammu & Kashmir and Khyber Pakhtunkhwa) are vulnerable to

landslides because of their steep hilly mountainous topography.

Major Landslide Disasters in Pakistan

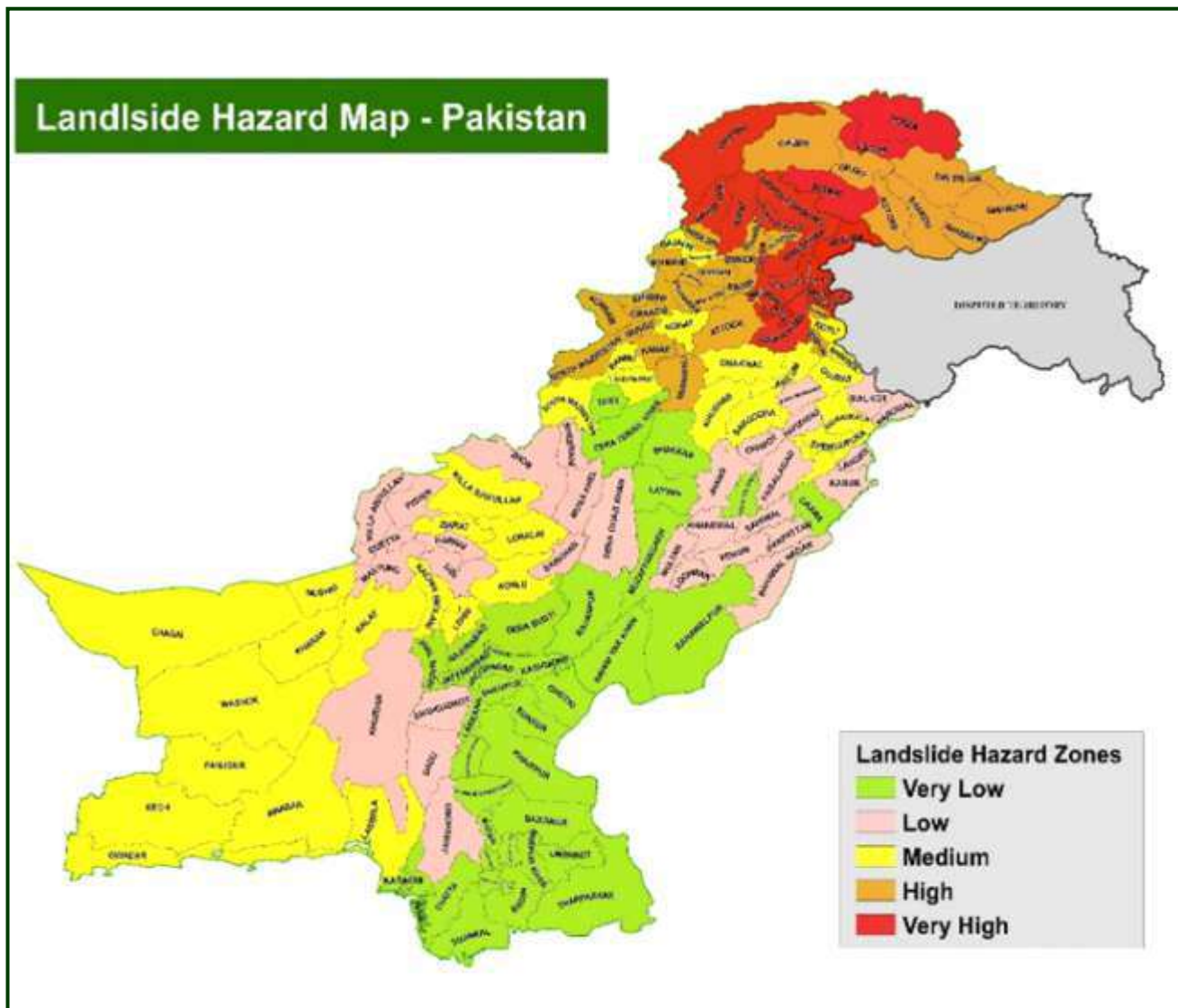
Year	Areas of landslide activity	Remarks
1982	Murree-Muzaffarabad Road and Ghari Habib Ullah Road	During Moderate Rains
1983	Murree-Kohala Road and Karakorum Highway	After Heavy Rains
1984	Hunza Valley, Karakorum Highway	Dry Season
1985	Murree-Kohala-Muzaffarabad Road and Karakorum Highway	During Monsoon
1987	Karakorum Highway (KKH)	Dry Season
1989	Kohala-Muzaffarabad-Ghari Habib Ullah Road and Karakorum Highway (Hunza Valley)	During Monsoon
1990	Hunza Valley and Batgram-Thakot Road (KKH)	Dry Season
1991	Various Section of KKH and Murree-Kohala Road	During Heavy Rains
1992	Abbottabad-Nathiagali, Lowargali and Kohala Road	Brief Rains
2005	Several Thousand Landslides or Rock Falls and Debris Falls in Muzaffarabad, Neelum Valley, Lamnian Valley, Balakot and Kaghan Valley	Earthquake and Heavy Rains
2010	Formed Atta Abad Lake by Damming Hunza River, Blocked KKH.	Flood
2011	Village in Gilgit-Baltistan Hit by Mud Flood on 30 July 2011, 129 Households Completely Destroyed.	Flood, Landslide



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List of Vulnerable Districts to Landslide Hazard

Province	Districts
Khyber Pakhtunkhwa	Swat, Chitral, Upper Dir, Abbottabad, Mansehra, Batagram & Kohistan
Gilgit-Baltistan	Astore, Gilgit, Diamer, Ghizer, Skardu, Ghanche and Shigar
Azad Jammu & Kashmir	Muzaffarabad, Rawalakot, Bagh, Neelum and Poonch
Punjab	Murree



Distribution of Landslide Prone Districts in Pakistan



1.3.6. Smog



During the month of December, the thick fog descends upon the major cities of Punjab blocking out the winter sunshine especially in the morning time. According to the air quality index especially for the month of December, the Lahore normally placed among the top three worst cities affected by the smog^[7].

The smog is caused primarily by the emission from vehicles and industries, excessive waste production and rubbish incineration, dust from the surrounding deserts, excessive consumptions of fuel due to high population and cold winters, burning in the agricultural fields and smoke emitting from the brick kilns in the surrounding of Lahore city^[8]. The problem has grown worse over the last few years during the month of December and January. As a

result, it causes hazy air that makes breathing difficult and resultant severe disruption to human activities, causing highway and road accidents, flight disruptions, health issues and compel people to stay at home especially in the morning time. Moreover, excessive pollution has made the atmosphere suffocating even indoors, putting rather housewives and children at huge risk of getting eye, skin, lungs, ear, nose and throat complications.

List of Vulnerable Districts to Smog Hazard

Province	Districts
Punjab	Lahore, Faisalabad, Sheikhpura, Nankana Sahib, Kasur, Gujrat, Narowal, Sialkot are vulnerable to smog hazards during winter season.

1.3.7. Avalanche



Gilgit-Baltistan, Azad Jammu & Kashmir regions and northern parts of Khyber Pakhtunkhwa experience snow avalanches on seasonal basis. Local communities surrounding the avalanche prone 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 regular basis. Therefore, the impact of avalanches is area minimal.

A study conducted by WAPDA in 1985-1989 under the Snow and Ice Hydrology Project, identified the potential avalanche paths. The Siachen-Kariyan avalanche is normally called glacier surge, a new phenomenon caused either

by rise in temperature or some tectonic movement, where glacier advances move at velocities up to 100 times faster than normal avalanche. Due to heavy precipitation in the late winter, the Northern areas of Pakistan i.e.,



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Kaghan valley, district Nagar, Ghizer and Skardu of Gilgit-Baltistan are prone to snow avalanches. On 9th April 2012, a deadly avalanche engulfed Pakistan army headquarters near the Siachen Glacier in the eastern Karakoram Range in

Himalaya. The tragedy occurred at an altitude of 15,000 feet, the avalanche has left snow up to 25 meters. Around 130 soldiers have been buried due to the incident.^[9]

List of Vulnerable Districts to Avalanche Hazard

Province	Districts
Khyber Pakhtunkhwa	Chitral and Upper Kohistan
Azad Jammu & Kashmir	Neelum and Hattian Bala
Gilgit-Baltistan	Astore, Gilgit, Ghanche, Ghizer and Skardu

1.3.8. Heatwave



During recent years, the heatwave phenomenon is becoming potential threats especially to urban areas like Karachi, Hyderabad, Sukkur and other cities where the excessively high temperatures and humidity last for several days with no or less blow of winds.

Karachi has suffered from a severe heat wave during 2014 and 2015. In June 2015 Karachi City experienced a severe heat wave that caused over 1,200 deaths, while 65,000 were affected and 1,200 cases of heat illness were recorded^[10]. The temperature recorded during those days' ranges in between 40 to 49oC. The heat wave phenomenon is becoming more common with climate change, global warming and environmental pollution and hence Karachi will be more at high risk during hot summer season where more than 16 million people are residing.

Some of research studies suggests that housing quality and type, population size, low-income levels and a lack of education are factors likely to have increased heat vulnerability in Karachi, at least in June 2015 heat wave threat. Therefore, the dwellers of Karachi would require the provision of more shaded communal spaces using greenery and future urban design. In such situations, water and fans should also be made available to the most vulnerable such as the elderly people, sick and children^[11].



1.3.9. Cyclone



Although the Cyclones occur in Pakistan occasionally, still the intensity, magnitude and tack change have been observed more severe during recent years due to climate change and global warming of the surrounding sea. On average, the cyclone happens about two times a year. The typical cyclone season depends on the summer monsoon. In the months before (May to June) and after (October to November).

The weather system passed through four stages before it matured into a cyclone; the system first developed into a low-pressure area, then a well-marked low-pressure area followed by depression and deep depression before a cyclone was born and named.

Cyclones have caused large scale damage to the coastal area of Pakistan. The costal belt of

Pakistan, especially Sindh is highly vulnerable to tropical cyclones associated with storm surges.

Major Cyclone Disasters in Pakistan

Year	Death	No affected	Districts Affected
2010	15	0.2 million	Balochistan-30 and Sindh-3
2007	Balochistan-380 and Sindh-250	1.5 million	Balochistan-10 and Sindh-4
1999	202	0.6 million	Thatta and Badin

List of Vulnerable Districts to Cyclone Hazard

Province	Districts
Balochistan	Awaran, Gwadar, Ketch and Lasbela
Sindh	Badin, Karachi, Sujawal and Thatta

1.3.10 Snowstorm/Blizzards



Snowstorm or Blizzard is a type of precipitation that falls on the earth in the form of snow. It is more commonly occurring during the month of winter season specifically during December and January in Pakistan, where mostly the precipitation occurs in the form of snow within the clouds because temperatures at the top of the storm are cold enough to make snowflakes. When the snowflakes are accompanied by strong gusts of wind and accumulation of lots of snow, the snowstorm or blizzard happened. It lasts for few hours and often leads to the accumulation of lots of snow, either as new snowfall or as redistribution of previously fallen snow as blowing snow.

Although in Northern part of the country, this phenomenon is commonly occurring, but due to low or no population in upper part of the country, the effects might not have observed so severely. However, the snowstorm occurred on 7th January 2022 bring huge devastation in Murree hill station of Rawalpindi district, where a painful incidence happened when substantial number of local tourists trapped due to severe snowstorm at night. Despite of the Pakistan Meteorological Department warning issued on 5th January about the expected snowstorm in Murree and Galiyat areas, the tourist snubbed the warning and rush to travel with their families to enjoy the snowfall. It was estimated that around 150,000 vehicles entered Murree during

the intervening night of 4 to 8 January^[12]. As a result, the cars were packed bumper-to-bumper on the roads in the surrounding of Murree town. All routes into and out of Murree were totally blocked, leaving the tourists stranded. When it began to snow heavily, lot of people left their cars on the roads to seek shelter in hotels. In some places, the heavy snowfall and strong winds caused fall of trees thus further block roads. As a result of which at least 22 tourists lost their precious lives. The victims suffered from hypothermia while some may have died of carbon monoxide inhalation because their exhaust pipes were blocked by snow, which resulted in leakage of carbon monoxide into the cars, causing the deaths.



Snowstorm in Surroundings of Murree During January 2022



1.3.11. Locust Infestation



The Locust is one of about a dozen species of short-horned grasshoppers that are known to change their behavior and form swarms of adults or bands of hoppers. The swarms that form can be dense and highly mobile. The arid areas of Balochistan and Punjab are becoming ideal breeding habitats for locusts due to which these provinces always remained under threat of Locust attack. It is a transboundary pest that traveled freely in large parts of Africa and Asian countries where it attacks nearly all crops and rangeland vegetation.

In Pakistan, the history of Locust attack revealed that during the last \approx 100 years, the country remained under the grip of desert Locust invasions in 1926, 1952, 1962, and 1992. These swarms injured to all crops and rangeland vegetation with compounded adverse effects in the form of 2 to 3 years of drought and an overall longer-term condition of dwindling water availability.

Baluchistan, 25% in Sindh and 15% in Punjab) are breeding grounds for the Desert Locust, whereas the entire country is under the threat of invasion if the Desert Locust is not contained in the breeding regions^[13]. During 2019-20, severe locust attack badly damaged the cropped area and fruit orchards in 54 districts of the country, including 31 districts of Balochistan, 08 of Khyber Pakhtunkhwa, 10 of Punjab and 05 districts of Sindh.

In Pakistan, 38% of the area of Pakistan (60% in

Province	Districts
Balochistan	Chaghai, Kharan, Panjgur, Khuzadar, Awaran, Pishin, Barkan, Harani, Kohlu, Washuk, Gwadar, Ketch and Lasbela
Sindh	Badin, Sukkur, Khairpur, Shaheed Benazir Abad, Sanghar, Tharparker, and Ghotki
Punjab	Rahim Yar Khan, Bawhawalpur, Bahwalnagar, Bhakkar, Khushab, Rajinpur, and Muzaffargarh
Khyber Pakhtunkhwa	Dera Ismail Khan, Bannur, Lakki, Orakzai, Kurram and Tank

1.3.12. Dengue Fever



During recent years, the dengue virus is becoming common specifically during summer seasons in urban areas of Pakistan. The frequency of dengue specifically is more common in Punjab Province.





The first confirmed outbreak of dengue fever in the province was recorded in 1994, since then it arises time to time especially at the start or end of the summer season in different part of the country specifically, Lahore and Rawalpindi mostly remain under the grip of this disease. During 2010, Pakistan has experienced an epidemic of dengue fever that has caused 16,580 confirmed cases and 257 deaths in Lahore and nearly 5000 cases and 60 deaths

reported from the rest of the country^[15].

The three provinces facing the dengue are Khyber Pakhtunkhwa, Punjab and Sindh. Until October 2019, more than 19000 cases of dengue infection and 30 deaths had been reported by the National Institute of Health, Pakistan, in 2019 while during 1995 to 2019, there were around 147,200 cases of dengue infection and over 800 deaths.

1.3.13 COVID-19



Since December 2019, the entire world including Pakistan have been remained in the grip of Coronavirus Disease (COVID-19). The effects of COVID have already been visibly felt in the form of four waves in Pakistan whereas the entire provinces witnessed serious impact on lives and seriously shattered the economic activities of the country. COVID-19 was first reported in Wuhan, China in December 2019, and soon became serious public health threat for more than 213 countries across the globe.

As of 13th January 2023, the National toll of confirmed COVID-19 cases surpassed 1,575,991

including 30,639 deaths.

Table 3.15: Impact of COVID-19 As on 24 April 2022^[16]

Confirmed Cases	Deaths	Vaccine Doses Provided
1,575,991	30,639	317,696,373

1.3.14. Industrial and Technological Hazards

This includes industrial incidents, Oil, Spills, Chemical, Biological, Radiological and Nuclear incidents. Industrial cities like Karachi, Hyderabad, Lahore, Faisalabad, Gujrat, Gujranwala and Sialkot are prone to industrial disasters. The chemical industry faces the potential threat of disaster because of possible explosions Pakistan ports are at risk from

marine accidents. In July 2003, in Karachi, the wreckage of Tsunami Spirit, an old Greek Ship caused colossal environmental losses and health hazards for the businesses, port worker and adjacent communities. About 28,000 tons of oil spilled all over the harbor area, which adversely affected marine life. The residents in the area reported headaches, nausea and respiratory problem in the weeks following the accident. It took month for the authorities to clear the oil affected areas.



1.3.15. Fires

There has been a significant migration from rural to urban areas during last two decades, which has put a lot of pressure on the urban areas of Pakistan thereby creating more slum areas in the cities. In addition, there is a lot of contraction activities taking place without following/ abiding by the building codes. Over and above, mushrooming of unauthorized LPG Stores are quite common. The sale of petroleum products in the residential areas is also widespread in the cities. These practices pose major Fire Risk in Urban Areas. While the risk of fire exists in all dwelling, the cities with more industrial units, CNG stations/petrol Pumps, godowns are comparatively more fire prone.

Moreover, Pakistan has different types of forests, ranging from Mangroves in the south to

Alpine vegetation in the north. Out of all these types, sub-tropical broad leave ever green scrub forest and sub-tropical (Chir) pine are the most fire prone Forests.

1.3.16. Transport Accidents

Transport accidents includes both land and Air accidents. Road accidents, are common in Pakistan. The major reasons for this are poor road conditions, single road tracks, and unsafe driving practices. In 2017, a tanker truck exploded in Bahawalpur District, killing 219 people and injuring at least 34 others. Besides, railway accidents are also common and caused heavy deaths to passengers. During recent years, the sad air crash incidences of Air Blue and Bhoja in Islamabad, and PIA crash in Karachi and Havellian were among the prominent air accidents causing huge losses.

Traffic Accidents in Pakistan During 2019-2020⁽¹⁷⁾

Total Number of Accidents	Accidents		Persons		Total Number of Vehicles Involved
	Fatal	Non-Fatal	Killed	Injured	
9,701	4,403	5,298	5,436	12,317	12,894

1.4. Factors Contributing to Vulnerabilities

The above overview of disasters reveal that the country is vulnerable to various hazards that can cause serious threats to human lives and properties especially those communities are more exposed that are living along the earthquake faults, landslides, major rivers, and hill torrents as these districts are more at risk of frequent hazards. On top of that, the affected district administrations do not have enough capacities to fight against the high-level flood and earthquake disasters, while the climate change impacts are further compounding the problems to rural communities. Below are some of the major root causes that are putting dynamic pressures in increasing the

vulnerabilities of people in the country:

1.4.1. Population Growth

The population of Pakistan has grown by 361% since 1947. According to the Pakistan Bureau of Statistics 2017, the country population is 207,684, 626 (51.19%) persons with male population as 106,318,220 and female stands at 101,344,632 (48.80%). The Density of the Population was recorded as 260.88 persons per/km². Out of total population, 63.6% were living in rural and 36.4% in urban areas.

The growth of population has negatively affected the socio-economic development of the country resultantly most of the population has settled in the areas that are vulnerable to various of hazards like floods, fires, earthquake, cyclones, landslides, avalanches, and epidemics.

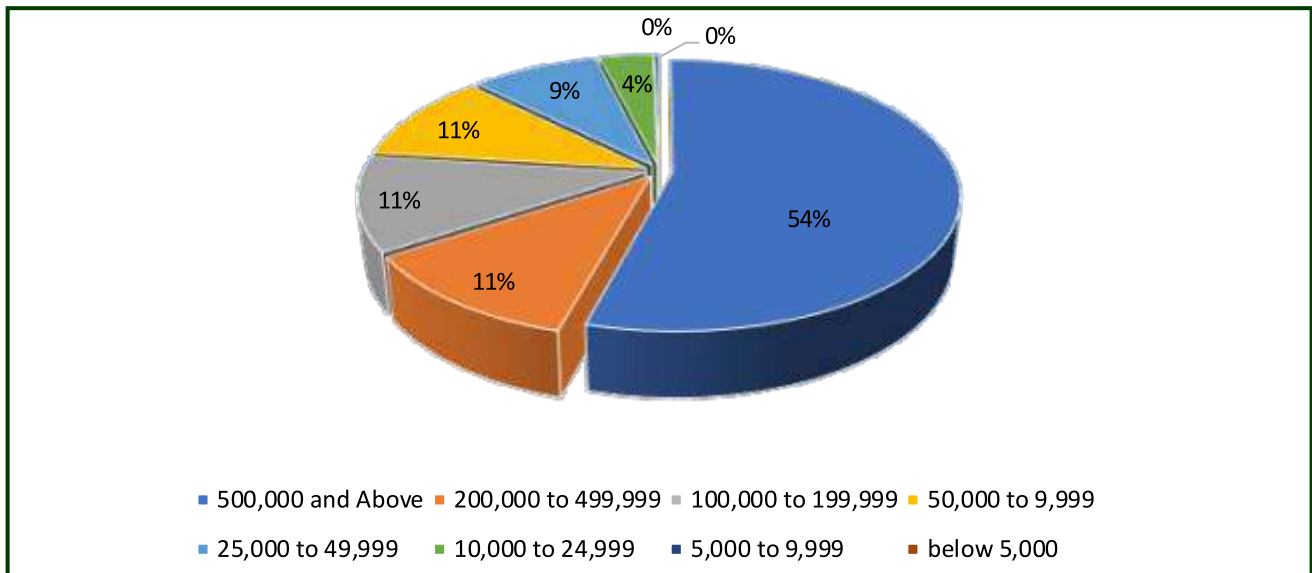


1.4.2. Urbanization Issues and Migration Towards Urban Areas

The migration from rural to urban areas for the sake of better lifestyle, services and job opportunities is very common all over the country. As a result of which, the cities have been grown up at tremendous speed resulting increase of slum areas where the low-income people are living in dilapidated conditions. All this has increased stress on the natural

resources manifold and degraded the environment through cutting of trees, unplanned development, land erosion, noise, air, and waste pollution. The following figure shows that there are around 54% of cities having more than 500,000 population, which brings huge urban problems due to unplanned development, meager resources and urban sprawl.

Number of Urban Localities by Population Size: Census-2017



1.4.3. Exposure of Vulnerable Elements in the Hazard Prone Areas

Poverty is one of the major factors contributing to the vulnerability, under development and exposing communities to disasters. Poverty reduces the capacities of the communities to resist, mitigate and respond to hazard. Absence of safety nets and limited access to assets, shrinks the people's capacity to sustain the brunt of disasters. The poor livings in hazard-prone areas are badly exposed to disaster affects in one way or the other.

Agriculture sector plays a vital role in Pakistan's economy accounting for 18.9% of the GDP, employing 42.3% of the labour force and providing raw material for several value-added industries^[18]. Likewise, the share of livestock in the agriculture sector alone is 58.3% while its contribution to Pakistan's GDP is 11.4%. Specifically, the rural population living in the floods and drought prone areas are dependent upon the agriculture and livelihood as main sources of livelihood and income. Therefore, the impact of floods and drought is very high for these communities. When they are hit by any disaster, their recovery takes unusually longer time. Various disaster impact assessment studies

1.4.4. High Dependency on Agriculture Sector



indicate that these communities suffer more from floods because of agriculture based livelihoods.

1.4.5. Lack of Institutional Capacities to Deal with Disaster Risk Reduction

Institutional capacity of different government department/agencies, particularly at district levels are quite limited to deal with the consequences of major disasters. Lack of coordination between response agencies at federal/provincial level and limited early warning system are main areas of concerns. There is a lack of focus on preparedness because of the capacity and scarcity of resources. All these factors ultimately increase the vulnerability of local population to different disasters.

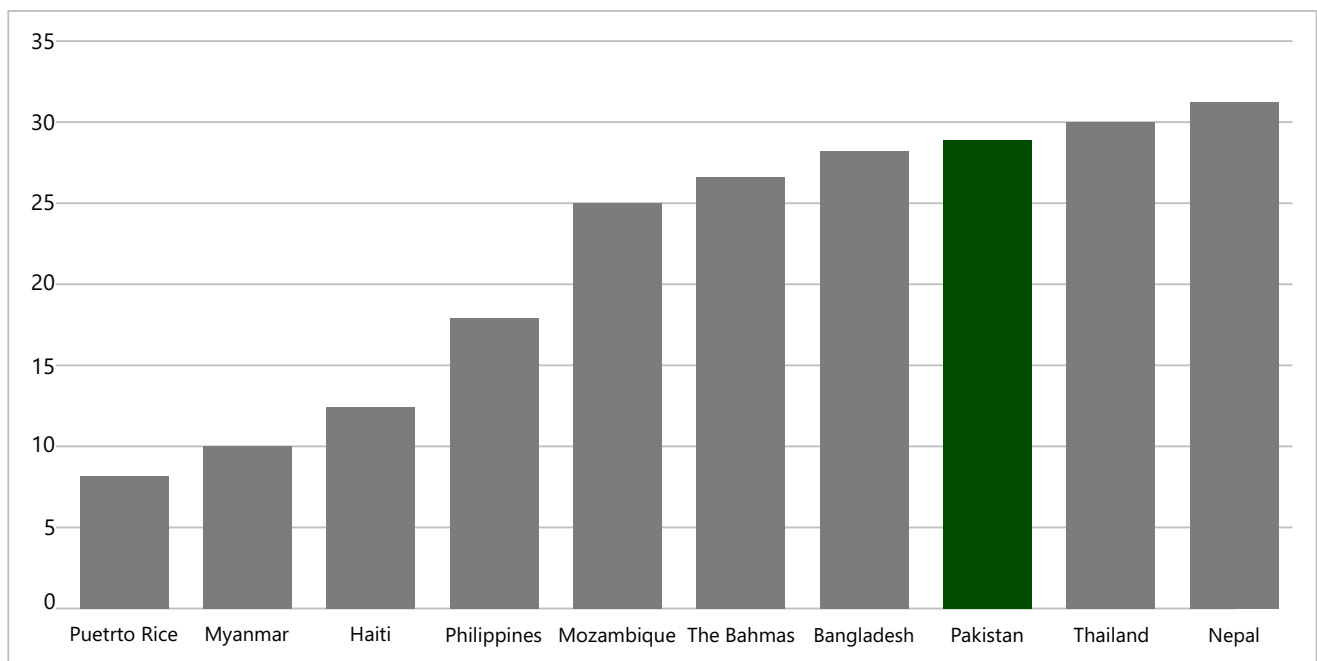
1.4.6. Lack of Landuse Planning and Management

The vulnerabilities in different regions of the country for various hazards are absolutely

distinct. The main reasons are: growing urbanization, mushrooming of slum areas and lack of implementation civic laws. Furthermore, due to over population, agricultural lands and cropped areas are being converted to residential areas; thus, deforestation is causing river erosion, environmental pollution etc. which is further increasing vulnerability to floods and droughts.

1.4.7. Climate Change and its Impact

Pakistan is among the top ten countries badly affecting by the climate change^[19], while the country is on 31st positions in the world's ranking of emitting total greenhouses gases^[20]. Its visible impact in the country can be seen in the form of rapid glaciers melting, losses of biodiversity, sea intrusions, snowstorm in Murree and Galiyat areas, rise in temperatures specifically in urban areas and in the drought prone district, heavy and erratic rainfall, intense flooding, droughts and abnormal shift of the weather pattern etc.



Cumulative Risk Index Score of Top Ten Countries



1.4.8. Weak Early Warning System in Remote Areas

An advance level end-to-end early warning system for floods and other natural disasters are in place in Pakistan. However, dissemination of early warning messages especially for those rural communities living in far-flung rural areas is an uphill task.

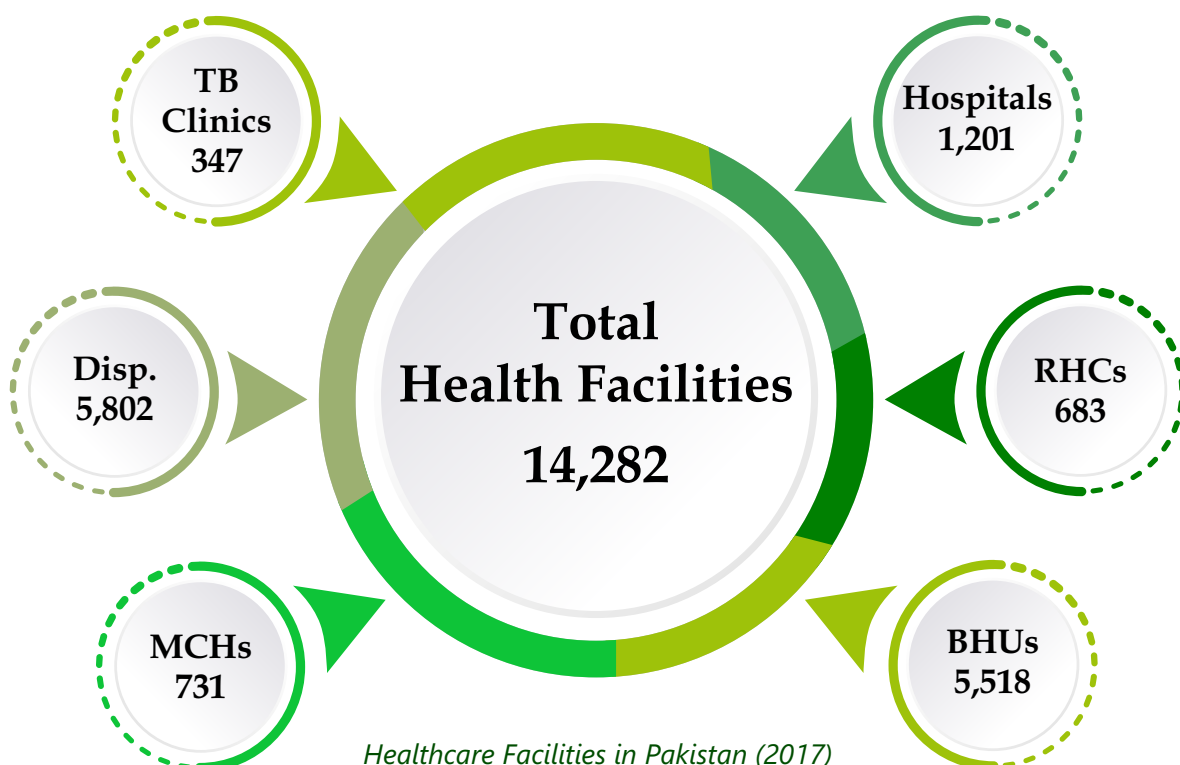
1.4.9. Limited Health Facilities

Natural disasters and climatic changes in Pakistan are affecting human health. Ultimately it results in increasing the number of cases of avian influenza, malaria, cholera, and dengue fever. The climate changes also impact key determinants of health which include; air, water, and food. These also influence the transmission of infectious diseases. Impacts of changing climate will exacerbate a wide range of existing risks to public health and its infrastructure, ranging from effects due to heat and cold

temperature extremes; air pollution, allergen and wildfire exposures; food, water and vector-borne diseases; occupational health risks; and mental health and systemic social impacts.

The health care coverage of the province shows a big gap between service providers and population they supposed to serve. It is critical to build the institutional capacity of the health sector (at provincial, district and local levels) in relation to extreme weather events to reinforce surveillance, early detection and response in the areas of infectious diseases, nutrition, respiratory diseases, water, and food safety.

On the face of the rapid population growth, the health facilities seem very inadequate i.e., 1201 hospitals, 5802 dispensaries, 683 Rural Health Centers (RHCs), 5518 Basic Health Units (BHUs), 347 T.B. Clinics and 731 Mother and Child Health (MCH) centers that are providing health services to the vast population.



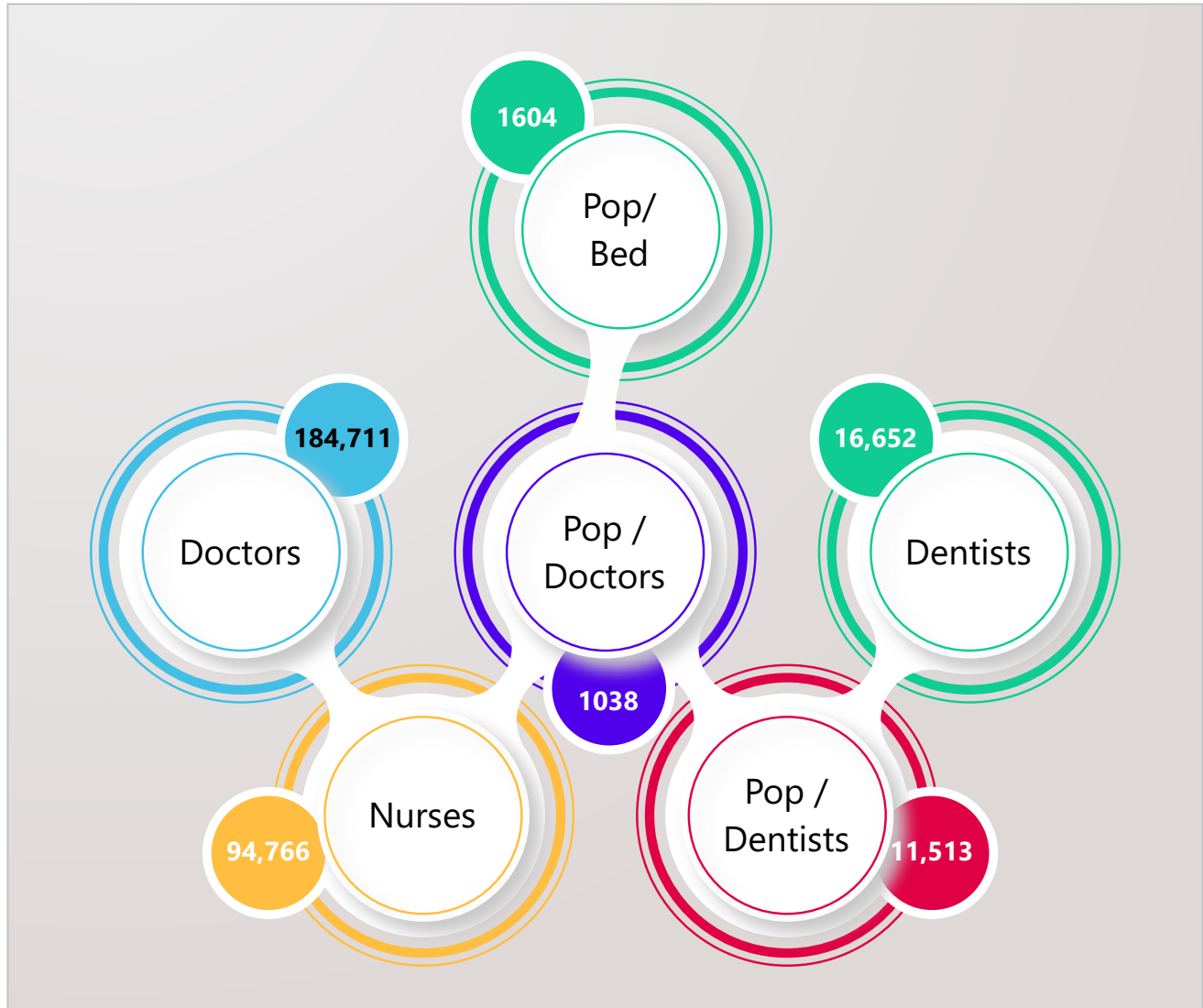
Healthcare Facilities in Pakistan (2017)



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On the other hands, according to the Pakistan Bureau of Statistics 2017, the number of registered doctors were 184,711 while there are 94,766 Nurses. Thus, the population per doctor

counts are 1,038, and 11,513 per dentists and 1,604 per beds, that seems very inadequate for such a large population^[21].

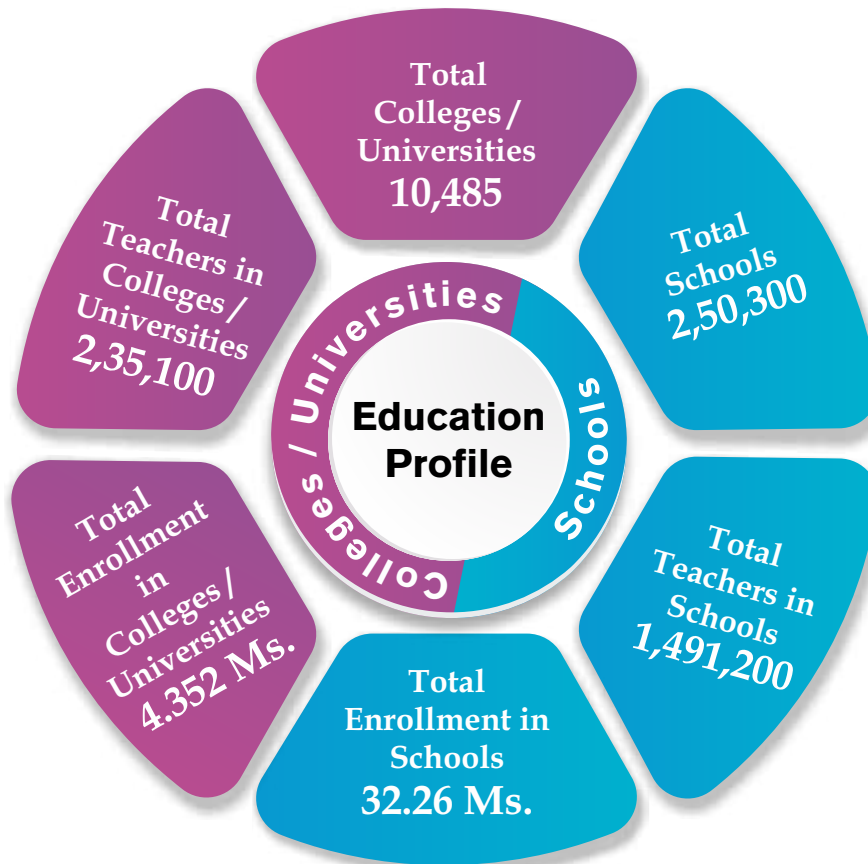


As a whole, around 70% of population are catered by the private sector, while only 30% by the public sector. Pakistan is a low-income country and the public sector health expenditure is 0.92% of GDP as per World Bank data for 2014.

1.4.10. Limited Educational Facilities

According to the Pakistan Bureau of Statistics

2017, there were total of 250,300 schools in the country. The number of students enrolled in these schools were 32.26 million while the number of registered teachers were 1,491,200. Likewise, there were total of 10,485 colleges including 3,800 vocational/technical colleges and only 185 public sector universities.



Education Profile of the Country (2017)

The total literacy ratio found only 58.9%. The female literacy ratio is still need to be improved as at the movement, it is 49.7% as compared to male literacy ratio which is 67.8% during 2017-18. Among the Transgender, it is further less of 38.76%. There should also be special focus to setup more professional and technical institutes/colleges to develop technical skills of the youth. At present there are only 3,800 vocational colleges for such huge population.

1.4.11. Housing Conditions

The number of housing units in the country are 31,915,884^[22]. It is estimated that around 6.4 persons are living in per housing unit, while the number of rooms per housing units are only 2.5. Considerable population both in urban and rural areas are still pose to live in single room housing units.

1.4.12 Lack of investments in disaster risk reduction interventions

DRR activities are essential in preventing or minimizing the negative impact of disasters on people, infrastructure, and the environment. However, a lack of investment in DRR activities can lead to increased vulnerability and risk to disasters. There are several reasons why there may be a lack of investment in DRR activities, including:

- Lack of awareness: Many people and governments may not fully understand the importance of DRR activities and the potential benefits they can bring.
- Short-term focus: Many organizations, including governments, may prioritize short-term gains over long-term investments in



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DRR activities, which can be seen as less tangible or immediate.

- Limited resources: Many governments and organizations may lack the resources to invest in DRR activities, which can require significant funding and expertise.
- Political and economic factors: Political instability or economic challenges can also impact the allocation of resources toward DRR activities.

Investing in DRR activities is critical to reducing the risk and impact of disasters. It can help to build resilience in communities, protect lives and assets, and promote sustainable development. Governments, organizations, and

individuals can take steps to support DRR activities, such as increasing awareness and education, investing in infrastructure and technology, and promoting policies and regulations that prioritize disaster risk reduction.

1.5. Coping Capacities to Managing Disasters

With the passage of time, the National Disaster Management Authority has developed emergency response capacities with the collaboration of allied partners including PDMA's UN and Financial Banks. Below table shows the Humanitarian Response Facilities (HRFs) available in different parts of the country.

Human Response Facilities Across the Country (2022)

S. #	Location	No of Sheds		
		PDMA	NDMA	Total
1	Jallozai/Khyber Pakhtunkhwa	3	1	4
2	Lahore/Punjab	3	1	4
3	Muzaffargarh / Punjab	2	1	3
4	Jamshoro / Sindh	2	1	3
5	Sukkur/Sindh	2	1	3
6	Quetta/Balochistan	3	1	4

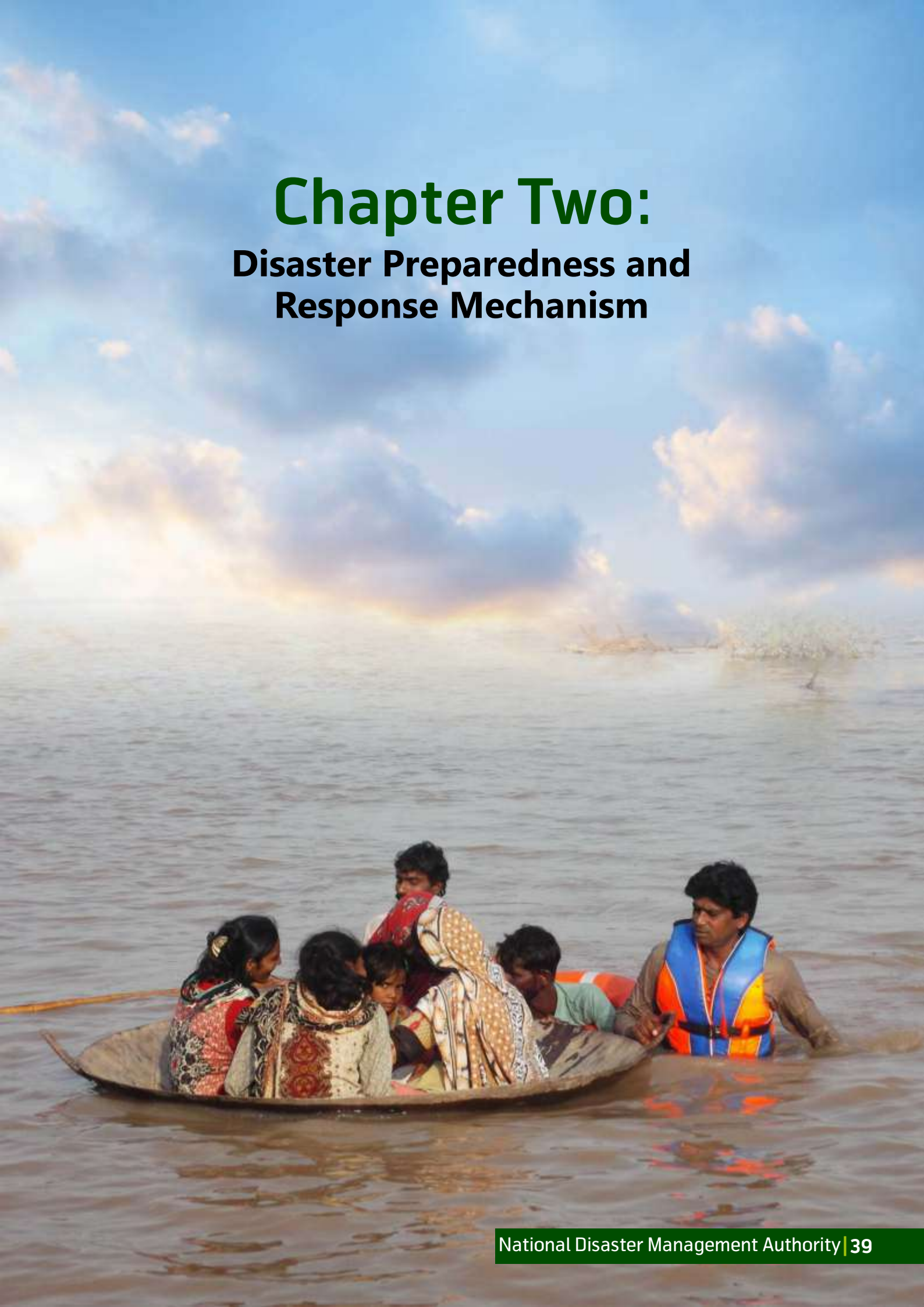
NDMA Warehouses. In addition to strategic HRFs, NDMA has following warehouses in the Country:

- Punjab**
 - Rawalpindi (Central stock to support Punjab/KP/AJ&K/G-B and ICT).
 - Lahore.
- Sindh**
 - Karachi
 - Sukkur (Central stock to support Sindh/Balochistan)

- Balochistan.** Quetta
- Azad Jammu & Kashmir.** Muzaffarabad
- Gilgit-Baltistan**
 - Gilgit
 - Skardu
- Flospans.** 53xFlospans have been established at different locations of the country

Chapter Two:

Disaster Preparedness and Response Mechanism





Chapter Two: Disaster Preparedness and Response Mechanism

2.1. Disaster Preparedness

2.1.1. Developing Contingency Plans

With the collaboration of respective PDMA's, and relevant Government Departments at the Federal levels, the NDMA regularly prepare contingency plans to meet any emergency situation especially developing Monsoon contingency plan is a regular activity before the onset of Monsoon season. Adopting a bottom-up approach, the NDMA compile Monsoon contingency plan based on the DDMA's and PDMA's contingency plans. The contingency planning helps in exploring readiness measures, resource mapping, strengthening the coordination mechanism, early warning dissemination and updation of data to meet any emergency situation.

2.1.2. Resource Inventory

The NDMA updates resource inventories throughout the country with the support of all respective PDMA's and relevant Government Organizations. The latest data on resource inventories helps in pooling resources and plan for those need to be available to meet any emergency situation. The available resource at the HRF and warehouses reviewed and cross check for its durability and integrity. In above section 2.4, detail resource mapping has been given available at various localities throughout the country.

2.1.3. Conducting Regular Drills and Simulation Exercises

In close coordination with the PDMA's and Federal/Provincial Government Organizations, the NDMA conduct regular drills and simulation exercises by involving key emergency response organizations. One of prominent activity is conducting the National Simulation Exercise

(SIMEX) on regular basis at National and Provincial levels. The Exercise is based on multi-hazards' simulated scenario which includes earthquake and floods. SIMEX is aimed at evaluating preparedness and coordination between the national and provincial disaster management authorities and humanitarian community by rehearsing coordination arrangements and emergency response at different tiers in given situations.

At the province levels, the respective PDMA's regularly conduct Mock exercises with the support of other Provincial Government and Non-Government Organizations. They conduct Mock exercises at the local level by involving general public and local government.

2.1.4. Standard Guidelines for Taking Preventive Measures Against Various Hazards

In order to meet any emergency situation, the NDMA has developed standard guidelines for coping with the major disasters in the country. These guidelines have been circulated through contingency plans and available on the NDMA website. Below are some of the guidelines for major hazards.

Measures Against Riverine and Urban Flooding

Based on past experiences, the following measures will help to mitigate disaster/losses:

- a. Respective PDMA's have already identified low-lying areas prone to pondage/inundation not only at the province and district levels but also in the urban areas.
- b. Preparation of hazard maps of major cities against urban flooding based on recorded history for sensitization, awareness, early



- warning and evacuation of vulnerable communities.
- c. Capacity building of Municipal Corporations with priority to Municipal Corporations of mega cities. Attention must be given to availability of requisite number of heavy-duty de-watering pumps and generators at most vulnerable areas of city centres.
- d. Widening, dredging and de-silting of water / sewerage drains.
- e. Removal of encroachments along the flood plains and sewerage drains, thus reclaiming original extents of such drains.
- f. Serviceability and operability of pumping stations.
- g. Provision of backup electricity arrangements in the form of generators for sewage disposal / pumping stations.
- h. Establishment of committee for planning and implementation of contingency plans at municipal level especially in cities like Karachi, Lahore and Rawalpindi.
- i. Identification of likely evacuation sites and relief camps.

Measures against Flash Flood

Flash flood phenomena is becoming more destructive during recent years due to disturbance in weather pattern posed by the climate change, unplanned development, deforestation, and encroachment. During the recent years, serious damages occurred due to flash flooding in Monsoon flooding of 2016, 2017, 2018, 2019, 2020 and most recently during 2022. Following preparedness and mitigation measures will help in reducing the losses from flash floods:

- a. Collect data and record flash flood history in regions prone to such hazards.
- b. Signposting of waterways in local language with known flash flood history. It should

- clearly demarcate threat level of waterways thereby sensitizing the public.
- c. Long term planning for introducing new DRR structural and non-structural measures, relocation and rehabilitation of population living under threat of flash floods.
- d. Strengthening local early warning system with community-based vigilance during dark hours and periods of intense rains by using sirens or announcement on loud speakers of mosques.
- e. Giving priority to commissioning of emergency services like Rescue-1122 and civil defence in inaccessible mountainous areas.

Measures against Earthquake

The following preparedness and mitigation measures will help in reducing the damages caused by the earthquake;

- a. Map out the active fault lines and identify population living close to the active faults. Especially identify people that are more vulnerable to earthquake and need special attention.
- b. Collect past record of major faults and earthquake triggered from these faults.
- c. Establishment and fully capacitate the local level DRM committees for planning and implementation of contingency plans at local levels.
- d. Introduce structural and non-structural DRR measures and arrange necessary repairing and retrofitting to make disaster resilient infrastructure.
- e. Strengthening the community based early warning system and provide proper trainings.
- f. Conduct regular drills and simulation exercises by involving local communities and government machinery
- g. Identify schools and safer areas that can be utilized for evacuation and relief operations



NATIONAL DISASTER MITIGATION PLAN - PAKISTAN REMODELED NDMP-II

- h. Capacity building of Municipal Committees with due attention to availability of requisite number of heavy-duty machineries for pre-placing/ deployment at most vulnerable areas.
- i. Removal of encroachments/ hinderances to provide full access/ way to traffic and rescue personnel with their machinery to the earthquake affected areas.
- j. Ensure serviceability and operability of available machinery with sufficient fuel etc. Provision of backup electricity arrangements in form of generators.
- k. Availability of paramedics and ambulances with respective district health departments.
- l. Identification and coordination with local health officials for stocking medicine, in case of being cut off or likely outbreak of health emergency, especially against diseases likely in winters.
- m. Vulnerability based stockpiling of commodities required during emergencies by the local administration and line departments.

Measures against Landslides/Avalanches

Threat of landslides/avalanches in vulnerable areas underscores outlook of impending Monsoon-2021. It merits reappraisal of basic precautionary measures such as:

- a. Prepare hazard and risk assessment and mapping the active landslide prone areas.
- b. Refresh recorded history of landslides / avalanches prone areas. Besides vulnerability risk assessment; personal experience of notables of such areas can also prove beneficial.
- c. Local communities of vulnerable areas be sensitised to pay special attention to weather forecasts / alerts as heavy rains can trigger landslides / avalanches. Sudden temperature variability has the potency to trigger avalanches in vulnerable areas.
- d. Community based early warning system as part of response mechanism be instituted in landslide / avalanche prone areas by nominating local notables to ensure that alerts are timely disseminated. Measures may include use of watchmen, loudspeakers/ megaphones, loudspeakers of Mosques, whistles, SMS alerts, telephone and any other arrangements of similar nature.
- e. Based on landslide / avalanche alerts issued by PMD, local administration may consider precautionary closure of roads/ tracks to avalanche/ landslide prone areas and evacuation to safer places as a contingency planning.

Measures against GLOF

- a. Civil Engineering Interventions. To prevent the lake outburst, following civil engineering interventions may be considered:
 - Prevent over topping of the lake water and strengthen moraine dam by concrete cementing, gabion wall etc.
 - Keep volume of stored water in the lake to a safe level; initially by dropping the level and then by excavating a tunnel or deepening the breach of the moraine-dam to retain the lower level through any one of the following: -
 - ✓ Siphon system.
 - ✓ Electrical pumping.
 - ✓ Controlled blasting of the moraine-dam.
- b. Preparation of hazard and risk maps of the GLOF affected areas.
- c. In order to predict and understand GLOF on its occurrence, evaluation of possible hydrograph along water channel downstream.



- d. Placement of round the clock monitoring and early warning system at identified GLOF sites.
- e. Construction of adequate trapping dams with capacity to dissipate the GLOF impact.
- f. Strengthening infrastructures to make these robust enough to resist GLOF destruction.
- g. Measures to timely disseminate information to the vulnerable populace.
- h. Rehearsal / contingency planning to shift vulnerable communities to safer places.

Measures against Cyclones

The following guidelines can help/ protect people in vulnerable areas:

- a. Carry on risk assessment and enlist villages and UCs prone to Cyclone hazards. Inventory of resources available at local levels and plan for further enhancement of resources.
- b. Prepare contingency plans at local levels to prepare for any emergency situation. Collect important contact details of government and non-government stakeholders and focal persons
- c. Provision of emergency kit and provide trainings on the use of emergency response equipment.
- d. Develop liaison with the local television, radio station and social media activists to keep abreast with the developing situation.
- e. Removal of billboards and any heavy objects especially in urban areas.
- f. Necessary repairing/retrofitting at houses, offices and at commercial markets to strengthen buildings
- g. Provide necessary trainings and conduct mock exercises involving all machinery and local communities
- h. Formation and activation of local committees that will support during the evacuation to nearest safe zone or high ground and

incharge of local arrangement at the relief camps.

- I. Collect data of fishermen working in the surrounding sea and plan for informing them while they are at the sea

Measures against Winter Hazards

Following protective measures based on past experiences will help to mitigate disaster/ losses:

- a. Preparation of hazard maps of major cities, districts and known vulnerable areas based on recorded history for sensitization, awareness, early warning and evacuation of vulnerable communities.
- b. Establishment of committees of volunteers for planning and implementation of contingency plans at municipal level.
- c. Identification of vulnerable areas especially near communication arteries and population.
- d. Awareness and sensitizing local community and tourists of possible risks and adherence to laid down guidelines.
- e. Strengthening the community based early warning system and provide proper trainings.
- f. Capacity building of Municipal Corporations with due attention to availability of requisite number of heavy-duty machineries for pre-placing/ deployment at most vulnerable areas.
- g. Widening, dredging and de-silting of water channels to prevent waterlogging and saturating soil.
- h. Removal of encroachments/ hinderances to provide full access/ way to traffic and rescue personals with their machinery when in case of need.
- i. Serviceability and operability of available machinery with sufficient fuel etc. Provision of backup electricity arrangements in form of generators.



- j. Identification of likely evacuation sites and relief/ medical camps.
- k. Coordination with all stakeholders for keeping communication arteries open and immediate mobilization of required machinery in time of need.
- l. Identification and coordination with local health officials for stocking medicine, in case of being cut off or likely outbreak of health emergency, especially against diseases likely in winters.
- m. Availability of paramedics and ambulances with respective district health departments.
- n. Coordination with private and government hospitals to prepare a synergized plan for meeting emergent requirements.
- o. Measures for creating redundancy in utility supply to inaccessible areas especially drinking water.
- p. Pruning of trees especially ones close to roads, electricity supply lines, homes and other infrastructure.
- q. Emergency contact numbers of local and other emergency services must be displayed at various locations and made part of all coordination meetings for maximum awareness.
- r. Fixing of loose billboards, hoardings, sign posts and other similar fixtures must be ensured.
- s. Encouragement of communities to remain indoor and restrict movement immediately upon development of weather and especially when a weather advisory/ alert is issued.
- t. Vulnerability based stocking be carried out under local administration and line departments.
- u. Utilization of all possible platforms for spreading required information and keep local radio stations involved in relaying

critical information.

2.2. Coordination Mechanism During Response and Early Recovery Phase

2.2.1. Declaration of Emergency

The declaration of emergency depends upon the natural and magnitude of the disaster. Disaster situations of a smaller scale which are within the capacity of District authorities would be managed by the respective District Authorities on the declaration of emergency by the province.

In case of disaster situation of a relatively larger scale which overwhelms the capacities of District Governments/Authorities but are within the capacities of Provincial Governments/Authorities to manage shall be declared by the province.

In case of disaster situation of a large scale of that overwhelms the capacities of provincial Government/Authorities but are within the capacities of Federal Government to manage primary through National Emergency. However, international assistance can be requested by the Government in case of disaster situation is of mega scale when the National Capacities are over whelmed.

2.2.2. Criteria for Declaring an Area Disaster Affected

As per the National Calamities Act- 1958, if more than 50% loss of livelihood of the affected population has occurred, the District and Provincial Authority declare the area "calamity Affected". Normally, a technical committee is formed to assess the situation after a relief phase and make recommendations to Prime Minister for the National calamity and Chief Minister for Provincial calamity for declaring the area calamity- affected. The loss of human lives, damages to property, livelihood, infrastructure



and mass displacement are some of the important considerations for declaring an emergency in the country.

2.2.3. Operationalization of the Emergency Operation Centers

A network of well-established National and Provincial Emergency Operation Centers (N/PEOCs) are already in place with state-of-the-art equipment to receive early warning and its dissemination to relevant authorities and general public. These EOCs also serve as hub for issuing damage and needs information to the public, media, ministries, departments and humanitarian response agencies. One of major role of the EOCs is to ensure an effective coordination mechanism and management of relief operations in affected areas through respective PDMA and further by the DDMA. All the agencies such as Emergency Services, Civil Defence, Armed Forces, Pakistan Police Services, Pakistan Red Crescent Society and other humanitarian agencies will be coordinated by the EOCs at respective levels. Although the EOCs operate 24/7 in disaster and non-disaster times, however, during the disaster times, the EOCs regularly monitor and conduct meetings to coordinate for an effective emergency response and relief operations.

As mentioned above also that NDMA has already a well-coordinated mechanism and have a networking with all S/PDMAs and further with the DEOCs for emergency response operation and activation of EOCs at various levels. A quick acquisition of information and dissemination of information to concerned authorities are already in place and necessary gadgets have been provided to Provincial and Districts emergency operation centers to fully functionalize on the 24/7 basis.

2.2.4. Activation and Stand Down Procedures of the National Emergency Operation Centre (NEOC)

The NEOC has the following procedure for activation of the center in case of any emergency situation:

(1) On Receipt of Alerts (Standby-Stage 1)

Director response will collect information from PEOC/DEOC about the potential disaster, after analysis of situation, advise/recommend chief coordinator at the NEOC for alerts or standby position of NEOC. Chief coordinator will update the chairman NDMA and to seek his approval for activation of NEOC. Standard Operating Procedures to be followed for this stage are:

- Monitor the situation.
- Alerts the NEOC staff for operationalization of NEOC at short notice.
- Put everything ready and functional in the NEOC.
- Coordinate with key ministries, departments, JS HQ, armed forces, NLC, humanitarian organizations and alerts them.
- Closely coordinate with respective PEOCs to get information and review it.

(2) On Receipt of Warning (Stage 2)

Chairman NDMA will issue notification for full activation of the NEOC. Chief coordinator will inform key ministries, federal government department, and respective PEOCs, emergency services, civil defense, I/NGOs, UN agencies, PRCS, and media. NEOC will remain fully operational on 24/7 basis. SOPs to be followed for this stage are:

- Place NEOC on fully activation/operational role.
- Open all communication systems and links.
- Collect essential information including situation updates, details of resources etc. which will be required for relief operation.
- Inform all relevant ministries and department and ask them to send their



representatives/liaison officers to operate from the NEOC.

- Chief coordinator/chairman NDMA may meet the NDMC to update on the situation.
- Share information regularly with PEOCs.

(3) Stand Down Procedure (Stage 3)

After reviewing situation and consultation with concerned PEOCs, chief coordinator NEOC will recommend the chairman NDMA for stand down. After getting approval of chairman NDMA, chief coordinator NEOC will issue notification of stand down to the key ministries and departments at federal/provincial and to the PDMAAs to be followed for this stage are;

- Director NEOC will debrief chief coordinator about stand down who will advise chairman NDMA for approval of stand down.
- Director NEOC will disseminate notification to the relevant ministries, department and other stakeholders.
- Final report on the emergency operations will be circulated to key stakeholders.
- Inform PEOC and DEOC for stand down and share final report with them.
- NEOC staff work in normal mode.

2.2.5. Activation of Clusters

Depends upon the severity and magnitude of the disaster, the clusters are activated by the UN agencies upon request from the Government of Pakistan. The clusters are designated by the Inter Agency Standing Committee (IASC) and have clear responsibilities for coordination. These clusters during emergencies are led by the UN Humanitarian Coordinator, to support of the Government in emergency response and recovery operations.

During recent disasters, specifically in the earthquake 2005, flood 2010 and flood 2022, the cluster approach works very successfully to avoid duplication, strengthen partnerships, the

predictability and accountability of international humanitarian actions, by improving prioritization and clearly defining the role and responsibilities of humanitarian organizations. At respective levels, the various clusters are activated working closely with the District, Provincial and National Disaster Management Authorities to get updates and take appropriate actions to provide relief services to the disaster affected areas. The clusters meet on regular basis headed by the respective disaster management authorities followed by appropriate actions.

2.2.6. Multi-Sector Initial Rapid Assessment

Multi-Sector Initial Rapid Assessment (MIRA) has been conducted in Pakistan twice after the floods of 2012, 2014 and 2022. MIRA-2014 lessons learnt exercise highlighted two major gray areas in implementation including unavailability of trained enumerators at the time of assessment and lack of validation mechanism. Subsequently, rounds of revisions were conducted to keep MIRA up-to-date and relevant in emerging situations.

The standard guidelines for MIRA have been developed by NDMA with technical support of UNOCHA to provide operational guiding principles on roll-out and implementation of MIRA. Approach adopted for these Guidelines is inclusive, comprehensive, decentralized and focused on institutionalization of initiatives. MIRA methodology document has been exclusively consulted for the development of these Guidelines. To familiarize and making practice on the MIRA tools, NDMA has conducted series of trainings throughout the country and has developed pool of trained professionals from various government organizations. In case of any emergency situation, the MIRA team will be activated. The



initiation of MIRA process shall be undertaken as under:

- The respective provincial disaster management authorities after analyzing and assessing the nature and severity of a particular disaster, declare it as of medium, high or mega intensity.
- Respective provincial and state governments through PDMA shall request NDMA for initiation of MIRA process. However, NDMA will make a final decision in consultation with all stakeholders.
- NDMA may ask UNOCHA to coordinate with PDMA to involve humanitarian partners i.e., UN agencies/clusters/sector coordinator, and I/NGOs etc. and any other member deemed necessary to support the activities.

2.2.7. Media Management During Emergencies

Media can play vital role in disaster response/management. Therefore, a well-organized arrangement be made at all tiers for information sharing/periodic media briefs by appropriate spokespersons. Efforts must be made to provide timely updated and accurate inf to media houses for dissemination. Delays in provision of inf may lead to frustration and misunderstanding by media house should be discouraged at all levels.

To disseminate authentic and up-to-date information, the NDMA dedicates spokespersons for briefing on the current situation, and release of data to media personnel on day-to-day basis. These informations further updated on website as well as media briefing organized for electronic and print media to inform general public about the situation.

2.2.8. Monitoring and Evaluation

During the execution of the response phase, to

track the progress and facilitate the mid-course correction, effective/efficient monitoring is mandatory. Post disaster evaluation is vital to determine the relevance and fulfillment of objectives. An evaluation should provide info that is vital to determine the relevance and fulfillment of objectives. NDMA conduct regular meetings and follow frequent interaction with government and non-government actors for effective measure to monitor their activities. Besides, NDMA publishes paper to share lesson learned after the disaster retreat.

2.3. NDMA's Major Initiatives for 2023 and beyond

After the promulgation of the National Disaster Management Act during 2010, a robust disaster management system is already in place throughout the country. During the past 23 years, significant milestones have been achieved to strengthen the disaster management system with focus on shifting paradigm from reactive to proactive approach where more focus has been given on preparedness, prevention, mitigation, developing disaster resilience and disaster risk reduction at all levels. To follow the pace, the NDMA has planned the following major initiatives for 2023 and beyond.

2.3.1. National Monsoon Contingency Plan-2023

Being one of major initiative, the NDMA with the collaboration of various disaster management stakeholders both at federal and provincial levels, shall develop National Monsoon Contingency Plan for 2023. The NDMA normally prepare early monsoon contingency plan based on analysis of seasonal forecast issued by the PMD and likely impacts of climate change. In this Plan, explicit guidelines shall be lay down for all DM tiers and other relevant stakeholders for mitigation of likely



hazards, preparedness against most probable and worst-case scenarios and mounting an effective and timely response to a situation resulting from monsoon heavy rainfall.

2.3.2. National Contingency Plan for Winter 2022-23

For the first time, the NDMA has prepared the National Contingency Plan for Winters 2022/23 in close coordination with all the government department both at federal and provincial levels. The plan has been developed based on analysis of seasonal forecast by the PMD and likely impact of climate change. In this plan, explicit guidelines have been outlined for all DM tiers and other relevant stakeholders for mitigation of primary and secondary hazards associated with the winter season, preparations against most probable and worst-case scenarios for mounting timely response to arising situation.

2.3.3. Remodeling of the National Emergencies Operations Centre (NEOC)

The salient features of the NEOC are as follows:

- A. The establishment of the NEOC has been principally approved as hub of decision enabling information and shared terrestrial intelligence from all national and maximum global systems, including:-
 - Global Early Warning systems - 5 to 10
 - UN and Satellites feeds
 - NDMA's Regional and Global equivalent organisations
 - Common Alerts Protocols - US, China, Canada, Australia etc.
 - Pakistan Meteorological Department (PMD)
 - Federal Floods Commission (FFC)
 - Geological Survey of Pakistan (GSP)
 - National Highways Authority

- All provincial and districts set ups (PDMAs & DDMAAs)
- B. At the NEOC, a daily common operating picture (CoP) will be generated after fusing multilayered climate and geographical data filtered through professional analysis. Automatically fed to all national media and info mediums. The NEOC will remain active, staffed and continuously manned.
 - C. Besides a bulk financing will be coordinating at this platform.
 - D. Smaller Situation Room (at PM Secretariat) will extend to all NEOC members.
 - E. It will further provide outputs for national leadership and foreign delegates, as required.

2.3.4. Initiatives Plan at the Platform of National Institute of Disaster Management (NIDM)

Since 2009, the NIDM is actively engaged in building capacities of the government and non-government disaster management stakeholders through imparting knowledge i.e., by developing training toolkits, conducting series of disaster management/climate related trainings, and create awareness among the general masses through IEC material.

During the current year, the NIDM shall closely work with the Academia, shall conduct local needs and gap analysis and shall develop framework of recommended national preparedness and response. The proposed dates for organizing these activities are as follows.

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Sr.	City	University/Venue	Dates (Tentative)
1.	Quetta	Bilal Auditorium	15-16 March 2023
2.	Lahore	UET Lahore	21-22 March 2023
3.	Gilgit-Baltistan	FCNA Auditorium	27-28 March 2023
4.	Peshawar	11 Corps Auditorium	13-14 April 2023
5.	Muzaffarabad	5 AK Bde Auditorium	3-4 May 2023
6.	Bahawalpur	Islamia University	17-18 May 2023
7.	Karachi	NED University	1-2 March 2023
8.	Islamabad	NUTECH	30-31 May 2023

Furthermore, with the financial support of various non-government stakeholders, the

NIDM shall impart the following trainings during 2023:

S. #	Activity	Date	Location	Donor	Participants (Departments)	Seats	
						Stake holders	NDM A
1	Climate and Disaster Resilient Urban Planning & Development	15 – 16 Feb	Muzaffarabad	UNHABITAT	NDMA, SDMA, related government departments, development authorities, urban developers, NGOs, academia and media	30	2
2	Climate and Disaster Resilient Urban Planning & Development	27 – 28 Feb	Lahore	UNHABITAT	NDMA, SDMA, related government departments, development authorities, urban developers, NGOs, academia and media	30	2
3	Forest Fire Prevention & Mitigation	13 – 14 March	Abbottabad	Concern	NDMA, PDMA, DDMA, related government departments, NGOs, academia and media	25	2
4	Forest Fire Prevention & Mitigation	16 – 17 March	Shangla	Concern	NDMA, PDMA, DDMA, related government departments, NGOs, academia and media	25	2
5	Forest Fire Prevention & Mitigation	4 – 5 May	Gilgit	Concern	NDMA, PDMA, DDMA, related government departments, NGOs, academia and media	25	2
6	Flood Preparedness & Response Training & Simulation Exercise (SIMEX)	8 – 10 May	Ghizer	Concern	NDMA, PDMA, DDMA, related government departments, NGOs, academia and media	25	2
7	Flood Preparedness & Response Training & Simulation Exercise (SIMEX)	23 – 25 May	Swat	Concern	NDMA, PDMA, DDMA, related government departments, NGOs, academia and media	25	2
8	Flood Preparedness & Response Training & Simulation Exercise (SIMEX)	13 – 15 Jun	Chitral	Concern	NDMA, PDMA, DDMA, related government departments, NGOs, academia and media	25	2



NATIONAL DISASTER MITIGATION PLAN - PAKISTAN REMODELED NDMP-II

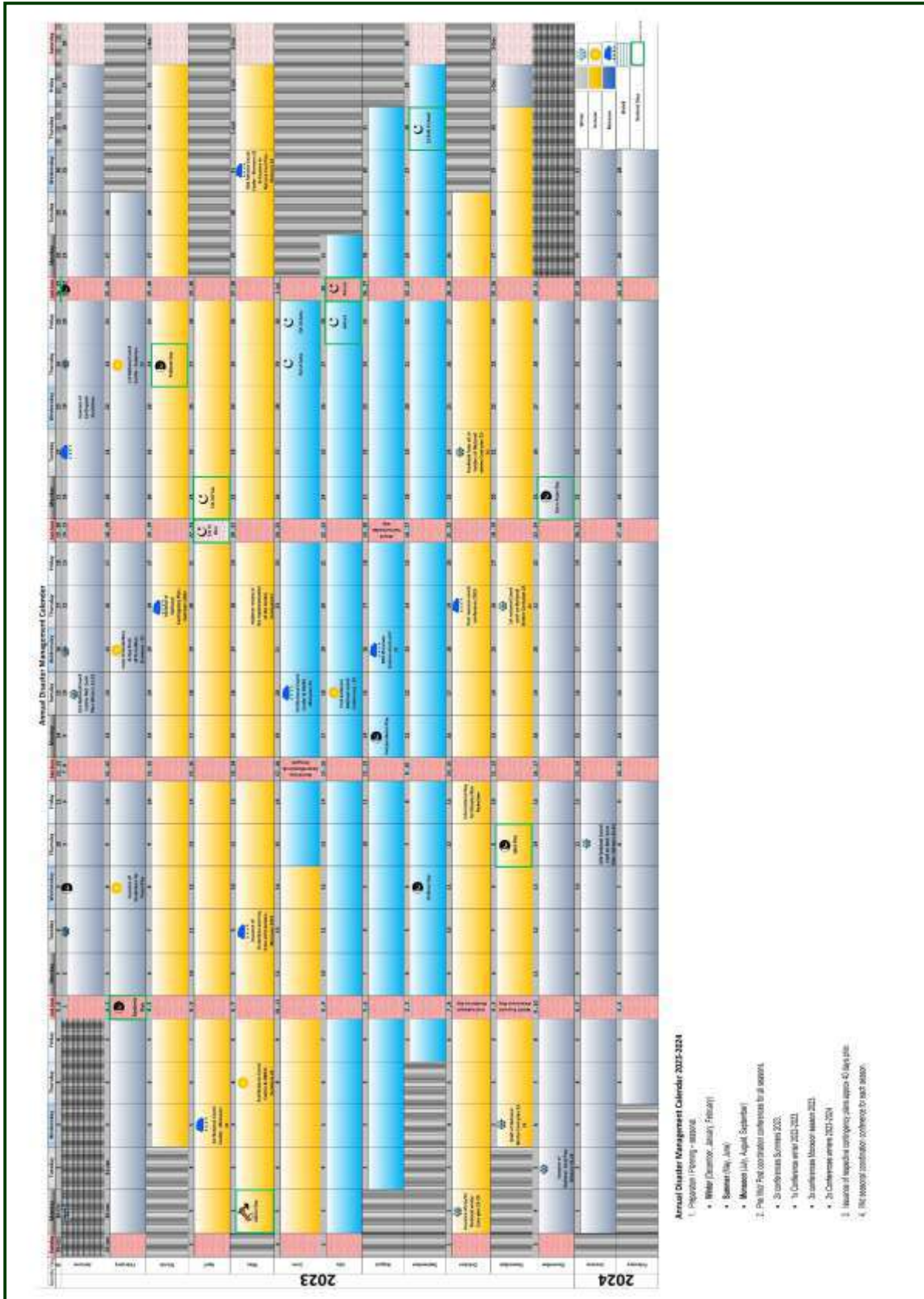
9	Flood Preparedness & Response Training & Simulation Exercise (SIMEX)	20 – 22 Jun	Kohat/ Nowshera	Concern		25	2
10	Flood Preparedness & Response Training & Simulation Exercise (SIMEX)	12 – 14 July	Astore	Concern	NDMA, PDMA, DDMA, related government departments, NGOs, academia and media	25	2
11	Flood Preparedness & Response Training & Simulation Exercise (SIMEX)	17 – 19 July	Hunza	Concern		25	2
12	Flood Preparedness & Response Training & Simulation Exercise (SIMEX)	8 – 10 Aug	Skardu	Concern	NDMA, PDMA, DDMA, related government departments, NGOs, academia and media	25	2
13	Climate and Disaster Resilient Urban Planning & Development	23 – 24 Aug	Peshawar	UNHABITAT	NDMA, PDMA, related government departments, development authorities, urban developers, academia, media and NGOs	30	2
14	Climate and Disaster Resilient Urban Planning & Development	13 – 14 Sep	Gilgit	UNHABITAT		30	2
15	Climate and Disaster Resilient Urban Planning & Development	4 – 5 Oct	Karachi	UNHABITAT		30	2
16	Climate and Disaster Resilient Urban Planning & Development	18 – 19 Oct	Quetta	UNHABITAT		30	2
17	Climate and Disaster Resilient Urban Planning & Development	8 – 9 Nov	Islamabad	UNHABITAT		40	5

2.3.5. Disaster Management Calendar

Besides the above major planned activities, the NDMA has prepared the following disaster

management calendar to achieve the set targets during 2023.

NATIONAL DISASTER MITIGATION PLAN - PAKISTAN REMODELED NDMP-II



Chapter Three:

Proposed DRR Strategy and Implementation Framework





Chapter Three: Proposed DRM Strategy and Implementation Framework

3.1. Target Priority Interventions

This plan serves as a guiding document to implement the targeted DRR strategy during 2023 and beyond as on-going activities. The implementation of this plan will be carried out

in synergy with the National DRR Policy, National Disaster Management Plan 2012-2022 and National Disaster response Plan 2018 at all levels.

Strategies	Priority Actions/Interventions	Linkages with the SFDRR	Responsible Organizations (Lead Organization in bold)	Proposed Activities for 2023			
				1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
3.1.1. Functionalize the DRM System at all Levels	a. Development of technology driven National Emergencies Operations Centre (NEOC), with 24/7 operational capabilities for constant monitoring and reporting of hazards, and taking the lead in providing swift emergency response.	Priority 1: 24 (f) and Priority 2: 27 (a)	NDMA	X	X	X	X
	b. Develop monitoring system to operationalize and link between NEOC, PEOCs, and further to the DEOCs	Priority 1: 24 (f) and Priority 2: 27 (a)	NDMA, S/PDMA & DDMA s	X	X	X	X
	c. Synergize inter-agency planning for joint efficient response, helping lower tiers without overstepping mandates.	Priority 2: 27 (a)	NDMA , all relevant govt department, S/PDMA & DDMAs	X	X	X	X
	d. To be rearticulated and staffed by related and experts on subjects of emergencies preparedness and disaster risks reduction.	Priority 1: 24 (j)	NDMA , and S/PDMAs	X	X	X	X
	e. Establish technology driven National Capability to collate maximum database and inputs; fused into live Common Operating Picture (CoP) for information and use by all national stakeholders and departments.	Priority 1: 24 (f) and Priority 2: 27 (a)	NDMA , all relevant govt department, S/PDMA & DDMAs	X	X	X	X



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3.1.2. Developing Multi-Hazard Vulnerability and Risk Assessment Profile at National Levels	a. Seek funding and technical support for the establishment of state-of-the-art GIS and Remote Sensing Labs at NDMA to maintain digital record including GIS based maps, relevant data regarding the MHVRA database, disaster damages, develop modelling by using the satellite images, GIS/RS software, and hardware.	Priority 1: 24 (c, k and m)	NDMA, Financial Banks, UN & SUPARCO				X
	The step-wise human resource capacity enhancement will help to full functionalize the GIS/RS Unit at NDMA						
	b. Conduct research on the “Use of Artificial Intelligence for Emergency Management”	Priority 1: 24 (c, k and m)	Academia and World Bank		X		
	a. Undertake fast track completion of left-over Multiple Hazards Vulnerability Risks Assessments (MHVRA) for high priority zones and maintain updated National Risk Atlas, as foundation data bank for all DRR trajectories and scenarios.	Priority 1: 24 (c, k and m) Priority 3: 30 (f)	NDMA, SUPARCO and S/PDMAs	X	X		
	b. Working with the S/PDMAs to prioritize province wise at-risk districts for future DRM planning and implementation	Priority 3: 30 (f)	NDMA and S/PDMAs		X		
	c. Conduct hazard specific risk assessment for Locust, Heatwave and Snowstorm and prioritize at risk districts to these specific hazards	Priority 4: 33 (a)	NDMA and S/PDMAs		X	X	
3.1.3. Developing Disaster Risk Management Plans at Various Levels	a. Each PDMA shall develop at least five DDMPs in each province with focus on climate induced hazards. S/PDMAs to prioritize and select five districts as per the vulnerability profile	Priority 2: 27 (b) Priority 3: 30 (g)	S/PDMAs and DDMPs		X	X	X



3.1.4. Climate Change Adaptation	a. Afforestation of Mangrove plantation in Balochistan and Sindh Province	Priority 2: 27 (2) Priority 3: 30 (c)	Forest Department, PDMA Balochistan/Sindh, DDMA's, Coastal Development Authority	X	X	X	X
	b. Formation of crab/shrimp farms and give proper trainings to ensure its growth and production on sustainable basis, and further	Priority 2: 27 (2) Priority 3: 30 (c)	Coastal Development Authority, PDMA Balochistan/Sin		X	X	
	develop market linkages for fishermen communities		d, DDMA's, UN, I/NGOs				
	c. Afforestation of trees through social forestry projects in upper catchment areas	Priority 2: 27 (2) Priority 3: 30 (c)	Forest department, PDMA's, agriculture department, irrigation department, and DDMA's	X	X	X	X
	d. Introduce online and in person training courses on Climate change adaptation courses through NIDM	Priority 4: 33 (a) IV (42) 47(d)	NIDM, NDMA, UN, I/NGOs, and Global Change Impact Studies Center		X	X	X
	e. Encourage universities/academia about the need of conducting scientific research on climate change, its causes, and possible remedies in the form of different strategies to climate change mitigation and adaptation	Priority 1: 24 (h, l, and j)	Ministry of Climate Change, NDMA, S/PDMA's, Global Change Impact Studies Center and other Academia		X	X	X
3.1.5. Promoting Climate Smart and Disaster Resilient Sustainable Development	a. Promoting disaster resilience construction with focus on conducting trainings for technical workforce on "mainstreaming DRR into future development projects"	Priority 3: 30 (c, and e) Priority 4: 33 (C)	NDMA, Pakistan Engineering Council, PWD, CDA, Provincial Works and Services Department, S/PDMA's, Academia, Public Health and		X	X	



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			Engineering Department, Planning and Development Department					
	b. Ongoing activity and planning for mobilizing funds and technical skills in sector specific retrofitting/repairing of critical buildings	Priority 3: 30 (b) Priority 4: 33 (a)	Planning and Development Department, Engineering Council, PWD, CDA, Provincial					X
			Works and Services Department, NDMA, S/PDMAs, Education, Public Health and Engineering Department,					
3.1.6. Strengthening of Multi-Hazard Early Warning System	a. Promoting community-based flood early warning system and develop standard guidelines for follow-up at Provincial levels	Priority 2: 27 (h) Priority 4: 33 (b, & m)	PMD, FFD, S/PDMAs and DDMA	X				
3.1.7. Building Capacities Through Training and Research	a. Strengthening of the National Institute of Disaster Management (NIDM) and seek funding for establishing the NIDM complex (Ongoing activity)	Priority 1: 24 (g and i) Priority 2: 27 (a) Priority 3: 30 (i)	NDMA and NIDM	X	X	X	X	
	b. Organize face-to-face trainings on various aspects of the Disaster Risk Management and Climate Change Adaptation	Priority 1: 24 (g and i) Priority 2: 27 (a)	NIDM, GCISC, and NDMA	X	X	X	X	
	c. Organize self-paced and online courses different topics and aggressive marketing to reach to all government officials for such courses	Priority 1: 24 (g and i) Priority 2: 27 (a)	NIDM and NDMA		X	X		
	d. Conduct scientific research by involving academia/research instructions to study climate change and its possible impact in different areas of the country	Priority 1: 24 (h, l, and j)	Academia, GCISC, S/PDMAs and NDMA	X				

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	e. Conduct regular drills/simulation exercises on preparedness for monsoon rains and flooding and conduct SIMEX exercises at National and Provincial levels	Priority 4: 33 (h)	NDMA and S/PDMAs	X	X	X	
	f. Promoting disaster education in syllabus of schools, colleges and universities	V: 36 (a) (ii)	HEC, Provincial Education Departments, S/PDMAs and NDMA	X	X	X	X
	g. Commemoration of Disaster Preparedness Week	Priority 4: 33 (h)	Provincial Education Departments, S/PDMAs and NDMA	X	X	X	X
	h. Building National Disaster Museum (Long term plan)	Priority 3: 30 (e)	NIDM and NDMA			X	X
3.1.8. Community Involvement in Reducing Disaster Risk at Local Level	a. Conduct mass information campaigns, for communities especially in affected zones through all modes and mediums	Priority 2: 27 (h) Priority 4: 33 (m)	DDMAs, S/PDMAs, NDMA and all Non-Government Stakeholders	X			
	b. Continuation of capacity enhancement of communities through various trainings, TOTs and further its cascading at local levels	Priority 2: 27 (h) Priority 4: 33 (m)	S/PDMAs, Rescue 1122, Civil Defence, PRCS, DDMAs, UN and I/NGOs	X	X	X	X
	c. Develop volunteer database professionally trained in DRM and emergency response management related courses	Priority 1: 24 (g and i) Priority 2: 27 (a)	S/PDMAs, Rescue 1122, Civil Defence, PRCS, DDMAs, UN and I/NGOs		X	X	X
	d. Conducting regular drills and mock exercises, especially before the onset of the monsoon season, and ensure liaison with the local disaster management committees and their members.	Priority 4: 33 (h)	S/PDMAs, Rescue 1122, Civil Defence, PRCS, DDMAs, UN and I/NGOs	X	X	X	X
3.1.9. Preparedness for Effective Emergency Response	a. Revise and update hazard specific contingency plans	Priority 4: 33 (a)	NDMA and S/PDMAs	X	X		
	b. Stockpiling and upgradation of the regional HRF and warehouses for handling emergencies.	Priority 4: 33 (d)	NDMA and S/PDMAs	X	X		



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	c. Promote public-private partnership in preparedness for emergency response.	III (e) Priority 3: 30 (j)	NDMA, S/PDMAs, Chamber of Commerce			X	X
	d. Acquire fresh satellite images using platform of International Disaster Charter which shall be very helpful for quick damage assessment.	Priority 1: 24 (k and f)	SUPARCO and NDMA		X	X	
	e. Organize further trainings in the disaster-prone districts for government officials on MIRA standard format.	Priority 1: 24 (g and i) Priority 2: 27 (a)	NIDM, S/PDMAs and DDMAs		X	X	X
	f. Promote disaster risk financing for humanitarian actions and develop partnerships with various non-government organizations	Priority 3: 30 (b)	NDMA and S/PDMAs	X			
	g. Conducting awareness raising campaigns for the general public utilizing various media such as social media, radio, TV, posters, mosques, and schools	Priority 1: 24 (m) III 19 (k) Priority 2: 27 (a and g)	DDMAs, NIDM, S/PDMAs and NDMA	X	X	X	X
3.1.10. Post Disaster Recovery	a. Documentation of lessons learnt regarding recovery from the flood 2022 and organize workshop/conference	Priority 4: 33 (e and j)	NDMA		X		



3.2 Mechanism of implementation

Each priority strategy has been turned into an action plan which consist of proposed interventions, relevant implementing counterparts and quarter-wise timeline. The plan will be elaborated into national, provincial and district levels plans/strategies set by various departments/organizations mentioned below in the given table. The NDMA shall coordinate with all dealing departments/organizations to monitor progress to ensure the implementation of the proposed interventions. In order to strengthen implementation of the plan, there is need to build a network that will link the government and non-government organizations, financial banks, the private sector, the civil society and other relevant stakeholders to work for developing disaster and climate resilience. Besides local government and targeted communities will be involved at the grass root levels for the implementation of the plan, which shall ultimately help in building the capacities of general public to fight against the disasters in well-coordinated manners.

3.3 Institutional Arrangement

In order to ensure the implementation of proposed interventions at all level, an "NDMP-II Working Group" will be established to monitor progress. The proposed group will be comprising of officers from all relevant department/organizations. Some of key responsibilities of the working groups are as under;

- Provide strategic directions and technical assistance for the implementation of the plan.
- Conduct regular meetings to monitor progress and evaluate the work of all those

organizations involved in the implementation of the disaster management plan. The working group shall hold at least quarterly meetings, and share minutes of the meeting for approval and further necessary directions.

- Plan for mobilizing resources and funds at various Level and conducting donor meetings.
- Coordinate with Federal/Provincial Government Departments, Financial Banks and NDRMF for mobilizing funds and technical resources.

3.4 Financial Arrangement

Funding for the implementation of this plan will be allocated from the National Disaster Management Fund, State/Provincial Disaster Management Funds and other allied counterpart's allocated budget. Considering the government's limited funding capacity, the technical and financial assistance of Financial Banks, National Disaster Risk Management Fund, UN, I/NGOs and private sector will be mobilized.



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^[23] Ranking is extracted from the NDMP-I conducted through consultation workshops at Provincial levels during 2011-2012



List of Annexures

Annexure I: List of Concerned Organizations at National and Provincial Levels

S #	Department	Contact Number
1.	Pakistan Meteorological Department (PMD)	051-9250367 051-9250368 051-9250364
2.	Flood Forecasting Division, Lahore	042-99200208
3.	Army Flood Control Centre, Engineers Directorate	051-5202059 051-5202060 203525 (DEFCON) 8000-30855 (PASCOM)
4.	DG NHEPRN	051-9255708-9
5.	Federal Flood Commission	051-9244604 051-9244616
6.	IRSA, Islamabad	051-9244600 051-9244599
7.	SUPARCO Islamabad	051-9075265
8.	Nullah Lai Control Room	051-9250566
9.	Rescue 1122 Punjab	042-37423372
10.	Rescue 1122 Rawalpindi	051-9291185
11.	Rescue 1122 Khyber Pakhtunkhwa	091-9222483-4
12.	Rescue 1122 Gilgit Baltistan	05811-922137
13.	Rescue 1122 Azad Jammu & Kashmir (SDMA)	0333-3331122
14.	Geological Survey of Pakistan, Islamabad	051-9269579 051-9255141
15.	COMKAR Karachi	021-48506113 021-48501705
16.	Pakistan Maritime Security Agency, Karachi	021-99214624 021-99214625
17.	PCIW (Pakistan Commission for Indus Water) Lahore	042-99212783-86
18.	GM, Pakistan Railway Lahore	042-99201700
19.	Punjab Irrigation Department	042-99212117-8
20.	Balochistan Irrigation Department	081-9201074
21.	Sindh Irrigation Department	021-99222949 021-99222950
22.	Azad Jammu & Kashmir Irrigation Department	05822-921596 05822-921157



23.	KPK Irrigation Department	091-9210845 091-9212116
24.	Civil Defence Punjab	042-99212109 042-99212111
25.	Civil Defence Sindh	021-99243765
26.	Civil Defence KPK	091-9212176 091-2263158-59
27.	Civil Defence Balochistan	081-9201853 081-9201118

Annexure II: Contact Details of NEOCs and PEOCs

S #	Emergency Operation Centers	Contact Number
1.	National Emergency Operation Centre (NDMA) Islamabad	UAN-051-111-157-157 051-9205037
2.	Provincial Emergency Operation Centre (PEOC) Punjab	042-99204408 042-99203163
3.	Provincial Emergency Operation Centre (PEOC) Sindh	021-99332005 021-99332003
4.	Provincial Emergency Operation Centre (PEOC) Balochistan	081-9241133 081-9241118
5.	Provincial Emergency Operation Centre (PEOC) KPK	091-9213867 091-9213845 091-9213855
6.	State Emergency Operation Centre (SDMA) SDMA AJ&K	05822-921536 05822-921643 05822-921101
7.	GBDMA Emergency Operation Centre, Gilgit	05811-922030 920874-75

Annexure III: Basic Concepts used in this Plan^[23]

- **Capacity**

The combination of all the strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience.

- **Disaster**

A serious disruption of the functioning of a community or a society at any scale due to

hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts.

- **Disaster Management**

The organization, planning and application of measures preparing for, responding to and recovering from disasters.



- **Disaster Management Planning**

Participatory disaster management planning is a process in which the community members are involved in analyzing the participatory disaster risk assessment information, towards developing an action plan for disaster risk reduction measures that will help in reducing the prioritized risk of the target communities.

- **Disaster Risk**

The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.

- **Disaster Risk Assessment**

A qualitative or quantitative approach to determine the nature and extent of disaster risk by analyzing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods and the environment on which they depend.

- **Disaster Risk Management**

Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.

- **Disaster Risk Reduction**

Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.

- **Emergency**

Emergency is sometimes used interchangeably

with the term disaster, as, for example, in the context of biological and technological hazards or health emergencies, which, however, can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society.

- **Hazard**

A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.

- **Mitigation**

Lessening or minimizing of the adverse impact of a hazardous event. Mitigation includes undertaking both structural and non-structural measures aimed at reducing the risk from disasters. Structural measures are any physical construction to reduce or avoid possible impacts of hazards, or the application of engineering techniques or technology to achieve hazard resistance and resilience in structures or systems. Non-structural measures are measures not involving physical construction that uses knowledge, practice or agreement to reduce disaster risks and impacts, in particular through policies and laws, public awareness raising, training and education.

- **Preparedness**

The knowledge and capacities developed by the governments, response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters.

- **Prevention**

Activities and measures to avoid existing and future disaster risks.



- **Reconstruction**

The medium- and long-term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for the full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risks. Permanent measures to repair or replace damaged dwellings and infrastructure and to set the economy back on course.

- **Recovery**

The restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster affected community or society, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk.

- **Rehabilitation**

The restoration of basic services and facilities for the functioning of a community or a society affected by a disaster.

- **Relief**

Measures that are required in search and rescue of survivors, as well to meet the basic needs for shelter, water, food & health care. Intervention aimed at meeting the immediate needs of the victims of a disaster.

- **Resilience**

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the

preservation and restoration of its essential basic structures and functions through risk management.

- **Response**

Actions taken directly during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

- **Risk**

The combination of the probability of an event and its negative consequences

- **Vulnerability**

The conditions determined by physical, social, economic and environmental factors or processes that increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.



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Annexure IV: Prioritized Hazards Prone Districts of Pakistan^[23]

Rank	District	Province	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk	PDMA Policy	Total
1	Karachi	Sindh	4	1	5	5	5	5	1	1	5	30
2	Hattian	A.J.K	5	5	5	-	2	3	4	1	5	25
3	Muzaffarabad	A.J.K	5	5	5	-	2	3	5	5	5	25
4	Charsadda	KPK	5	3	5	-	2	3	5	1	5	23
5	Shangla	KPK	5	4	5	-	2	4	5	5	3	23
6	Sawat	KPK	5	5	4	-	2	2	5	5	5	23
7	Nowshera	KPK	5	3	5	-	2	3	4	1	5	23
8	Sudhnoti	A.J.K	5	5	5	-	2	5	1	1	1	23
9	Poonch	A.J.K	5	5	5	-	2	5	1	1	1	23
10	Haveli	A.J.K	5	5	5	-	2	5	5	1	1	23
11	Bagh	A.J.K	5	5	5	-	2	5	5	1	1	23
12	Mansehra	KPK	4	5	4	-	2	1	4	5	5	21
13	Hyderabad	Sindh	5	1	4	-	4	5	1	1	1	20
14	Thatta	Sindh	4	1	2	3	4	1	1	1	5	20
15	Tando Muhammad Khan	Sindh	5	1	4	-	4	5	1	1	1	20
16	Dadu	Sindh	5	1	2	-	2	5	1	1	5	20
17	Qamber & Shahdadkot	Sindh	5	1	3	-	2	4	1	1	5	20
18	Badin	Sindh	4	1	3	-	5	2	1	1	5	20
19	Rawalpindi	Punjab	4	5	5	-	2	3	1	1	1	20
20	Buner	KPK	5	4	4	-	2	4	4	1	1	20
21	Bajaur	KP MERGED DISTRICTS	3	3	5	-	2	2	5	1	5	20
22	Bolan	Balochistan	4	3	3	-	2	3	1	1	5	20
23	Neelum	A.J.K	4	4	4	-	1	2	4	4	5	20
24	Kotli	A.J.K	4	3	5	-	2	5	1	1	1	20
25	Tando Allahyar	Sindh	4	1	4	-	4	5	1	1	1	19

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Rank	District	Province	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk	PDMA Policy	Total
26	Peshawar	KPK	5	3	5	-	2	3	4	1	1	19
27	Mohmand Agency	KP MERGED DISTRICTS	3	4	4	-	1	2	3	1	5	19
28	Jaffarabad	Balochistan	5	1	3	-	2	3	1	1	5	19
29	Matiari	Sindh	5	1	4	-	2	5	1	1	1	18
30	Sheikhupura	Punjab	5	2	4	-	2	4	1	1	1	18
31	Upper Dir	KPK	4	5	4	-	2	2	4	5	1	18
32	Swabi	KPK	5	3	5	-	2	2	5	1	1	18
33	Bannu	KPK	4	2	5	-	2	4	1	1	1	18
34	Abbottabad	KPK	3	5	5	-	2	2	5	1	1	18
35	Khyber Agency	KP MERGED DISTRICTS	3	4	3	-	1	2	3	1	5	18
36	Nasirabad	Balochistan	5	1	3	-	2	2	1	1	5	18
37	Mirpur	A.J.K	3	3	4	-	2	5	1	1	1	18
38	Kashmore	Sindh	5	1	3	-	2	5	1	1	1	17
39	Jamshoro	Sindh	5	1	2	-	3	5	1	1	1	17
40	Jacobabad	Sindh	5	1	3	-	2	5	1	1	1	17
41	Shikarpur	Sindh	5	1	3	-	2	5	1	1	1	17
42	Nawabshah	Sindh	5	1	2	-	3	5	1	1	1	17
43	Naushahro Feroze	Sindh	5	1	3	-	2	5	1	1	1	17
44	Mirpur Khas	Sindh	4	1	3	-	4	4	1	1	1	17
45	Rahim Yar Khan	Punjab	5	1	3	-	2	5	1	1	1	17
46	Multan	Punjab	4	1	4	-	2	5	1	1	1	17
47	D. I. Khan	KPK	5	1	2	-	2	2	1	1	5	17
48	Batagram	KPK	3	4	4	-	2	3	4	5	1	17
49	Mardan	KPK	5	3	5	-	2	1	5	1	1	17
50	Lower Dir	KPK	4	4	5	-	2	1	5	1	1	17



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Rank	District	Province	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk	PDMA Policy	Total
51	Quetta	Balochistan	3	1	5	-	2	5	1	1	1	17
52	Khairpur	Sindh	5	1	2	-	2	5	1	1	1	16
53	Ghotki	Sindh	5	1	2	-	2	5	1	1	1	16
54	Sukkur	Sindh	5	1	2	-	2	5	1	1	1	16
55	Gujranwala	Punjab	5	2	4	-	2	2	1	1	1	16
56	Okara	Punjab	3	1	5	-	2	4	1	1	1	16
57	Nankana Sahib	Punjab	3	2	4	-	2	4	1	1	1	16
58	Muzaffargarh	Punjab	5	1	3	-	2	4	1	1	1	16
59	Mianwali	Punjab	4	4	3	-	2	2	1	1	1	16
60	Gujrat	Punjab	5	2	5	-	2	1	1	1	1	16
61	Haripur	KPK	3	5	4	-	2	1	4	1	1	16
62	Hangu	KPK	3	3	4	-	2	3	1	1	1	16
63	Malakand	KPK	4	3	5	-	2	1	4	1	1	16
64	Islamabad	ICT	2	3	5	-	2	3	1	1	1	16
65	Orakzai Agency	KP MERGED DISTRICTS	2	4	3	-	2	4	1	1	1	16
66	Jhal Magsi	Balochistan	4	1	2	-	2	2	1	1	5	16
67	Bhimber	A.J.K	4	2	3	-	2	4	1	1	1	16
68	Tharparkar	Sindh	3	1	2	-	4	4	1	1	1	15
69	Larkana	Sindh	5	1	2	-	2	4	1	1	1	15
70	Faisalabad	Punjab	3	1	4	-	2	4	1	1	1	15
71	Toba Tek Singh	Punjab	3	1	4	-	2	4	1	1	1	15
72	Sialkot	Punjab	5	1	5	-	2	1	1	1	1	15
73	Sahiwal	Punjab	3	1	4	-	2	4	1	1	1	15
74	Narowal	Punjab	5	1	5	-	2	1	1	1	1	15
75	Jhang	Punjab	5	1	3	-	2	3	1	1	1	15

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Rank	District	Province	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk	PDMA Policy	Total
76	Tank	KPK	4	1	3	-	2	4	1	1	1	15
77	Sibi	Balochistan	3	1	2	-	1	3	1	1	5	15
78	Loralai	Balochistan	3	2	3	-	2	4	1	1	1	15
79	D.G. Khan	Punjab	5	1	2	-	2	3	1	1	1	14
80	Sargodha	Punjab	4	2	3	-	2	2	1	1	1	14
81	Rajanpur	Punjab	5	1	2	-	2	3	1	1	1	14
82	Lodhran	Punjab	3	1	3	-	2	4	1	1	1	14
83	Leiah	Punjab	5	1	2	-	2	3	1	1	1	14
84	Khushab	Punjab	4	2	3	-	2	2	1	1	1	14
85	Khanewal	Punjab	3	1	3	-	2	4	1	1	1	14
86	Kasur	Punjab	3	1	4	-	2	3	1	1	1	14
87	Jhelum	Punjab	3	2	4	-	2	2	1	1	1	14
88	FR Peshawar	KP MERGED DISTRICTS	2	3	3	-	2	3	1	1	1	14
89	Killa Saifullah	Balochistan	3	3	3	-	1	3	1	1	1	14
90	Kech	Balochistan	3	1	1	-	4	4	1	1	1	14
91	Umerkot	Sindh	3	1	2	-	3	3	1	1	1	13
92	Sanghar	Sindh	4	1	2	-	3	2	1	1	1	13
93	Chiniot	Punjab	3	1	3	-	2	3	1	1	1	13
94	Vehari	Punjab	3	1	3	-	2	3	1	1	1	13
95	Pakpattan	Punjab	3	1	3	-	2	3	1	1	1	13
96	Mandi Bahauddin	Punjab	3	1	4	-	2	2	1	1	1	13
97	Lahore	Punjab	3	1	4	-	2	2	1	1	1	13
98	Kohistan	KPK	3	4	3	-	1	1	4	4	1	13
99	Kohat	KPK	3	2	3	-	2	2	1	1	1	13
100	South Waziristan Agency	KP MERGED DISTRICTS	2	2	2	-	1	1	1	1	5	13
101	Bahawalnagar	Punjab	3	1	2	-	2	3	1	1	1	12



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Rank	District	Province	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk	PDMA Policy	Total
102	Hafizabad	Punjab	3	1	3	-	2	2	1	1	1	12
103	Chitral	KPK	3	4	2	-	1	1	2	3	1	12
104	FR D.I. Khan	KP MERGED DISTRICTS	1	1	2	-	1	2	1	1	5	12
105	Kalat	Balochistan	3	3	3	-	1	1	1	1	1	12
106	Pishin	Balochistan	2	1	4	-	1	3	1	1	1	12
107	Awaran	Balochistan	2	1	1	-	3	4	1	1	1	12
108	Bahawalpur	Punjab	2	1	2	-	2	3	1	1	1	11
109	Lakki Marwat	KPK	3	1	3	-	2	1	1	1	1	11
110	Hunza-Nagar	Gilgit-Baltistan	3	4	2	-	1	-	2	3	1	11
111	Diamir	Gilgit-Baltistan	3	4	2	-	1	-	2	3	1	11
112	FR Kohat	KP MERGED DISTRICTS	2	3	3	-	1	1	1	1	1	11
113	Harnai	Balochistan	3	1	2	-	1	3	1	1	1	11
114	Barkhan	Balochistan	3	1	3	-	1	2	1	1	1	11
115	Mastung	Balochistan	2	2	3	-	1	2	1	1	1	11
116	Killa Abdullah	Balochistan	3	1	3	-	1	2	1	1	1	11
117	Khuzdar	Balochistan	3	1	1	-	1	4	1	1	1	11
118	Chakwal	Punjab	2	1	3	-	1	2	1	1	1	10
119	Attock	Punjab	2	2	3	-	1	1	1	1	1	10
120	Skardu	Gilgit-Baltistan	3	3	2	-	1	-	2	3	1	10
121	Gilgit	Gilgit-Baltistan	3	3	2	-	1	-	2	3	1	10
122	Ghizer	Gilgit-Baltistan	3	3	2	-	1	-	2	3	1	10
123	Ghanche	Gilgit-Baltistan	3	3	2	-	1	-	2	3	1	10
124	FR Bannu	KP MERGED DISTRICTS	1	2	2	-	1	1	1	1	3	10
125	North Waziristan Agency	KP MERGED DISTRICTS	2	2	2	-	1	2	1	1	1	10

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Rank	District	Province	Flood Risk	Landslide Risk	Earthquake Risk	Tsunami Risk	Cyclone Risk	Drought Risk	Avalanche	GLOF Risk	PDMA Policy	Total
126	Kurram Agency	KP MERGED DISTRICTS	3	2	2	-	1	1	2	1	1	10
127	Gwadar	Balochistan	1	1	2	1	3	1	1	1	1	10
128	Lasbela	Balochistan	2	1	1	1	3	1	1	1	1	10
129	Ziarat	Balochistan	1	1	4	-	1	1	1	1	1	9
130	Bhakkar	Punjab	3	1	2	-	1	1	1	1	1	9
131	Karak	KPK	2	2	2	-	1	1	1	1	1	9
132	Astore	Gilgit-Baltistan	2	3	2	-	1	-	2	3	1	9
133	Kohlu	Balochistan	2	2	2	-	1	1	1	1	1	9
134	FR Tank	KP MERGED DISTRICTS	1	1	1	-	1	1	1	1	3	8
135	Chagai	Balochistan	2	1	1	-	1	2	1	1	1	8
136	Washuk	Balochistan	2	1	2	-	1	1	1	1	1	8
137	Zhob	Balochistan	2	1	2	-	1	1	1	1	1	8
138	Panjgur	Balochistan	1	1	1	-	1	3	1	1	1	8
139	Nushki	Balochistan	2	1	2	-	1	1	1	1	1	8
140	Kharan	Balochistan	2	1	2	-	1	1	1	1	1	8
141	FR Lakki Marwat	KP MERGED DISTRICTS	1	1	2	-	1	1	1	1	1	7
142	Dera Bugti	Balochistan	1	1	2	-	1	1	1	1	1	7
143	Sherani	Balochistan	1	1	2	-	1	1	1	1	1	7
144	Musakhel	Balochistan	1	1	2	-	1	1	1	1	1	7
145	Indian Illegally Occupied Kashmir	Indian Illegally Occupied Kashmir	-	3	-	-	-	-	-	-	1	4



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