National Disaster Management Authority

National Monsoon Contingency Plan 2024

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NATIONAL MONSOON
CONTINGENCY PLAN
2024

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

Editorial Team

Brigadier Muhammad Umar Chattha
Member (Operations), NDMA

Kazim Rahim
Manager Operations, NDMA

Muhammad Fareed
Dy Manager Operations, NDMA

Lt Col Hammad Rana Sadiq
Director Response, NDMA

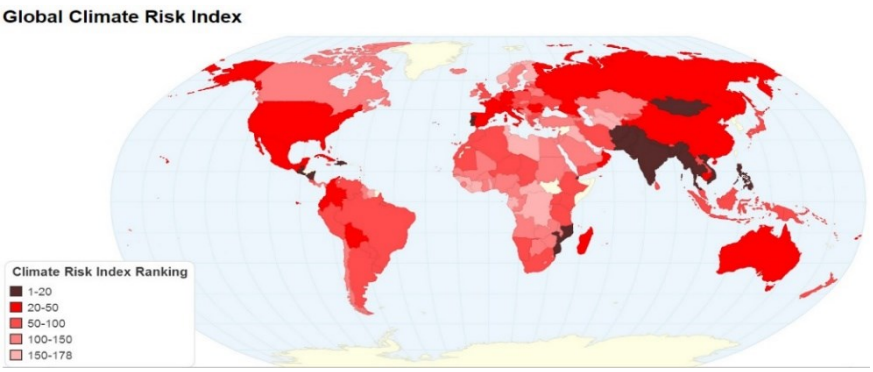
Major Bassar Mumtaz
Dy Director Response, NDMA

**** TO BE READ IN CONJUNCTION WITH NDRP 2024/25 ****

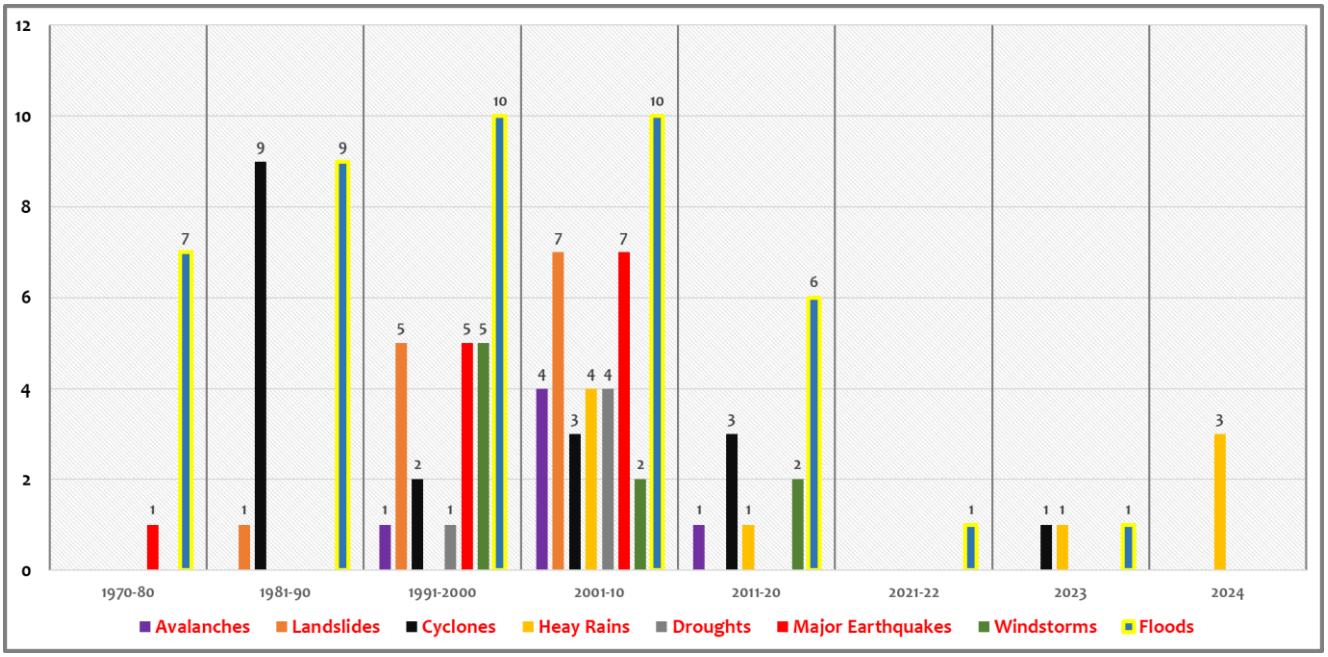
General

1. Pakistan is geographically and topographically a diverse country with high snowcapped and rugged mountains ranges like the Hindukush - Karakorum - Himalayan (HKH) in the north, numerous hill ranges spread throughout the country down to vast plain areas in the centre and deserts in south along with an expansive 1,000 km long coastline. This immense diversity comes at a cost of diverse natural and human induced hazards.

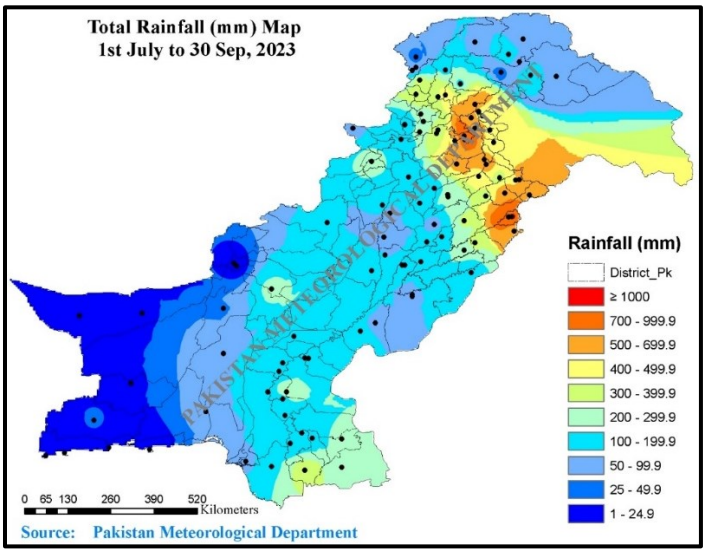
2. Pakistan is the 8th most vulnerable country on the Global Climate Risk Index. Developing countries like Pakistan, and least developed countries, while contributing negligible share to the global emissions, are facing brunt of the climate change impacts. High population density, economic inadequacies and lack of adequate infrastructure add to Pakistan's vulnerabilities.



3. Pakistan, throughout its history, has faced a wide variety of disasters including floods (riverine, flash, urban, glacial lake outburst and hill torrents), earthquakes, heatwaves, droughts, landslides, avalanches, forest fires, cyclones, pandemics and industrial incidents etc. These disasters have caused significant loss of life, property and livelihood as well as social and economic disruption, affecting millions of people across the country. However, over a period of time, learning from past experiences has highlighted the importance of proactive preparedness and planning for effective disaster response. Table below outlines the historical context and trend of natural disasters in Pakistan from 1970 to Spring 2024. Heavy Rains and Flooding are the most recurrent hazard in Pakistan.



4. The annual Monsoon Season, which occurs from July to September in Pakistan, brings varying degrees of rainfall which can predominantly affect Pakistan's northern half. However, in 2023, Pakistan witnessed a departure from the more traditional monsoon pattern which say increased rainfall in Sindh and Western Balochistan. Furthermore, due to excessive rains in the Upper Catchment Areas of Eastern Rivers there was increased flows in River Ravi and flooding in River Sutlej after a historic period of 32 years. Accumulated Total Rainfall Map from 1st July to 30th September 2023 is shown below: -



5. Due to proactive preparedness undertaken by all stakeholders at federal, provincial and local levels and advanced flood warning provided by Flood Forecasting Division (FFD) and Pakistan Commission for Indus Waters (PCIW) timely evacuation of vulnerable and at-risk communities along low-lying areas of River Sutlej were evacuated along with their livestock and personal belongings to safe areas. Through well-coordinated efforts by NDMA, PDMA Punjab, Rescue 1122 Punjab and respective Local Administrations, approximately 424,000 at-risk / vulnerable persons along with 24,500 livestock were evacuated to safe areas until flood waters receded.

6. The National Disaster Management Authority (NDMA) under clause 9(a) and 9(b) of NDM Act 2010 (enclosed at ***Annex-A***) deals with the complete spectrum of disaster management activities in the paradigm of **PR^3** (Preparedness, Response, Recovery and Rehabilitation). Consequent to passage of 18th Constitutional Amendment, DM has been devolved to the provinces and other federating units. Nonetheless, NDMA issues policy guidelines, renders directions and early warnings to various federal and provincial departments and DM agencies to initiate mitigation measures for potential disaster risks and contingency plans for any disaster situation under likely hazards. Accordingly, NDMA has issued the **National Disaster Management Plan (NDMP) 2024** and **National Disaster Response Plan (NDRP) 2024/25**. In the same context, the issuance of **National Monsoon Contingency Plan** is an annual practice, undertaken before the start of Monsoon Season.

7. **"National Monsoon Contingency Plan 2024"** has been prepared in coordination with all disaster management stakeholders from federal to provincial levels. It is based on analysis of seasonal forecast by NDMA Tech Team and Pakistan Meteorological Department (PMD) and likely impact of climate change. The plan lays down guidelines for all disaster management tiers and stakeholders for proactive preparations, measures for mitigation against likely hazards, preparedness for most probable to worst-case scenarios and mounting an effective and timely response against likely hazards / emergencies during Monsoon Season 2024. In this regard, the National Disaster Management Authority (NDMA) actively engaged all relevant stakeholders to provide updates on ongoing preparatory and mitigation measures for the upcoming Monsoon season.

Aim

8. To formulate national contingency and response guidelines for all disaster management stakeholders at national and provincial / state levels for proactive and inclusive preparedness and effective response to any flood like situation as per contingencies based on Monsoon Seasonal Outlook 2024 and other likely emergencies in the country.

Scope

9. The Plan shall encompass following: -

a. **Part I - Organisational Responsibilities**

(1) Responsibility Matrix for Flood Management.

(2) Salient Aspects.

(3) Lessons Learned and Way Forward

b. **Part II - Seasonal Outlook and Scenarios**

(1) Monsoon Seasonal Outlook 2024.

(2) Perceived Impacts of Monsoon Outlook 2024.

(3) Monsoon Season 2024 Contingencies.

(4) Provincial / District Hazard, Vulnerability & Flood Inundation Maps.

(5) Flood Routing Map (Lag time) and Structural Limits.

c. **Part III - National Guidelines for Monsoon 2024**

(1) Preparedness Phase.

(2) Response Phase (Rescue and Relief).

(3) Early Recovery Phase.

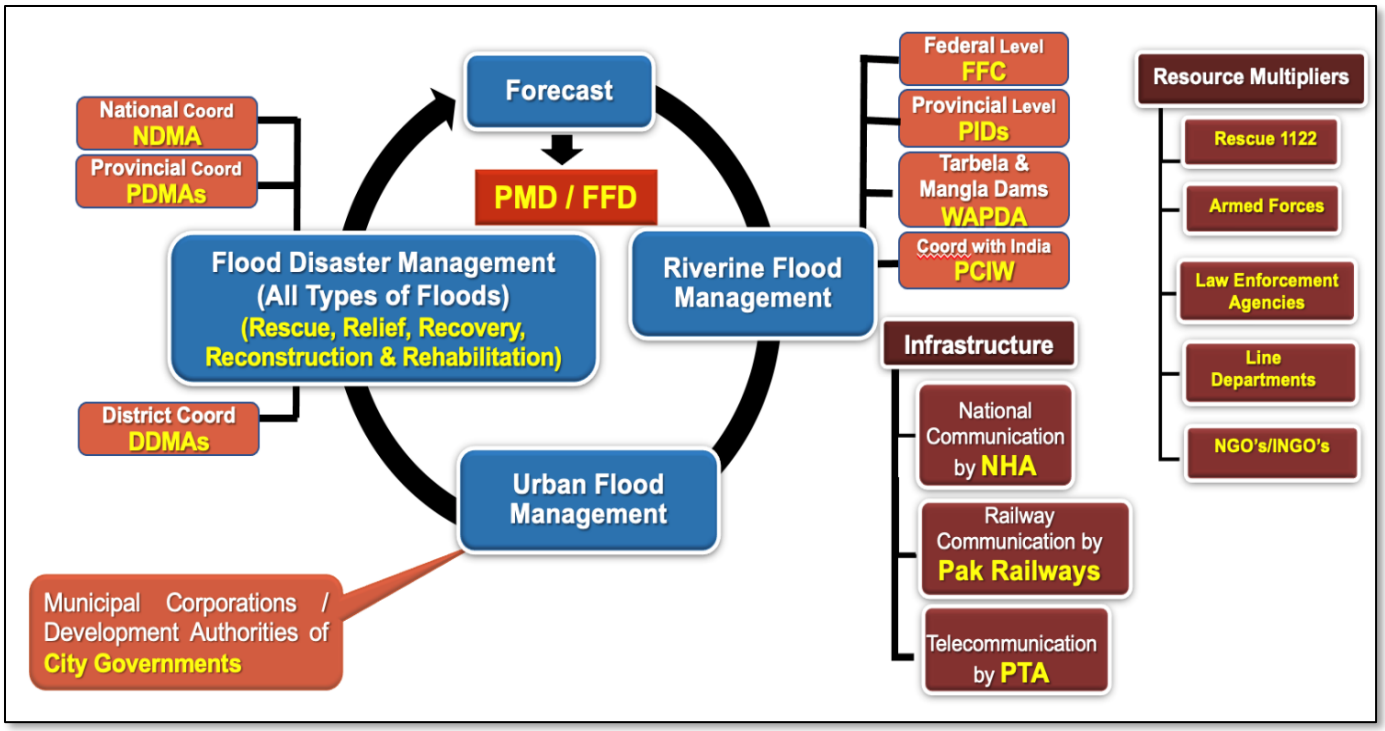
(4) Coordination Aspects.

(5) Logistical Considerations.

PART I - ORGANIZATIONAL RESPONSIBILITIES

Responsibility Matrix for Flood Management

10. Responsibility matrix explains the sequence of actions and responsibilities by various stakeholders in line with their tasks and functions for effective flood management. The activities under the contingency plan trigger as soon as forecast / advisory is issued by PMD / FFD / FFC / PCIW based on the weather forecast / river flow data, followed by which advisory / guidelines are issued by NDMA. These roles and responsibilities of all relevant stakeholders have been clearly laid down in the **NDMP 2024, NDRP 2024/25** and **National Monsoon Contingency Plan** issued on regular / seasonal basis. Figure below represents the sequence of actions by different stakeholders and the overall paradigm of responsibility matrix: -



Salient Aspects

11. In addition to the specific mandates of federal and provincial departments, it is important to highlight the salient aspects of the concerned departments, which are as follows: -

a. **Pakistan Meteorological Department (PMD).** To monitor weather patterns developing in the region and around the globe, assess their likely impact on Pakistan and issue a forecast highlighting impact for the different regions of the country. The forecast will be issued on need basis under normal circumstances and daily during any large / potentially significant weather system impacting the country.

b. **Flood Forecasting Division (FFD).** To monitor and forecast river flows and issue regular reports including likely impacts in different regions. The reports will cover major reservoirs, riverine and hill torrent regions of the country.

c. **Federal Flood Commission (FFC)**. To coordinate and implement National Flood Protection Plan through concerned provincial and federal line agencies, provide guidance for national level coordination and issue directions to all concerned provincial and federal departments for managing flood water through dams, hydraulic structures, canals and protective works.

d. **Ministry of Water Resources**. Plan and establish mechanism for streamlining coordination between FFC, WAPDA and PIDs for flood management and provide guidelines to all stakeholders for implementation of the National Water Policy by taking all stakeholders on board.

e. **Water and Power Development Authority (WAPDA)**. Ensure activation of reservoir management committees, with involvement of all stakeholders for regulation of all reservoirs for effective flood management. The committees must operate in line with the directions issued by federal bodies and plan in light of the forecasts issued.

f. **Provincial Irrigation Depts (PIDs)**. To work in close cooperation with FFC, Reservoir Management Authorities, Army Engineers and District Administrations to ensure effective operation of hydraulic structures, canals and flood protection works including operation of breaching sections as and when required to ensure public safety.

g. **DDMAs / Local Administrations**. Being the 1st tier responders, carryout assessment of respective regions and formulate plans to address the vulnerabilities identified. Coordinate with all relevant stakeholders for comprehensive flood response and develop capacities to meet local challenges. Enforce removal of encroachment from nullahs, canals and rivers etc to preclude risks arising from likely floods. Comprehensive plans be prepared, catering for respective vulnerabilities, to enable effective mitigation and coordination for rapid response against seasonal contingencies.

h. **Municipal Corporations / Line Departments**. Respective authorities to work in close coordination with line departments to ensure timely cleaning of storm water drainage system and nullahs. Conduct audits of machinery and manpower before onset of monsoon season to meet the gaps identified.

i. **Pakistan Commission for Indus Waters (PCIW)**. Coordinates with India on the timely sharing of river flows / dam discharge data during monsoon season of the three Eastern Rivers (Ravi, Sutlej and Beas) and the three Western Rivers (Indus, Jhelum and Chenab) have been allocated to Pakistan.

j. **Pakistan Telecommunications Authority (PTA)**. Coordination with Cellular Mobile Operators (CMOs) and other telecom operators for timely maintenance / restoration of telecom infrastructure affected by disasters and the dissemination of SMS alerts for at-risk / vulnerable communities.

k. **Ministry of Communications**. To help enable and augment the capacity of NHA in restoration of connectivity and aid in coordination between relevant stakeholders including NHA, respective PHAs and C&W Departments.

l. **MoNHS&R**. To coordinate with National Institute of Health (NIH) and respective provincial health departments and provide support to national health system for tackling emergent / likely health needs.

m. **Ministry of Railways**. Ensure adequate preparations against likely seasonal hazards and undertake maintenance / restoration of railways communication infrastructure in the aftermath of monsoon emergencies.

n. **MoNFS&R**. Coordinate with provincial agriculture departments to establish a coordinated mechanism for safeguarding crops from potential floods, thereby fulfilling the responsibility of ensuring food security and minimizing the impact on agricultural production.

o. **PEMRA**. Enforcement and regulation of electronic media in order to ensure factual information is shared with the general public on monsoon floods.

p. **PDMAs / SDMA / GBDMA / ICT Administration**. As 2nd Tier responders, in addition to having overall mandate for DM in respective regions, ensure coordination with all relevant stakeholders for planning, implementing mitigative policies and developing well-coordinated response against likely Monsoon emergencies. 2nd Tier to ensure the following: -

(1) Profile regional vulnerabilities/ risks through conduct of MHVRAs.
(2) Archive hazards to develop accurate database for reference in future planning.
(3) Ensure adequate relief stockpiling.
(4) Conduct audits for preparedness measures (HR and machinery).
(5) Plan and conduct mock exercises to enhance DM stakeholder coordination.
(6) Establish region-specific awareness campaigns.
(7) Establish and operate Early Warning Systems.
(8) Generate timely situation reports (SITREPs).
(9) Develop and update contingency plans on annual and seasonal basis.
(10) Facilitate effective rehabilitation and recovery effort.

q. **Rescue 1122**. To ensure expedient provision of emergency rescue services including lifesaving first aid and ambulance service in any emergency situation. Plan and conduct rescue operations in coordination with local administrations / DDMAs, provincial authorities and Armed Forced, if required.

r. **Police Services / LEAs**. To ensure provision of security and safety to disaster affected areas by securing private / public property and also provide safe and secure working environment to different agencies / NGOs etc working the affected areas.

s. **Armed Forces / CAFs**. Ensure assistance to civil administration by providing support in emergency rescue, evacuation, relief and medical support in disaster affected areas, once requisitioned.

t. **INGOs / NGOs / CSOs**. To ensure provision of humanitarian assistance and emergency relief support to disaster affectees through provision of shelter, food packages and medical support in coordination with NDMA / PDMAs / DDMAs.

u. **NHA / FWO**. Devise a detailed plan for timely maintenance and restoration of national highways and motorways infrastructure in light of likely Monsoon emergencies with special focus on the areas / sections which were affected / damaged during the floods 2022.

v. **Provincial Highway Authorities**. Coordinate with various contractors for the maintenance & restoration of respective provincial highway infrastructure in the aftermath of disaster situation.

w. **Communication and Works Departments of Provinces / GB / AJ&K and ICT**. Employ respective resources and establish Coordination with various contractors for the maintenance & restoration of respective provincial and rural access road infrastructure in the aftermath of disaster situation.

x. **SUPARCO**. Provide overall situation and damage assessment using satellite technology on required basis.

Lessons Learned and Way Forward

12. In order to facilitate advancement and capacity building of the disaster management system, it is imperative to ensure lessons are learnt from past experiences. Pakistan's disaster management system has benefited in the past from implementing valuable changes derived from lessons learnt, i.e. 2010 Floods. Likewise, during the Monsoon Season and ensuing Floods of 2022, various challenges were encountered by all stakeholders at different levels, providing valuable opportunities for learning and improving the disaster management system in the country. The following lessons were identified along with measures to be taken for all concerned: -

a. **Weather / River Flow Monitoring**

(1) Ensure improved coverage of weather monitoring stations, particularly in far-flung or isolated areas such as Balochistan, Khyber Pakhtunkhwa, Gilgit Baltistan and AJ&K to enhance our ability to monitor weather patterns effectively.

(2) Install gauges / sensors / monitoring mechanisms in areas prone to rain-induced hazards like flash floods, hill torrents, landslides, catchment areas of reservoirs / barrages, near bridges and major urban cities' drainage systems. This will enable us to better understand and respond to potential risks.

(3) Address the challenges posed by shifting or erratic weather patterns in regions traditionally experiencing heavy rainfall.

(4) Improve the availability of transboundary river flow data to better understand its impact on our river systems.

(5) Enhance river flow gauge network to provide timely warnings about potential flood build-up, allowing for more effective response measures.

(6) Establish automated and networked gauges for real-time data dissemination, reducing time delays in receiving water flow and precipitation information.

(7) Update riverbed data to reflect on-ground changes and modifications to river cross sections. Currently, the time lag of riverbeds does not cater for on-ground intrusions into riverbeds and change in available river cross section data.

b. **Check / Dispel Unauthorized Weather Reporting**

(1) Foster collaboration among different organizations, such as PMD, WASA and private weather channels on social media, to ensure consistent and coordinated rain data and weather situation updates. This will minimize confusion among the public and concerned departments by eliminating inconsistent reporting from different sources.

(2) Integrate data from private weather monitoring stations into the national network to enhance the accuracy and coverage of weather information.

(3) Clarify legal responsibilities for issuing warnings and their dissemination to strengthen the operationalization of the flood early warning system.

c. **Lack of Centralised Disaster Management Database**

(1) Develop a micro-level multi-hazard vulnerability and risk mapping system for the country to enable informed decision-making and targeted disaster management efforts.

(2) Collect and maintain comprehensive data on qualified professionals who can be utilized for effective disaster management in the country.

d. **Legal Framework / Responsibility**

(1) Enhance the implementation of approved fire safety and seismic compliant building codes.

(2) Establish clear responsibilities for different aspects of early warning systems, promoting coordination and sustainability.

(3) Enforce existing laws and regulations, such as the River Act, to expedite the clearance of encroachments in waterways.

(4) Regulate the construction of private bunds to prevent ponding and flooding by ensuring the free flow of water.

(5) Implement appropriate regulations to discourage housing societies and constructions near water flow paths, including nullahs, check dams and reservoirs, to minimize risks to human life.

(6) Enforce the Planning Commission DRR Checklist for development projects to address long-term issues related to water drainage, especially around vulnerable points like bridges.

(7) Improve the enforcement of PEMRA rules on accurate reporting and responsible coverage of disasters and emergencies by media outlets. This will eliminate false / misreporting and sensationalism of disasters by media outlets.

e. **Advisories / Alerts - Acceptance and Mediums Utilised**

(1) Promote public awareness and engagement regarding weather forecasts and early warnings to overcome public apathy. Encourage communities to follow emergency evacuation orders and ensure regular community drills.

(2) Simplify weather forecasts and early warning messages, using regional languages and vocabulary accessible to the public, to help at-risk communities to comprehend warnings / risks.

f. **Reservoir Management**

(1) Prioritize de-silting of reservoirs and dams of all sizes to increase their capacity and prevent early discharge and overflowing. Any reservoir specific issue which prevents such a measure should be highlighted and shared with FFC and NDMA.

(2) Implement effective maintenance practices for dams, especially small and check dams, to avoid damages and failures during the monsoon season.

(3) Address the issue of check dams and settlements by locals in transitional waterways through proper planning and regulation to ensure the smooth flow of water.

(4) FFC to coordinate with all concerned for making annual plans of reservoir audits and their reports be presented to FFC/ NDMA for information of PMO.

g. **Documentation of Operations**. Ensure frequent archiving and emphasize the importance of maintaining written/ soft copy records regarding rescue and relief operations undertaken by rescue services / armed forces. This will facilitate future analysis and improve coordination, especially when allocating resources to a particular operation.

h. **Duplication of Relief Efforts**. Strengthen coordination and information-sharing between the government(s) and INGOs / NGOs operating in affected areas to avoid duplication of relief efforts. Establish mechanisms for integrated planning and distribution of relief items to ensure equitable coverage and avoid certain areas being left under catered.

i. **Redundancy in Communication Infrastructure**. Address the issue of limited redundancy in communications infrastructure to prevent extended periods of mobile cellular or landline telephone service disruptions in flood-affected areas. Explore alternative communication methods or backup systems.

j. **Capacity Building at District Levels**. Enhance the capacity of DDMAs by providing dedicated human resources and sufficient funding. Promote training and skills development for disaster management personnel at the district level.

k. **Update Breaching Sections**. Update and demarcate breaching sections along major rivers to reflect changes caused by urbanization and development. This will ensure accurate understanding and management of water flow patterns since existing demarcation dates back 20-30 years and has become obsolete.

l. **Address Illegal / Unauthorize Embankment Breach**. Take strict measures to prevent illegal or unauthorized bund breaches that result in flooding in rural areas. In addition, enhance monitoring and enforcement efforts to safeguard vulnerable communities.

m. **Improve Water Drainage in Low-Lying Areas**. Develop effective drainage systems in low-lying areas prone to recurring water inundation. Learn from past flood experiences, such as those in 1976, 1992 and 2010 to implement appropriate measures and minimize risks.

n. **Encroachments in River / Nullah Beds**. Settlements and encroachments in river / nullah beds and drainage systems of major cities pose a serious threat of urban flooding and challenges for rescue and relief efforts during Monsoon emergencies. It is imperative that urgent attention be paid to pre-Monsoon removal of encroachments of nullahs / drains.

o. **Insufficient Desilting / Cleaning of Nullahs**. Inadequate desilting of nullahs exacerbates the vulnerability to monsoon emergencies as it obstructs proper water flow, leading to potential urban flooding. It is imperative to prioritize and execute comprehensive desilting operations of nullahs to optimize drainage capacity, minimize flood risks, and enhance resilience against heavy rainfall events during Monsoon season.

p. **Timely and Verified Reporting**. Establish protocols for prompt and verified reporting of incidents, ensuring appropriate diligence, to prevent delays in issuing ex-gratia compensation to affected individuals.

q. **Non-Availability of Dedicated Aviation Assets**. Aviation assets of Armed Forces and Ministry of Interior are employed for rescue and relief efforts nation-wide. However, in light of recent disasters i.e. Floods 2022, a need for dedicated aviation assets for disaster management / response needs has been highlighted.

PART II - SEASONAL OUTLOOK AND SCENARIOS

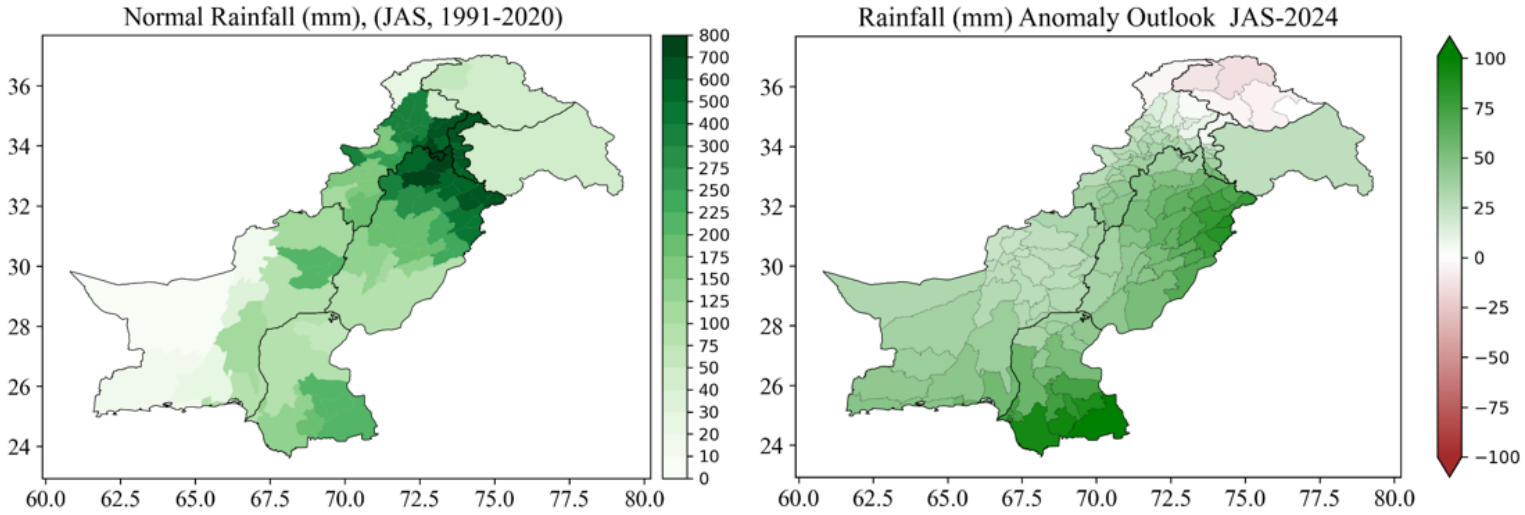
Monsoon Seasonal Outlook 2024

13. According to Monsoon Seasonal Outlook 2024, and 28th Session of South Asian Climate Outlook Forum (**SASCOF-28**) Seasonal Climate Outlook over South Asia for 2024 Southwest Monsoon Season **June to September**, it is anticipated that **Neutral Phase** of climate indicators such as the **El Niño Southern Oscillation (ENSO)** will shift towards the **Negative State (La Niña) whereas** the **Indian Ocean Dipole (IOD)** is forecasted to persist in a **Positive Phase**. Based on the global and regional circulation patterns, the Seasonal Outlook for Pakistan is as under: -

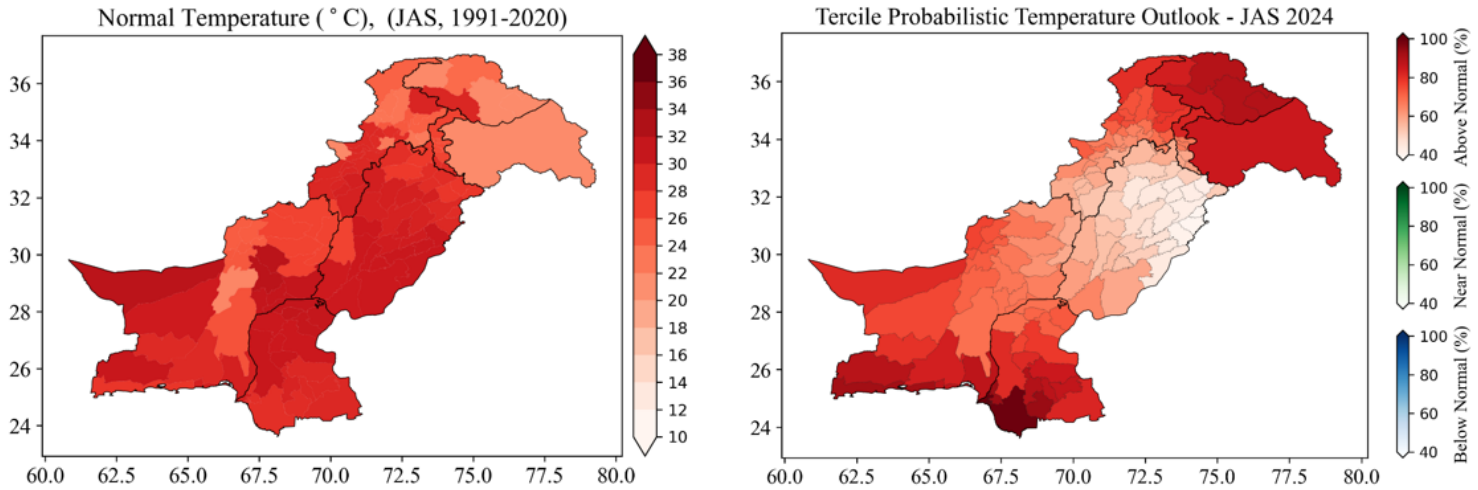
a. The climatic conditions indicate **Above Normal Rainfall** expected in most parts of Pakistan whereas **Normal Rainfall** to be expected elsewhere.

b. Nationwide min-max temperatures are expected to be **Above Normal** throughout the country.

c. Most **significant temperature deviation** is expected over Northern Khyber Pakhtunkhwa, Gilgit Baltistan, State of AJ&K, Southern Balochistan & Sindh.



Map 1: Normal Rainfall (JAS 1991-2020) and Rainfall Outlook (JAS-2024)



Map 2: Normal Temperature (JAS 1991-2020) and Tercile Probabilistic Temp Outlook (JAS-2024)

Perceived Impacts of Monsoon Seasonal Outlook 2024

14. Under the influence of predicted climatic and hydro-meteorological conditions, the following impacts are envisioned to occur: -

a. **Higher temperatures**, in Khyber Pakhtunkhwa, Gilgit Baltistan, State of AJ&K and Upper Catchments **may increase snow & ice melt**, thereby increasing chances of **greater inflow for Reservoirs / Indus-basin**.

b. Due to **higher temperatures** and **rainfall**, Upper Khyber Pakhtunkhwa and Gilgit Baltistan may be **susceptible to GLOFs**.

c. **Above Normal rainfall** may be **beneficial for agriculture** / irrigation, however **excessive rainfall** may pose risks to agriculture.

d. **Increased rainfall** in Upper Catchments of All Rivers (Indus, Jhelum, etc), especially Eastern Rivers (in India) may lead to increased flows downstream in Rivers Chenab, Ravi and Sutlej.

e. In light of **isolated / extreme climatic conditions / heavy falls**, there is a likelihood of following: -

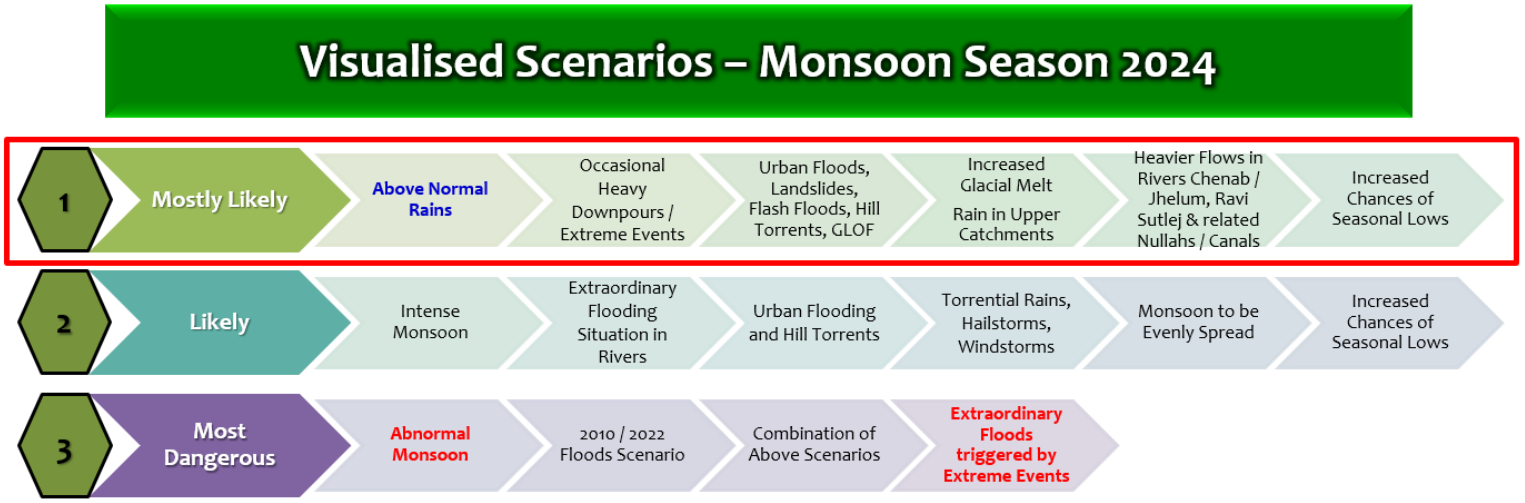
(1) **Flash flooding** in vulnerable hilly / mountainous areas of Balochistan, Khyber Pakhtunkhwa, Upper Punjab, Gilgit Baltistan and State of AJ&K.

(2) **Hill torrents** in vulnerable areas of Eastern Balochistan, South Khyber Pakhtunkhwa and South Punjab.

(3) **Scattered / isolated dust-wind / thunderstorms along with hailstorms** may **cause damage to crops and property**, especially in Balochistan, Khyber Pakhtunkhwa, Punjab and Sindh.

(4) **Extreme hydro-meteorological events, i.e. Torrential / Heavy Rainfall cannot be ruled out** and are likely to generate **heavy flows** leading to **riverine / flash / urban floods** and **hill torrents**.

Monsoon 2024 Contingencies



15. **Visualised Contingency Scenarios**. Monsoon's visualised contingency scenarios, derived from Monsoon Seasonal Outlook for Monsoon 2024 are as under: -

a. **Scenario- 1 (Most Likely) – Above Normal**. It may unfold as under: -

(1) Most regions, across the country will experience **Above Normal Rains**.

(2) **Increased snow / ice melt** expected and resultantly **higher flows in all rivers** will be experienced.

(3) **Extreme weather patterns** i.e. torrential / heavy rains, hailstorm, windstorms may develop during the season and are to be expected across the country.

(4) **Urban flooding in metropolitans will be possible** under climate induced heavy precipitation, which is expected.

(5) Northern Regions i.e. Northern KP and GB will be **prone to development of glacial lakes hence triggering GLOFs**.

(6) Increased chances of Seasonal Lows.

b. **Scenario-2 (Likely) - Intense Monsoon**. This probable scenario may consist of events such as very heavy isolated downpours coupled with higher temperatures, unpredictable release of water from Indian reservoirs along with forced release of water from own reservoirs, create a scenario for riverine flooding. It may unfold as below: -

(1) **Extraordinary riverine flood conditions** triggered by extreme events.

(2) **Urban flooding** due to torrential / heavy downpours in short time span.

(3) **Peak flood conditions** may exist particularly in eastern rivers affecting areas of Punjab and Sindh.

(4) Increased chances of Seasonal Lows.

(5) Common possibility (Urban flooding, landslides, flash floods & GLOF) emerges as a phenomenon in cities / regions prone to such hazards.

c. **Scenario-3 (Most Dangerous) - Abnormal Monsoon**

(1) Combination of **Scenarios 1, 2, 3** and similar to floods experienced in past; 2010 and 2022.

(2) Extraordinary flood conditions triggered **by extreme climatic change** induced events.

(3) High water levels in major water reservoirs.

(4) Common possibility (Flash floods, Riverine Floods, Urban flooding, landslides, avalanches, & GLOF) emerges as a **more frequent and recurrent** phenomena to a high degree in cities / regions prone to such hazards.

(5) **Massive inundation** may be experienced, especially in low lying areas of Balochistan, South Punjab and Sindh.

Provincial / District Hazard, Vulnerability and Flood Inundation Maps

16. NDMA Tech Team has prepared Hazard and Vulnerability Maps, Flood Inundation Maps and Flood Projection Maps which are essential part of preparedness. These maps are created on the basis of historical data of affected areas, extent of damage, population density and housing units. It indicates different hazard zones (Very High, High, Medium, Low and Very Low) that have been identified after detailed analysis. These maps are attached as **Annexes B – L**.

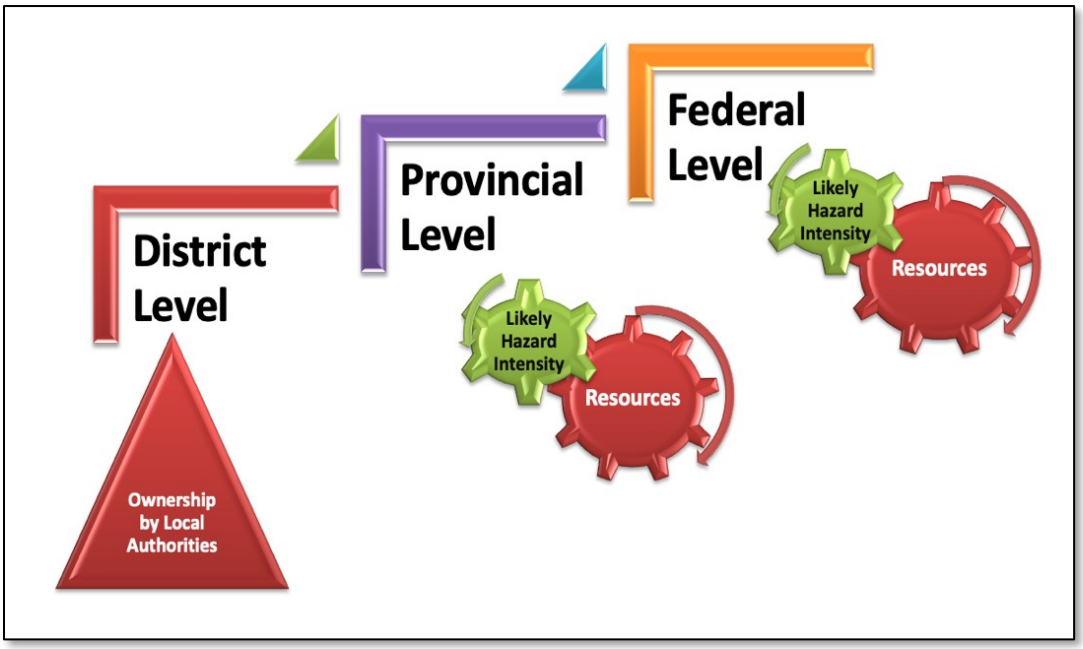
FFD Flood Routing Map (Lag time) and Structural Flood Limits

17. Flood lag times and Structure Flood Limits as per FFD are shown in routing model attached as **Annex M** and **Annex N** respectively.

PART III - NATIONAL GUIDELINES FOR MONSOON 2024

Overview of Disaster Management Structure

18. The National Monsoon Contingency Plan Response Guidelines have been developed with a focus on addressing structural challenges in response mechanism and drawing from lessons learned during previous floods, particularly Floods of 2022. National response to monsoon-related disasters is organized into three tiers: -



Three-tiered Response Mechanism Following Bottom-Up Approach

19. **Anticipatory Actions for Response**. The following section will outline the anticipatory actions for the three phases of response (Preparedness, Response (Rescue & Relief) and Early Recovery) activities which are to be proactively undertaken at Federal, Provincial and Local Levels by all concerned stakeholders. These measures have been developed over a period of time taking into account lessons learned and best practices at all three levels of the disaster management system.

Preparedness Phase Anticipatory Actions

20. The following guidelines serve as a roadmap for all stakeholders, emphasizing the importance of proactive planning and readiness. While these guidelines cover general preparedness actions, detailed plans from each level of governance will outline specific measures for comprehensive readiness. Stakeholders are advised to tailor these guidelines to local / regional contexts to strengthen preparedness efforts and establish a robust framework for risk mitigation.

a. **General Mitigation and Preparedness Measures**

(1) **Vulnerability and Risk Assessment**. Undertake comprehensive assessment of at-risk regions to evaluate vulnerabilities and formulate location-specific preparedness and response plans.

(2) **Updating District Hazard Maps**. District hazard maps to be updated down to union council level to identify the most vulnerable communities for sensitization, awareness, early warning and evacuation in emergencies. Pay particular attention to the following: -

(a) **Riverine Floods**. Identify settlements / encroachments inside river plains (*kacha* areas), communities living close to riverbanks and vulnerable sections identified by respective irrigation departments.

(b) **Flash Floods**. Identify settlements closer to / inside water courses.

(c) **Landslides / Avalanches / GLOFs**. Identify communities residing near dangerous slopes / potential landslide areas in mountainous regions.

(d) **Urban Flooding**. Identify low-lying areas prone to inundation in congested city centres.

(3) **Resource Mapping**. Prepare resource allocation based on distribution of existing resources / manpower deputed and assess if they are fit / sufficient to meet respective risks / vulnerabilities. PDMAs to ensure resource mapping of volunteers, NGOs / INGOs, UN agencies, trained responders, required equipment / machinery at district and preferably at tehsil level to help identify available resources for effective coordination and response.

(4) **Prepositioning of Earth Moving Machinery**. Respective governments, NHA, Communication and Works Departments and other relevant organizations should preposition dedicated earth moving machinery in landslide / flood-prone highways, link roads and isolated mountainous areas of KP, AJ&K and GB. This includes arrangements for bailey bridges and an increased number of maintenance teams at risk-prone locations. Details of critical sections must be covered in contingency plans for respective departments.

(5) **Completion of Mitigation Projects**. Ensure timely completion of ongoing mitigation projects within the specified timeframe to safeguard lives and infrastructure.

(6) **Repair Infrastructure**. Damaged infrastructure be repaired, and shortage of pitching store reserves be recouped and pre-positioned at safe locations. Repair and maintenance of leftover flood protection works should be

completed immediately / before onset of monsoon, FFC to coordinate and share detailed reports on processes completed by respective departments.

(7) **Inspection / Monitoring of Flood Protection Works**. Round the clock vigilance of vulnerable sections of flood protection structures / bunds, identified by respective irrigation departments be ensured through irrigation staff, police / LEAs, civil defence and local community volunteers. Incomplete flood protection works, if any, will be particularly kept under special watch by respective PIDs / PDMAs / DDMAs.

(8) **Dam / Reservoir Operations**. Efficient coordination among all stakeholders, in accordance with revised instructions and Standard Operating Procedures (SOPs) of dams and reservoir management is crucial to ensure timely response and preparedness.

(9) **Location of Relief Camps**. Earmark locations for relief camps and make necessary administrative arrangements based on needs and past experiences. Ensure that relief camps are accessible and located close to main arteries for efficient delivery of relief goods to affected people.

(10) **Updation of Flood Contingency Plans**. All concerned stakeholders should update their flood contingency plans based on NDMA's National Monsoon Contingency Plan 2023 and respective SOPs of the planning process. These updated plans should be shared with NDMA and relevant stakeholders immediately.

(11) **Planning for Vulnerable Groups**. Planning for the needs and concerns of vulnerable groups should be based on available authenticated gender, age and disabled disaggregated data at district level. Ensure inclusive preparedness measures to address specific requirements of vulnerable populations.

(12) **Special Conferences**. Conduct specialized conferences of all relevant stakeholders to discuss preparations and comprehensive response measures to facilitate a well-coordinated response in case of extreme events and assist in timely decision-making processes.

(13) **Conduct Mock Exercises**. Plan and execute mock exercises involving all relevant stakeholders and local communities. Simulate disaster scenarios to streamline response strategies, identify gaps and improve overall preparedness.

(14) **Audit**. Conduct a comprehensive audit of equipment, machinery and trained manpower to identify gaps and initiate measures to meet essential preparation

requirements. Ensure preparedness for effective disaster response for seasonal hazards.

(15) **Provision of Timely Information**. PDMAs to ensure timely provision of accurate and relevant information regarding incidents and response, utilize NDMA's Standardised SITREP format (**Annex I**) for reporting and enhance incident reporting mechanisms for increased efficiency.

21. **Hazard-Specific Preparedness Measures**. Following preparedness measures based on past experiences will help to mitigate losses incurred during floods: -

a. **Riverine and Urban Flooding**

(1) Identification of low-lying areas prone to pondage and inundation in congested areas of the metropolis.

(2) Strengthening the understanding of flood risk management, floodplain regulations and effective urban planning through capacity building efforts for Municipal Corporations and line departments.

(3) Implementation of necessary measures such as widening, dredging and de-silting of storm water and sewerage drains to maintain their functionality and reduce the risk of urban flooding.

(4) Removal of encroachments along floodplains and drains to reclaim the original extents of water flow, facilitating unobstructed drainage and preventing waterlogging in urban areas during heavy rainfall events.

(5) Regular assessment and maintenance of serviceability and operability of pumping stations responsible for managing stormwater and sewage disposal, establishing robust maintenance protocols and contingency plans.

(6) Training and refresher programs for technical manpower involved in flood management and drainage operations to enhance their skills and knowledge.

(7) Provision of reliable backup electricity arrangements, such as generators for sewage disposal and pumping stations / de-watering pumps to guarantee uninterrupted operation during power outages, enabling efficient drainage and sewage management during flood events.

(8) Establishment of dedicated committees at the municipal level, particularly in major cities, responsible for planning and implementing contingency plans, involving relevant stakeholders and experts / volunteers for a coordinated and proactive approach to flood preparedness / response in urban areas.

b. **Flash Floods**

(1) Awareness drive for local communities based on historical data and vulnerability mapping.

(2) Long-term plans for rehabilitation of populations at risk of flash floods.

(3) Commissioning of emergency services such as Rescue-1122 in mountainous and inaccessible regions. As an interim measure, plan for forward placement of emergency services manpower and relief stores.

(4) Installation of signposts along waterways in regional language for community awareness. These signposts should clearly indicate the threat level of waterways, provide information on protective measures and include contact information of relevant authorities.

(5) Implement special community-based vigilance measures during dark hours and periods of intense rains, utilizing sirens or loudspeaker announcements from mosques.

(6) Strengthen early warning systems to provide timely and accurate information about potential flash floods.

(7) Conduct regular maintenance of drainage systems and infrastructure to ensure efficient water flow and reduce the risk of flash floods.

(8) Enhance coordination and communication between relevant agencies, DM authorities and local communities to facilitate prompt response and evacuation during flash flood events.

(9) Implement land use planning and zoning regulations to restrict human settlements in high-risk flash flood areas.

(10) Promote construction of flood-resistant infrastructure and buildings in flash flood-prone regions.

(11) Provide training and capacity building programs for emergency response teams and volunteers to enhance their readiness and effectiveness in managing flash flood situations.

c. **Glacial Lake Outburst Floods (GLOFs)**

(1) Conduct regular monitoring of glacial lakes by relevant authorities (SUPARCO / PMD) to identify vulnerable glacial lake sites / discharge levels before onset of monsoon.

(2) Install early warning systems at GLOF sites that integrate real-time data monitoring, remote sensing and weather forecasting to monitor key indicators and promptly alert authorities / communities about potential GLOF events.

(3) Develop hydrographs along water channels downstream to predict and understand GLOFs more accurately. This will provide crucial information for effective planning and response strategies.

(4) Construct adequate trapping dams with capacity to reduce force and volume of floodwaters to mitigate potential damage to downstream areas and infrastructure.

(5) To prevent lake outbursts, under mentioned civil engineering interventions may be considered. Application of these measures will have to be considered from case-to-case basis: -

(a) Reinforce moraine dams using techniques such as concrete cementing and gabion walls to prevent overtopping of lake water.

(b) 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, utilizing siphon systems, electrical pumping or controlled blasting.

(6) Utilize geospatial technologies / remote sensing to create accurate and up-to-date hazard vulnerability maps, providing valuable insights into the potential impact of GLOFs on surrounding communities and infrastructure.

(7) Conduct awareness campaigns / community training programs to enhance the preparedness and resilience of local communities, educating them about risks and necessary protective measures.

(8) Establish safe evacuation routes and designated assembly points for affected communities, considering the topography and accessibility of at-risk areas. Conduct regular drills / rehearsals to test the effectiveness of evacuation plans and ensure coordinated responses during GLOF emergencies.

(9) Plan for the permanent relocation of settlements located in high-risk areas prone to GLOFs. Simultaneously, focus on constructing disaster-resilient infrastructure based on thorough hydrological studies.

(10) Foster international cooperation and knowledge exchange in GLOF risk management, leveraging experiences and best practices from other countries in GLOF monitoring, mitigation and response.

d. **Landslides / Avalanches.** The vulnerability to landslides and avalanches is influenced by the geography of an area and local climatic conditions, and it is crucial to identify / address high-risk regions. Following precautionary measures be considered to enhance preparedness and to mitigate impact of landslides / avalanches: -

(1) Review and update recorded history of landslides / avalanches in prone areas. In addition to conducting vulnerability risk assessments, gather information from local notables who have personal experience of such events for risk mitigation strategies.

(2) Raise awareness among local communities in vulnerable areas about the importance of paying special attention to weather forecasts and alerts. Heavy rainfall can trigger landslides and avalanches, while sudden temperature variations can increase the likelihood of avalanches in susceptible areas.

(3) Establish community-based early warning system as part of the response mechanism in landslide / avalanche-prone areas. Local notables be nominated to ensure timely dissemination of alerts; this may involve use of watchmen, loudspeakers, megaphones, whistles, SMS alerts, telephonic communications or any other suitable means to alert the community.

(4) Based on landslide / avalanche alerts issued by PMD, local administration to consider precautionary measures such as closing roads and tracks leading to avalanche / landslide-prone areas. Contingency plans should include organized evacuation of people to safer locations.

(5) Conduct detailed geological and geotechnical surveys in high-risk areas to assess slope stability and identify potential landslide and avalanche zones.

(6) Implement slope stabilization techniques such as slope reinforcement, retaining walls and erosion control measures in vulnerable areas to minimize the risk of landslides / avalanches.

(7) Promote afforestation and sustainable land use practices to enhance slope stability and reduce susceptibility of slopes to erosion and failure.

(8) Develop and implement building codes / structural resilience strategies that consider the risk of landslides / avalanches, particularly in mountainous regions.

e. **Cyclones**. While Cyclone Season has y passed, owing to changes in temperature, the possibility of such events cannot be completely ruled out at the start or end of Monsoon Season. Therefore, following guidelines can protect people / property in vulnerable areas: -

(1) Enhance meteorological infrastructure to improve cyclone monitoring and prediction accuracy, utilizing advanced technologies such as Doppler radar and satellite imagery.

(2) Strengthen collaboration and information sharing among meteorological departments (PMD / SUPARCO), DM agencies and stakeholders for timely dissemination of cyclone warnings.

(3) Develop clear protocols and SOPs for issuing cyclone warnings, ensuring consistent and comprehensible communication.

(4) Conduct public awareness campaigns utilizing diverse media channels, educational materials and community engagement initiatives to increase public understanding of cyclones, their associated hazards and the necessary actions individuals should take before, during and after a cyclone event.

(5) Establish community-based early warning systems in cyclone-prone areas leveraging technology and local networks to disseminate timely and location-specific alerts through various channels, such as loudspeakers, sirens, SMS alerts, community radio and social media platforms, ensuring that communities receive warnings and can take appropriate actions to safeguard their lives and property.

(6) Develop evacuation plans for high-risk coastal areas, identifying safe shelters, evacuation routes, transportation arrangements and the mobilization of resources necessary for orderly and efficient evacuation of residents to designated safe areas.

(7) Conduct drills to test the effectiveness of evacuation plans and response mechanisms.

(8) Strengthen critical infrastructure in coastal areas to withstand cyclonic winds and storm surges by implementing cyclone-resistant designs, construction standards and retrofitting measures.

(9) Promote individual preparedness through family emergency plans and supply kits.

(10) Provide training and capacity building for first responders and emergency management personnel.

(11) Foster collaboration with national and international partners for assistance and technical support.

(12) Conduct post-cyclone assessments to identify lessons learned and improve future responses.

22. **Early Warning System**

a. **Early Warning by Government Agencies**. PMD will be the focal organization supported by NDMA Tech Team in providing flood early warnings and it is the only authorized agency to issue weather / flood forecasts. PDMAs / GDMA / SDMA must strictly guard against issuance of climate-based warnings based on open-source applications. Following measures should be undertaken by PMD and other stakeholders for effective dissemination of alerts: -

(1) FFD, subordinate department of PMD, will disseminate daily flood forecasts during the Monsoon season.

(2) Weather and flood forecasts / advisories will be issued based on a predefined schedule, detailed as follows: -

(a) **Normal Conditions**

Monthly	First week of the month
Weekly	Every Monday

(b) **Onset of Floods**

Normal	Every 24 hours
High / Very High	6 hours
Significant Event	Every hour
Extreme Event	Minimum permissible time before occurrence

(3) Respective PDMAs will issue specific weather advisories / warnings / flood alerts to district authorities and relevant stakeholders via fax, email, telephone, SMS, WhatsApp messages and instant website uploads.

(4) NDMA / PDMAs / GBDMA / SDMA and PMD will release breaking news or tickers to TV, including the national TV. Additionally, PMD has a broadcasting studio within its premises that will be utilized for video updates. Radio broadcasts will be utilized through national and FM radio stations to keep public informed about impending disasters and related advisories.

(5) Important advisories and alerts will be shared on social media platforms (Twitter, Facebook) through official government agency accounts only.

(6) PMD will designate a focal person authorized to deal with weather and flood forecasts, whose contact information will be made available to all stakeholders for timely communication. In this regard, a WhatsApp group by NDMA, named "DM Responders" will also be utilized for information dissemination and issuance of guidance / instructions.

b. **Community Early Warning through Advisories**

(1) Public Service Messages (PSMs) must be generated forthwith by PDMAs / GBDMA / SDMA and DDMAs through print and electronic media.

(2) Disseminate crucial information to the public through billboards, posters, banners, brochures, warning signs and floodwater level indicators. These communication channels serve to educate and alert individuals living in at-risk areas.

(3) All concerned departments and local communities must be apprised about the forecast and its likely unfolding at the onset of Monsoon.

(4) Communities are provided information about safer places, relief camps and evacuation plans by concerned departments.

(5) To avoid false alarms, all Disaster Management Authorities ensure implementation of Clause 35 of National Disaster Management Act 2010.

(6) Community-based indigenous early warning systems are established in areas vulnerable to flash floods, landslides, GLOFs and avalanches through the following means: -

(a) Placement of round-the-clock lookouts, especially during periods of intense rain or at night.

(b) Use of sirens or announcements on loudspeakers, including those in mosques.

(c) Traditional methods such as lighting fires and drum beating by people residing in higher areas of such regions.

(d) Conducting evacuation drills to familiarize the community with the evacuation process.

Response Phase Anticipatory Actions (Rescue and Relief)

23. During the initial stages of disaster response, rescue operations play a vital role in saving precious lives and ensuring safety of affected individuals. Following must be done by all concerned: -

a. **General Response Guidelines**

(1) Plan forced evacuation, if merited, in cases of limited warning time, utilizing all available provincial / district resources.

(2) DDMAs, as first responders, to mobilize communities for disaster response, promoting community involvement and addressing the issue of human resource scarcity.

(3) Prioritize rescue and evacuation of vulnerable groups, including the elderly, disabled, women and children.

(4) NHA and Pakistan Railways must restore communication infrastructure and establish alternate routes promptly.

(5) SUPARCO will provide NDMA with satellite imagery and assessments for projected flood developments in affected areas.

(6) Make traffic arrangements to regulate flow on national and provincial arteries in case of infrastructure damage caused by floods.

(7) Strictly curb disaster tourism to ensure public safety and prevent interference with rescue and relief operations.

(8) Coordinate and ensure the availability of flood rescue equipment (boats, OBMs) and trained responders (OBM operators) positioning them to respond effectively in various regions.

(9) Coordinate deployment of Urban Search and Rescue (USAR) teams through NDMA / PDMAs for operations in collapsed buildings and landslides within their respective provinces.

(10) PDMAs must ensure the provision of rationalized flood-fighting equipment as demanded by Pakistan Army before the onset of Monsoon 2023. PDMAs and Pakistan Army to establish a mutually devised mechanism for collection, utilization and maintenance of equipment as per requirements.

(11) Coordinate availability of staff from relevant departments, especially hospitals and emergency services, even on holidays during the Monsoon season.

(12) Incorporate Rescue 1122, emergency services, civil defence, volunteers and law enforcement agencies in rescue operations.

(13) Aviation efforts be requisitioned through NDMA by respective Provincial / State Governments with expenditures to be borne by the respective Govts.

b. **Rescue Measures for Riverine Floods**

(1) Activate the established coordination mechanism led by DM agencies for a swift and well-coordinated response.

(2) Mobilize SAR teams equipped with flood rescue equipment, strategically placed in flood-prone areas along riverine regions.

(3) Prioritize the rescue and evacuation of individuals stranded or isolated by rising water levels in riverine flood situations.

(4) Establish temporary shelters and safe evacuation routes for affected communities in riverine flood zones.

(5) Conduct aerial surveys and utilize drones to identify submerged or stranded individuals for targeted rescue operations.

(6) Coordinate with SUPARCO to obtain real-time satellite imagery and flood assessments for effective rescue operations.

(7) Deploy specialized watercraft and trained personnel for swift water rescue and evacuation in riverine flood scenarios.

(8) Implement a robust communication system to ensure coordination between search and rescue teams and local authorities.

c. **Rescue Measures for Flash Floods**

(1) Collaborate with local authorities, relevant departments and emergency services to develop specific search and rescue strategies for flash flood scenarios.

(2) Activate the established coordination mechanism for a swift and well-coordinated response.

(3) Mobilize search and rescue teams with flood rescue equipment and specialized swift water rescue gear for rapid response in flash flood-prone areas.

(4) Prioritize evacuation and rescue of individuals trapped in rapidly rising floodwaters or isolated by flash floods.

(5) Utilize early warning systems and community alerts, to warn vulnerable communities in flash flood-prone areas.

(6) Conduct rapid assessments of affected areas to identify high-risk locations and deploy search and rescue teams accordingly.

(7) Coordinate with NDMA to requisition USAR Team support, if required for specialized rescue operations.

(8) Establish temporary shelters and medical assistance centers in safe locations for evacuated individuals.

d. **Rescue Measures for Landslides / Avalanches / GLOFs**

(1) Develop protocols for the rapid deployment of search and rescue teams and specialized equipment in landslide, avalanche and GLOF-prone areas.

(2) Mobilize search and rescue teams equipped with necessary equipment for debris clearance, excavation and retrieval operations in landslide and avalanche scenarios.

(3) Utilize early warning systems and communication networks to alert vulnerable communities in high-risk areas prone to landslides, avalanches and GLOFs.

(4) Coordinate with NDMA to requisition Pakistan Army USAR team support, if required for specialized search and rescue operations in landslide, avalanche and GLOF situations.

(5) Establish mechanisms for coordination between different agencies involved in search and rescue operations in landslide and avalanche scenarios.

e. **Rescue Measures for Urban Floods**

(1) Activate the established coordination mechanism for a swift and well-coordinated response to urban flooding situations.

(2) Mobilize search and rescue teams equipped with flood rescue equipment and necessary urban search and rescue (USAR) tools for operations in urban flood scenarios.

(3) Prioritize the rescue and evacuation of individuals trapped in flooded buildings, vehicles, or other dangerous situations.

(4) Conduct search and rescue operations in coordination with local authorities, emergency services, civil defence and specialized USAR teams.

(5) Requisition aviation support through NDMA, if needed for aerial search and rescue operations in urban flood-affected areas.

(6) Establish communication systems to provide real-time updates and instructions to affected communities.

(7) Conduct post-disaster assessments to identify areas of improvement in search and rescue strategies for urban flooding incidents.

f. **Parameters for Flood Rescue Equipment**. Need based rationalization of the quantity of rescue boats and type of OBMs is to be done based on factors mentioned below to configure optimal response against envisaged flood threat with availability of sufficient reserves at required tiers of response: -

(1) Respective provinces are responsible for establishing the requirement of boats vis-à-vis threat of flood / vulnerability / exposure / risk assessment.

(2) Districts must be prioritized as High Threat (Priority-I), Medium Threat (Priority-II) and Low Threat (Priority-III) based on following aspects: -

(a) Historical flood data record.

(b) Population density.

(c) Urban / rural divide.

(d) Type of flood threat i.e. riverine, flash, urban etc.

(e) Degree of vulnerability and exposure e.g. population centres in water ways / proximity to rivers.

(f) Reaction time.

(3) Maximum number of passengers carried by a fibre glass rescue boat be determined as per boat size / capacity.

(4) Response action will have following sequence: -

(a) **1st Tier - Immediate Response**. DDMA/ District Administration will be responsible to generate 1st Tier response through collaboration with line departments, Rescue 1122, Civil Def organization and trained volunteers (if held). Local communities will be incorporated into response mechanism only if situation permits and the people involved are not exposed to any further risk.

(b) **2nd Tier - Build Up Response**. Respective PDMAs/ GBDMA/ SDMA and ICT Administration will be responsible to collaborate and build-up 2nd Tier response through augmentation of resources from adjacent / neighbouring districts and mobilising provincial resources including NGOs / INGOs in the area. LEAs, CAF and Armed Forces can be requested to assist if situation warrants such employment. Regional USAR teams will also be mobilised if specialised tasks / requirements arise.

(5) **Positioning of Rescue Boats**. The location of rescue boats will be decided based on the following aspects: -

(a) Availability of reaction time vis-à-vis flood warning, transportation time to water line and mobilization time of crew.

(b) Road communication infrastructure vis-à-vis threat of isolation in case some roads are cut-off or traffic jams deny transportation in time.

(c) Time required for build-up in shifting of resources.

(6) **Priority of Districts**. The priority will be established by respective provinces after due deliberation / consultation and shared with all stakeholders for standardized planning: -

(a) **Priority - I Districts (High Threat)**. These districts should be historically affected by floods (riverine / flash) and situated alongside rivers, Nullahs and hill torrents with relatively higher number of population.

(b) **Priority - II Districts (Medium Threat)**. These are medium priority districts, historically less affected by any type of floods with relatively low number of population.

(c) **Priority - III Districts (Low Threat)**. These are low priority districts, historically least affected by any type of flood and with relatively lesser number of population.

24. **Relief Phase**. After the search and rescue phase, focus shifts to relief operations, which are crucial for providing immediate assistance and support to affected communities. Following are the key recommendations and guidelines for an effective relief phase: -

a. **General Relief Guidelines**

(1) Incorporate NDMA's Guidelines on Multi-Sector Initial Rapid Assessment (MIRA) and Minimum Standards of Relief in Camp and Ex-gratia Assistance into all plans and stages.

(2) Design standardized food packs based on local requirements, including essential items like rice, wheat bags, ghee and milk for babies.

(3) Distribute water purification tablets and filtration to provide clean drinking water to affected people.

(4) Ensure a fair and organized distribution method for relief goods, consulting with local communities.

(5) Consider cultural context and specific food requirements for different groups, such as lactating mothers, pregnant women, infants, children and the elderly. Needs of the entire family unit must be catered to.

(6) Engage trained community teams to assist in emergency shelter planning, relief distribution, identification of missing individuals and addressing education / healthcare / water supply / sanitation / food needs.

(7) Implement the Minimum Initial Service Package (MISP) to reduce mortality, morbidity and disability, especially among women and girls, by strengthening provincial and district capacities and coordinating with stakeholders.

(8) Implement emergency preparedness plans for the education sector to ensure continuity of structured learning during disasters.

(9) Ensure that dignity of all affected persons is protected during the relief phase. Planned and need based without any segregation and avoid unnecessary gatherings for media coverage and pictures of all affected.

(10) In collaboration with provincial health departments, conduct anti-dengue / malaria / COVID-19 prevention campaigns such as spraying and removing stagnant water and implement safety precautions for COVID-19 including social distancing and disinfection.

(11) Maintain and follow supply chain of relief goods in true letter and spirit. DDMAs are the 1st Tier, supported by PDMAs to provide immediate relief. Similarly, 2nd Tier PDMAs, should be ready to render assistance once the stocks of DDMAs are exhausted. 3rd Tier of NDMA supported by national resources to extend relief support required by the provinces / regions: -

(a) NDMA maintains its stocks at strategic locations. PDMAs are responsible to collect the stocks once released by NDMA from a particular location.

(b) NDMA stocks will be requisitioned only in case of extreme emergency and with sufficient reaction time.

(c) Distribution of tents at site must be avoided. People must be motivated to come to relief camps.

(12) Establish an effective supply chain management mechanism with prequalified suppliers and transport contractors for emergency transportation of relief items.

b. **Relief Measures for Riverine Floods**

(1) Establish temporary relief camps equipped with essential facilities such as shelter, clean water, sanitation and healthcare services in safe locations away from flood-prone areas.

(2) Provide immediate medical assistance by setting up medical camps staffed with trained healthcare professionals.

(3) Ensure the availability of clean drinking water through the distribution of water purification tablets, water tankers, or installation of water treatment units.

(4) Distribute food rations and essential items to affected communities, prioritizing vulnerable groups such as children, women and the elderly.

(5) Conduct rapid assessments to identify and prioritize the restoration of critical infrastructure, including roads, bridges and communication networks.

(6) Implement early recovery measures, including debris clearance, rehabilitation of damaged structures and livelihood support to affected communities.

(7) Coordinate with relevant departments and organizations to provide psychosocial support / counselling services to affected individuals and communities.

(8) Conduct comprehensive damage assessments to facilitate the estimation of losses and inform future mitigation and preparedness measures.

c. **Relief Measures for Flash Floods**

(1) Establish temporary shelters and evacuation centres equipped with essential facilities for displaced individuals.

(2) Ensure immediate medical support by deploying mobile medical teams to provide emergency healthcare services.

(3) Coordinate with relevant departments and organizations to provide emergency relief supplies, including food, water and essential items, to affected communities.

(4) Implement early warning systems and public awareness campaigns to educate communities on flash flood risks and evacuation procedures.

(5) Conduct rapid damage assessments to identify critical infrastructure and prioritize restoration efforts.

(6) Provide support for the repair and reconstruction of damaged houses, public buildings and infrastructure.

(7) Develop and implement community-based disaster risk reduction programs, focusing on flash flood preparedness, early warning systems and evacuation plans.

(8) Facilitate the rehabilitation of livelihoods through vocational training, income-generating activities and small-scale business support.

d. **Relief Measures for Landslides / Avalanches / GLOFs**

(1) Mobilize emergency response teams specialized in landslide, avalanche and GLOF rescue and relief operations.

(2) Conduct immediate search and rescue operations using specialized equipment and techniques for locating and extricating trapped individuals.

(3) Provide medical support and establish medical camps near landslide / avalanche-prone areas to ensure prompt medical assistance.

(4) Deploy teams for debris clearance and restoration of critical infrastructure, including roads, bridges and utilities.

(5) Conduct comprehensive damage assessments to estimate losses and facilitate recovery planning.

(6) Implement measures to prevent secondary hazards such as damming of rivers or lakes due to landslides or avalanches.

(7) Promote long-term measures for landslide and avalanche mitigation, including slope stabilization, afforestation and land use planning.

e. **Relief Measures for Urban Flooding**

(1) Establish temporary shelters and evacuation centres equipped with essential facilities for displaced individuals in urban areas.

(2) Ensure immediate medical support by establishing medical response teams and deploying mobile medical units to affected areas.

(3) Provide emergency relief supplies, including food, clean water and essential items, to affected communities in coordination with relevant departments and organizations.

(4) Conduct rapid damage assessments to identify critical infrastructure and prioritize restoration efforts.

(5) Implement measures for drainage system cleaning, unclogging and repair to alleviate urban flooding.

(6) Coordinate with relevant departments to ensure restoration of essential services such as electricity, water supply and communication networks.

(7) Conduct awareness campaigns to educate communities on urban flood risks, safe hygiene practices and disease prevention.

(8) Provide support for the rehabilitation and reconstruction of damaged houses, public buildings and infrastructure in urban areas.

Early Recovery Phase Anticipatory Actions

25. Early recovery phase is a critical period that follows the initial response to a disaster. During this phase, the focus shifts towards restoring essential services, rebuilding livelihoods and promoting the overall recovery of affected communities. The following recommendations and guidelines are crucial for effective early recovery efforts: -

a. **General Early Recovery Guidelines**

(1) **Early Recovery Planning**

(a) Develop and implement an Early Recovery Plan based on the findings of the rapid assessments and in coordination with relevant stakeholders.

(b) Ensure the plan includes specific objectives, activities, timelines and responsibilities for the early recovery phase.

(c) Prioritize activities that focus on restoring basic services, infrastructure, livelihoods and community resilience.

(2) **Disaster Assessment & Monitoring**

(a) Implement the Multi-Sector Initial Rapid Assessment (MIRA) framework developed by NDMA and UNOCHA to identify strategic humanitarian priorities, assess the scale of the disaster and determine priority areas of assistance.

(b) Deploy trained human resources from PDMAs / DDMAs to conduct rapid assessments using the MIRA module.

(c) Collaborate with NDMA, PDMA, UN agencies, INGOs and NGOs to carry out rapid assessments and gather data on the needs and priorities of affected and vulnerable communities.

(d) Share initial assessment report with Disaster Management Authorities within one week and the final report within two weeks to facilitate timely decision-making and planning.

(3) **Infrastructure Rehabilitation**

(a) Assess and prioritize damaged infrastructure, such as roads, bridges, schools, health facilities and water and sanitation systems for timely rehabilitation.

(b) Engage qualified engineers and construction experts to oversee the repair and reconstruction process.

(c) Ensure that infrastructure rehabilitation projects adhere to safety standards and incorporate disaster risk reduction measures.

(4) **Livelihoods and Economic Recovery**

(a) Conduct assessments to identify the impact of the disaster on livelihoods and economic activities in the affected areas.

(b) Develop and implement livelihood support programs, including cash-for-work initiatives, vocational training and access to microfinance, to help communities recover and rebuild their economic capacities.

(c) Promote the revival of local markets and businesses through targeted support and incentives.

(5) **Social and Community Support**

(a) Strengthen community-based organizations and promote community participation in decision-making processes related to early recovery efforts.

(b) Foster social cohesion and inclusivity by addressing the needs of vulnerable groups, including women, children, elderly individuals and persons with disabilities.

(6) **Coordination and Partnerships**

(a) Establish effective coordination mechanisms among government agencies, humanitarian organizations, civil society and other relevant stakeholders involved in early recovery efforts.

(b) Foster partnerships with national / international actors to leverage resources, technical expertise and knowledge sharing for efficient and effective early recovery interventions.

(c) Maintain regular communication and information sharing platforms to ensure coordinated and harmonized efforts.

b. **Hazard-Specific Early Recovery Guidelines**

(1) **Riverine Floods**

(a) Conduct rapid damage assessments to identify priority areas for early recovery interventions, focusing on critical infrastructure and community needs.

(b) Provide immediate support for the restoration of water supply, sanitation and hygiene facilities to prevent waterborne diseases.

(c) Support the rehabilitation of damaged houses and community infrastructure, prioritizing the most vulnerable households.

(d) Assist in the recovery of agriculture and livelihoods through the provision of seeds, tools and technical support for quick replanting.

(e) Facilitate the reestablishment of local markets and income-generating activities to restore economic stability.

(f) Collaborate with local communities to develop and implement community-based early warning systems for future flood events.

(g) Ensure the active participation of affected communities in decision-making processes and the planning of early recovery interventions.

(2) **Flash Floods**

(a) Conduct rapid assessments to identify immediate early recovery needs, focusing on emergency shelter, clean water and food assistance.

(b) Provide temporary shelter solutions for displaced individuals and families, ensuring their safety and well-being.

(c) Support the rehabilitation of damaged infrastructure, such as roads and bridges, to restore access to affected areas.

(d) Facilitate the recovery of livelihoods through cash-for-work programs and the provision of livelihood inputs for short-term income generation.

(e) Promote community awareness and education on disaster risk reduction and preparedness to enhance resilience to future flash flood events.

(f) Incorporate environmental considerations in early recovery efforts to minimize further risks and promote sustainable recovery.

(3) **Landslides / Avalanches / GLOFs**

(a) Conduct rapid assessments to identify priority areas for early recovery interventions, focusing on emergency shelter, medical support and search & rescue operations.

(b) Provide immediate support for the rehabilitation and reconstruction of damaged infrastructure.

(c) Support the recovery of livelihoods through the provision of alternative income-generation opportunities and vocational training.

(d) Promote community engagement and participation in early recovery efforts, ensuring the inclusion of marginalized groups.

(e) Facilitate the restoration of social services, including education and healthcare facilities, to support community recovery.

(f) Strengthen local capacities and institutional frameworks for disaster risk reduction and early recovery planning.

(4) **Urban Flooding**

(a) Conduct rapid assessments to identify immediate early recovery needs in urban areas, focusing on emergency evacuation, temporary shelter and basic necessities.

(b) Support the restoration of critical services, such as water supply, sanitation and electricity, to ensure the well-being of affected urban populations.

(c) Assist in the rehabilitation of damaged housing and infrastructure, prioritizing the most vulnerable communities.

(d) Promote community-led initiatives for urban drainage clearance and debris management to mitigate future flooding risks.

(e) Support local businesses and economic recovery through financial assistance and revitalization programs.

(f) Strengthen coordination and collaboration among relevant stakeholders, including government agencies, NGOs and community-based organizations for an effective early recovery response.

c. **Needs & Concerns of Vulnerable Groups**. Following aspects must be kept in focus during all stages of flood management: -

(1) Promote fair and equitable access to basic services, particularly in health and hygiene for vulnerable groups.

(2) Ensure relief sites and camps have separate washrooms with locks, adequate lighting, water and sanitation facilities to address women's security needs.

(3) Make female doctors and psychosocial support personnel available to cater to the specific needs of women and children.

(4) Establish mobile medical units equipped with safe delivery, post-natal facilities and referral services to provide essential healthcare to vulnerable groups.

(5) Establish separate sleeping areas for women and children to ensure their safety and privacy.

(6) Facilitate access nutritious food and clean drinking water for vulnerable groups, including children, elderly individuals, pregnant women and feeding mothers.

(7) Prioritize the needs of children and persons with disabilities, including child-safe spaces, ramps and accessible toilets.

(8) Implement measures to prevent and address gender-based violence, such as establishing safe reporting mechanisms and providing counselling services.

Coordination Aspects

26. **Inter Provincial / Regional Coordination**. During management of disasters, inter provincial / regional coordination mechanism can require assistance especially in far flung areas in shortest possible time thus reducing sufferings of distressed population. Information about resources of neighbouring provincial / regional government resources can be more conveniently incorporated in response phase.

27. **Coordination Spectrum**

a. All stakeholders will monitor flood situation by activation of Emergency Operation Centres (EOCs). EOCs will be activated by provincial DMAs, ICT administration / CDA, Pakistan Armed Forces and all relevant stakeholders as per respective SOPs from 15 June to 15 September, unless Monsoon is prolonged.

b. All stakeholders including Pakistan Armed Forces, FFC, FFD, PMD, NHA, NHEPRN & SUPARCO involved in flood management will nominate respective Liaison Officers (LOs) for National Emergency Operation Centre (NEOC) by 25 June.

c. If required, daily coordination conference will be organized by NDMA during a flood situation in NEOC at 1000 hours. All LOs will attend the conference.

d. All significant information will be immediately passed to NEOC by respective DM authorities.

e. **Coordination with UN Agencies and INGOs / NGOs**

(1) The support of UN Agencies and INGOs / NGOs will be utilised in a coordinated manner, mostly in preparedness, relief, post disaster assessments and rehabilitation phases.

(2) The capabilities of each organization must be ascertained to ensure its optimal utilisation.

(3) Need based employment of UN Agencies will be regulated by NDMA and PDMAs. Efforts will be made to avoid saturation of such agencies in a particular region.

(4) NGOs / INGOs duly cleared / approved by concerned ministries will be allowed to assist in relief operations.

28. **Reports and Returns**

a. Submission of Daily SITREP to NEOC by PDMAs / ICT Administration, PMD, FFC, FFD and NHA will be ensured as per already issued NDMA SITREP format with effect from 15 June onwards.

b. NDMA and PDMAs will update the situation on respective websites.

c. SUPARCO will provide the imageries of developing situations on daily basis. The imageries will be followed by detailed assessment of situation, damage assessment and projections.

d. To ensure a coordinated response, National Humanitarian Network (NHN) / Pakistan Humanitarian Forum (PHF) / UN Agencies and other agencies operating in Pakistan (Al-Khidmat, Edhi, Saylani etc) will share location of their stocks and human resource mapping with NDMA / PDMAs by no later than 15 May annually.

29. **Assistance / Coordination with Ministries / Departments**. Following ministries / departments are requested for assistance as mentioned against each: -

a. **Ministry of Defence**. Conduct of relief / rescue operations through Pakistan Armed Forces (helicopters, troops & rescue equipment) when required.

b. **Ministry of Interior**. Availability of aviation assets for emergency response, at a short notice. Provision of elaborate security to any foreign delegations and federal officials when visiting affected/ vulnerable areas.

c. **MoI&B, PID and PEMRA**. Airing of public service messages for community awareness on all media channels especially during prime hours.

d. **Pakistan Telecommunication Authority (PTA)**. To facilitate generation of SMS alerts for early warning, emergency relief and evacuation to required populace. Directions to all CMOs for extending APIs to NEOC for streamlining process of immediate alert/ advisory delivery.

e. **Pakistan Tourism Development Corporation (PTDC)**. Provision of timely weather / flood related information to tourists including protection from dangers of flash floods, landslides, GLOF etc and help evacuation of stranded tourists through local Government / Pakistan Armed Forces.

f. **Ministry of Communication**. To conduct assessment for early restoration of communication mechanism of all sub departments. In case of damage to infrastructure remain prepared to shift earth moving machinery to affected areas.

g. **Ministry of Railways**. To monitor railway tracks on regular basis and assist transportation of relief goods to affected areas.

30. **Requisitioning of Armed Forces**. Armed Forces will be requisitioned subject to provision of rules / regulations by PDMAs / DDMAs only in case of emergency through NDMA. Aviation support will be coordinated centrally by NDMA based on request of provinces and regions when called to assist in "Aid to Civil Power". Authorities utilizing services from Armed Forces will bear the cost of assets used which will be processed immediately after their employment. Armed Forces will be employed for following: -

a. Rescue and relief operations.
b. Aviation support.
c. Special search and rescue operations.
d. Medical support teams.
e. Search and rescue by USAR team and immediate support as per capabilities.

31. **Information Management**

a. NDMA / PDMA / GBDMA / SDMA / ICT Administration will update respective websites on 12 hourly basis during entire Monsoon season. In case of a significant activity / event / flood situation, it will be updated on 3 - 6 hours basis.
b. Print and electronic media / internet be utilized for dissemination of timely and accurate information.
c. Regular press releases, media tickers and press briefings will be ensured to present real time picture of ongoing activities, developing situations and losses / damages, if any.
d. To ensure post transmission record as well as redundancy, information will be disseminated through SMS, emails, fax and telephones.
e. SMS / WhatsApp Groups of relevant stakeholders will be made to ensure real time information sharing.

Logistical Considerations

32. NDMA has developed the **NDMA Stocking Policy 2023** for national, provincial and local level stocking of disaster relief items (available on NDMA website). The policy outlines the details for stocking and provision of relief items in Pakistan.

33. **Cardinals for Provision of Relief**. To ensure transparency, fairness and efficacy in provision of relief to disaster affectees, NDMA follows following cardinals for relief distribution: -

Based on damage and need (of an area / district).

a. Total and affected population.
b. Relief already provided / being provided (by various entities).
c. Need based equitable share.
d. Poverty profile and socio-economic conditions.
e. Logistical aspects.

34. **<u>Minimum Stocking Levels for Relief</u>.** All respective disaster management authorities at provincial and national levels and humanitarian stakeholders will maintain minimum required stocks of relief items which have been determined as per caseloads of targeted population. The same has been outlined in the **NDMA Stocking Policy 2023.** Brief details of stock levels are below: -

NDMA Minimum Stock Level													
Provinces / State	Locations	Status	Caseload	Household (HH) - 6 x Persons	Quantity								
					Family Tents (1 per HH)	Winterized Tents (1 per 4 HH)	Shelter Tents (1 per 83 HH)	Blankets (3 per HH)	Water Tanks (1 per 16 HH)	Water Filtration Plants (1 per 200 HH)	Life Jackets	Boats w/OBMs	De-Water Pumps
Islamabad	Islamabad	**Central**	110,000	18,333	18,333	6,499	223	45,000	938	105	1,500	33	150
Punjab	Lahore	Regional	30,000	5,000	5,000	500	60	15,000	313	25	300	8	20
	Muzaffargarh	Regional	40,000	6,667	6,667	1,667	80	20,000	417	30	200	9	20
KP	Jalozai	Regional	60,000	10,000	10,000	2,500	120	30,000	625	50	200	0	60
GB	Gilgit	Regional	20,000	3,333	3,333	2,000	40	30,000	417	0	100	0	0
AJ&K	Muzaffarabad	Regional	40,000	6,667	6,667	2,500	80	35,000	417	0	100	0	0
Sindh	Karachi	**Central**	90,000	15,000	15,000	0	181	10,000	938	75	1,500	36	100
	Hyderabad	Regional	20,000	3,333	3,333	0	40	5,000	208	40	500	10	50
	Sukkur	Regional	40,000	6,667	6,667	1,667	80	10,000	417	50	500	15	100
Balochistan	Quetta	Regional	50,000	8,333	8,333	3,500	100	50,000	521	42	100	0	0
Total			**500,000**	**83,333**	**83,333**	**20,833**	**1,004**	**250,000**	**5,208**	**417**	**5,000**	**111**	**500**

PDMAs / GBDMA / SDMA Minimum Stocking Levels									
Ser	Items	Scale /Persons	PDMA Pb Stock Lvl @1 Mn Pop	PDMA Bln Stock Lvl @ 0.15 Mn Pop	PDMA Sindh Stock Lvl @ 0.5 Mn Pop	PDMA KP Stock Lvl @ 0.35 Mn Pop	SDMA Stock Lvl @ 0.1 Mn Pop	GDBMA Stock Lvl @ 0.05 Mn Pop	Total
<u>RESCUE ITEMS</u>									
1	Life Jackets	100	10,000	1,500	5,000	3,500	100	50	**20,300**
2	Drilling Hammers	1800	556	83	278	194	56	28	**2,994**
<u>RELIEF ITEMS</u>									
3	Family Tents	6	166,667	25,000	83,333	58,333*	16,667*	8,333*	**358,339**
4	Blankets	2	500,000	75,000	250,000	175,000*	50,000*	25,000*	**1,075,002**
5	Mattresses	2	500,000	75,000	250,000	175,000	50,000	25,000	**1,075,002**
6	Quilts	2	500,000	75,000	250,000	175,000	50,000	25,000	**1,075,002**
7	Sleeping Bags	1	1,000,000	150,000	500,000	350,000	100,000	50,000	**2,150,001**
8	Tarpaulins	6	166,667	25,000	83,333	58,333	16,667	8,333	**358,339**
9	Mosquito Nets	2	500,000	75,000	250,000	175,000	0	0	**1,000,002**
10	Hygiene Kits	6	166,667	25,000	83,333	58,333	16,667	8,333	**358,339**
11	Kitchen Sets	6	166,667	25,000	83,333	58,333	16,667	8,333	**358,339**
12	Latrine Tents	24	41,667	6,250	20,833	14,583	4,167	2,083	**89,607**
13	Water Jerry Cans	12	83,333	12,500	41,667	29,167	8,333	4,167	**179,179**
14	Water Coolers	6	166,667	25,000	83,333	58,333	16,667	8,333	**358,339**
15	First Aid Kits	6	166,667	25,000	83,333	58,333	16,667	8,333	**358,339**
16	Kerosene Heaters w/ Jerry Cans	6	0	0	0	0	16,667	8,333	**25,000**
17	Warm Clothing	2	0	0	0	0	50,000	25,000	**75,000**
<u>SUPPORT ITEMS</u>									
18	Dewatering Pumps	100	10,000	1,500	5,000	3,500	0	0	**20,100**
19	Generators Smalls	100	10,000	1,500	5,000	3,500	1,000	500	**21,600**
20	Hand Pallet Trolleys	5,000	200	30	100	70	20	10	**5,430**

Conclusion

35. Pakistan's geographical location makes it susceptible to dynamic hazards throughout the year, especially during monsoons, and poses significant challenges and risks to our socio-economic and environmental fabric. With the growing influence of climate change, these challenges have become even more pronounced. The vulnerability underscores the importance of accurate weather forecasting, thorough impact assessments and a well-coordinated response. To address these issues, it is crucial to establish an efficient, proactive and synergetic system that involves all stakeholders in a coordinated response effort. Through the implementation of monsoon contingency plans of respective departments, we can enhance our resilience, effectively navigate the complexities of monsoon seasons and forge a path towards a more resilient and sustainable Pakistan.

Government of Pakistan
Prime Minister's Office
National Disaster Management Authority
Islamabad
Dated: **10 May 2024**

Brigadier
For Chairman NDMA
(**Muhammad Umar Chattha**)
Tel: 051-9030843

Annexes

A - NDM Act Clause - 9
B - Flood Hazard Map - Pakistan
C - GLOF Hazard Map - Pakistan
D - Landslide Hazard Map - Pakistan
E - Avalanche Hazard Map – Pakistan
F - Western Rivers Flood Inundation Map
G - Eastern Rivers Flood Inundation Map
H - River Indus Flood Projections
I - River Kabul Flood Projections
J - River Jhelum Flood Projections
K - River Chenab Flood Projections
L - River Ravi Flood Projections
M - Flood Routing Map
N - Flood Limits of Hydrological Structures
O - SITREP Format for Provinces/ Districts

Annex-A

NDM ACT CLAUSE - 9

8. **Establishment of the National Disaster Management Authority.**— (1) The Federal Government shall, immediately after issue of notification under sub-section (1) of section 3, establish an Authority to be known as National Disaster Management Authority.

(2) The National Authority shall consist of such number of members as may be prescribed and shall include [the Director General] as its Chairperson.

(3) There shall be a Director General of the National Authority, to be appointed by the Federal Government, on such terms and conditions, as may be prescribed.

9. **Powers and functions of the National Disaster Management Authority.**— The National Authority shall—

(a) act as the implementing, co-ordinating and monitoring body for disaster management;

(b) prepare the National Plan to be approved by the National Commission;

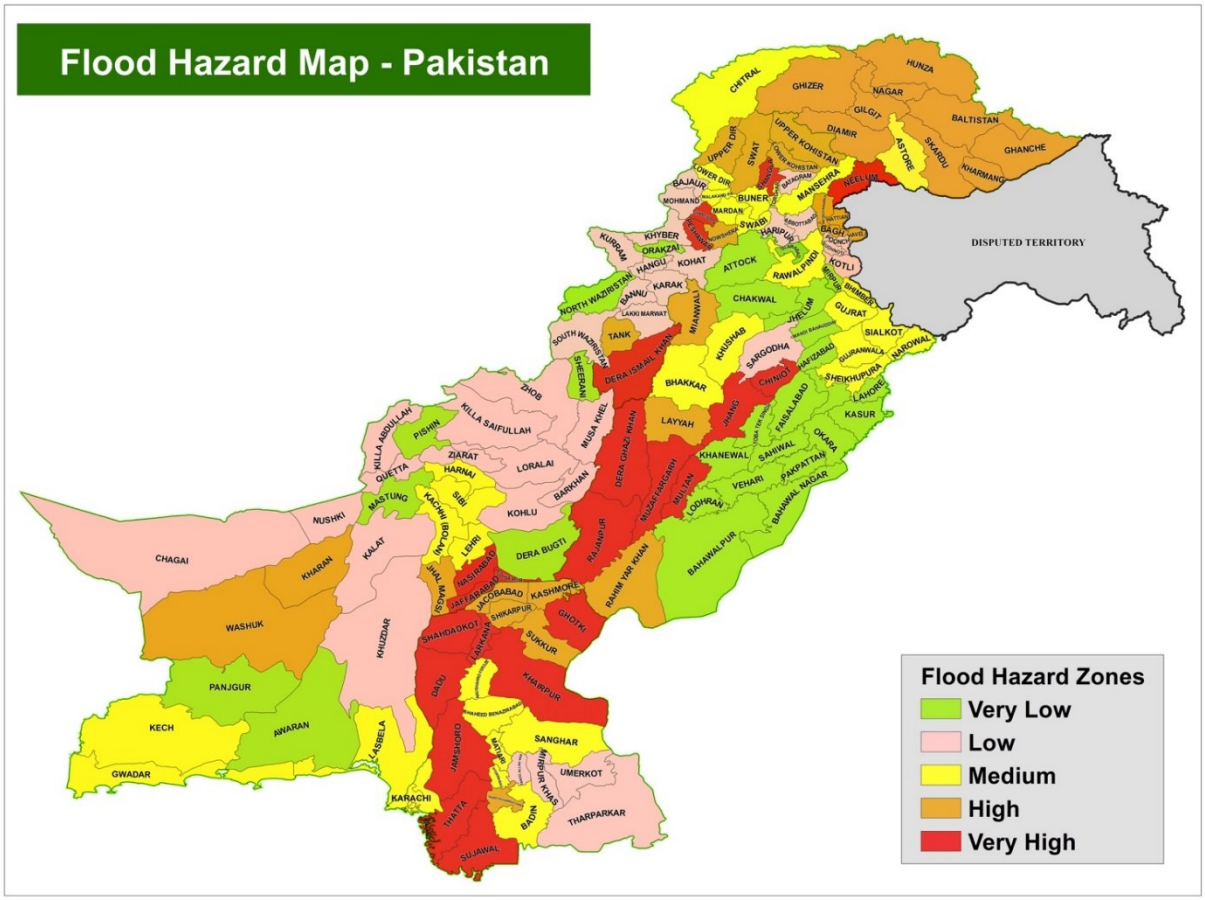
(c) implement, co-ordinate and monitor the implementation of the national policy;

(d) lay down guidelines for preparing disaster management plans by different Ministries or departments and the Provincial Authorities;

(e) provide necessary technical assistance to the Provincial Governments and the Provincial Authorities for preparing their disaster management

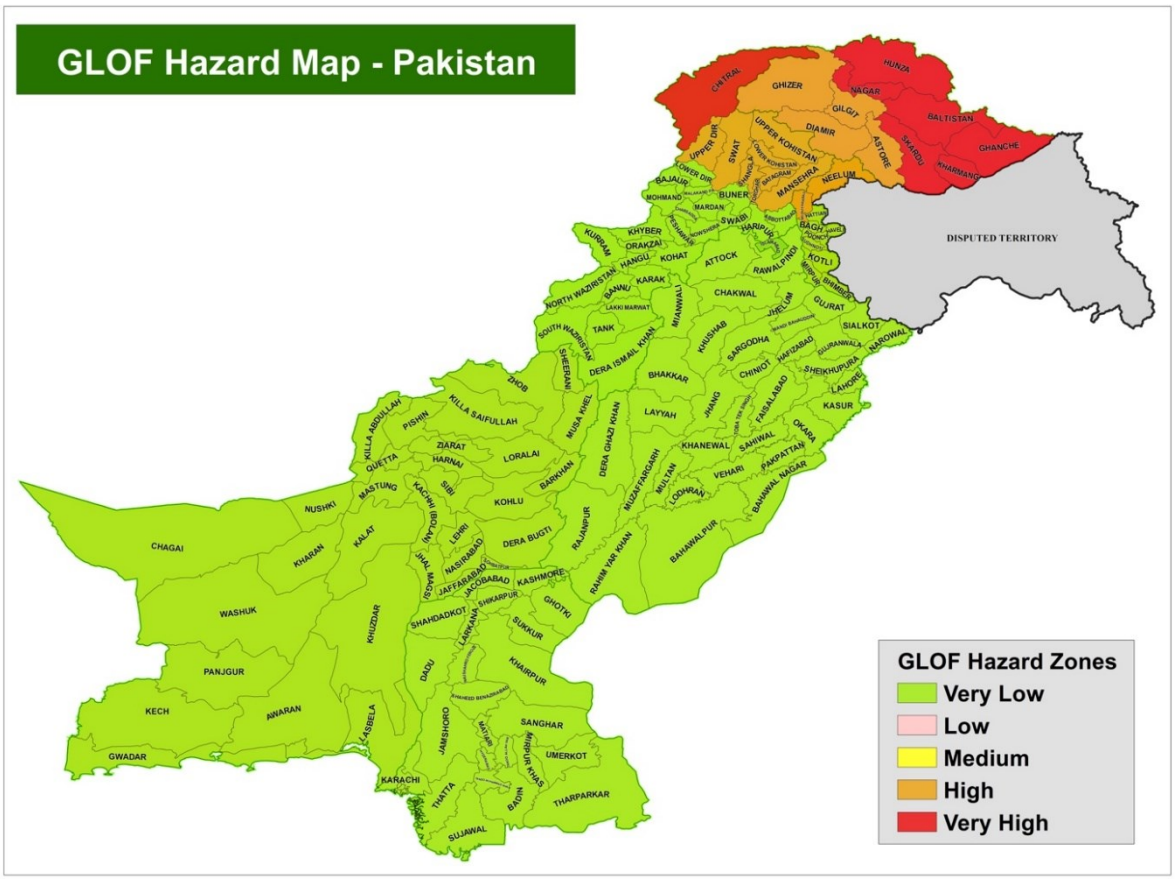
Annex-B

FLOOD HAZARD MAP



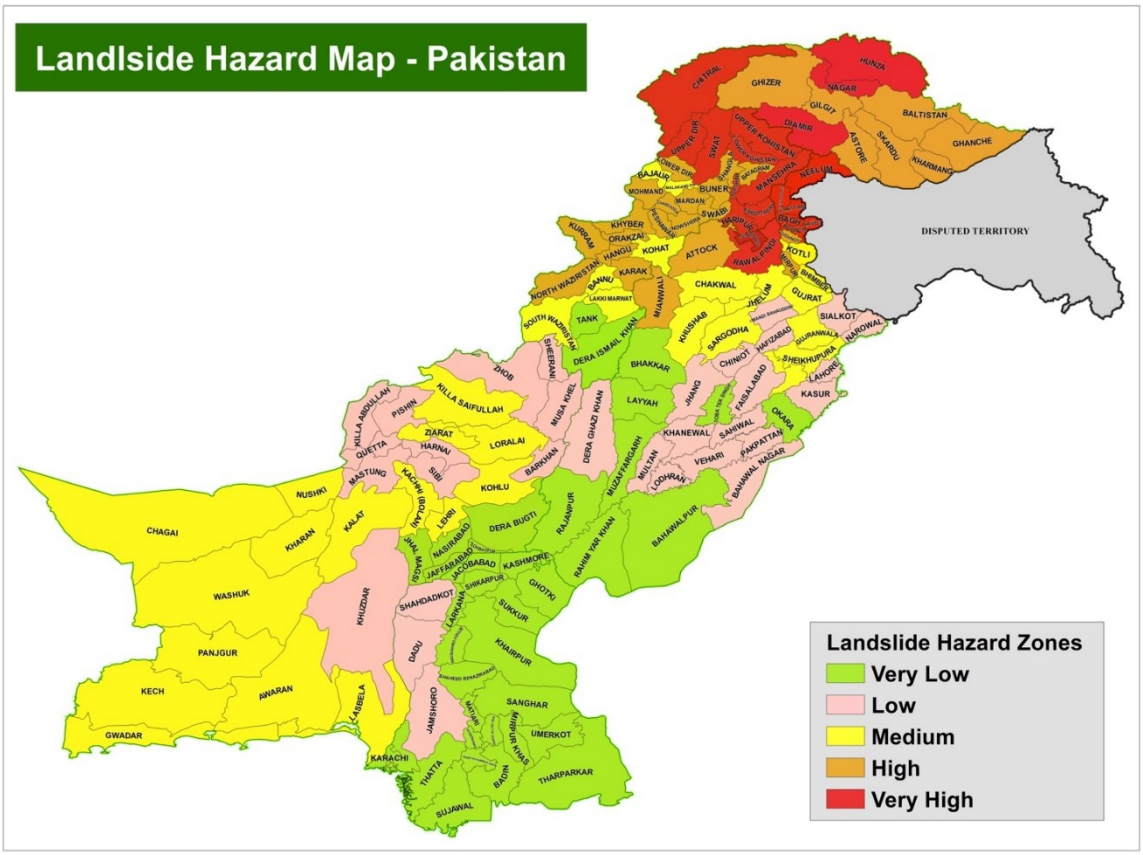
Annex-C

GLOF HAZARD MAP



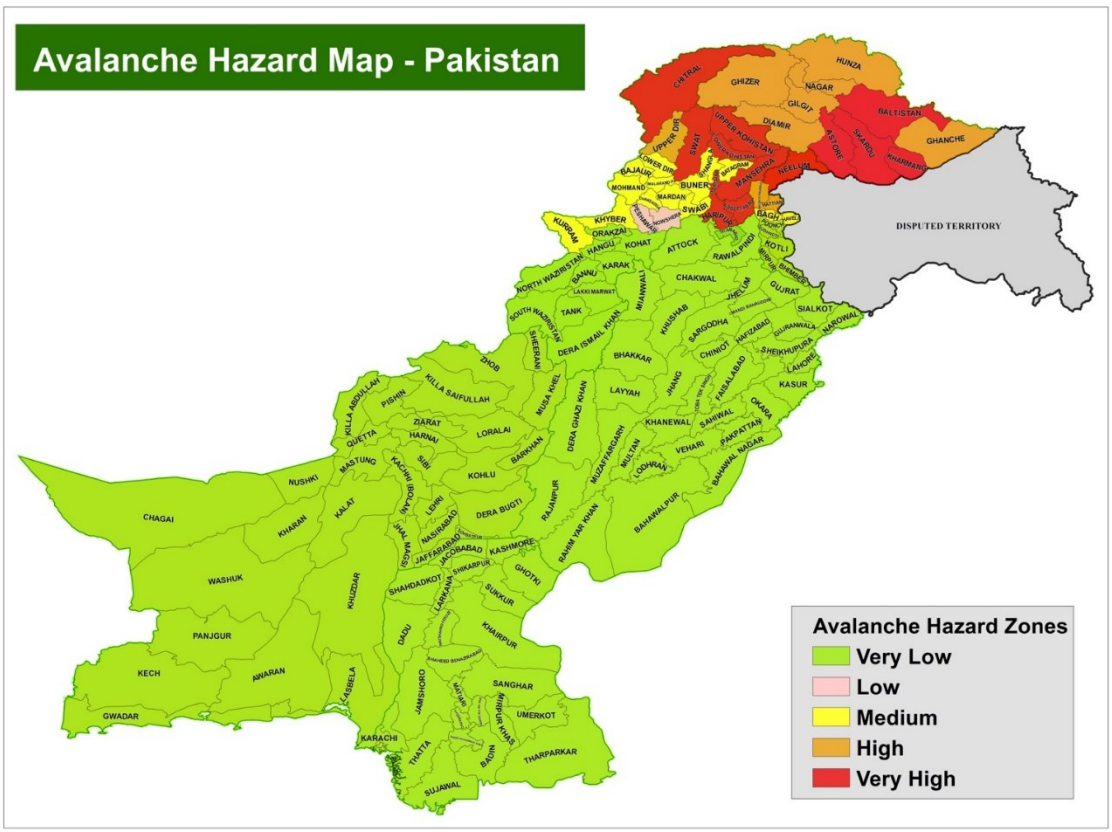
Annex-D

LANDSLIDE HAZARD MAP

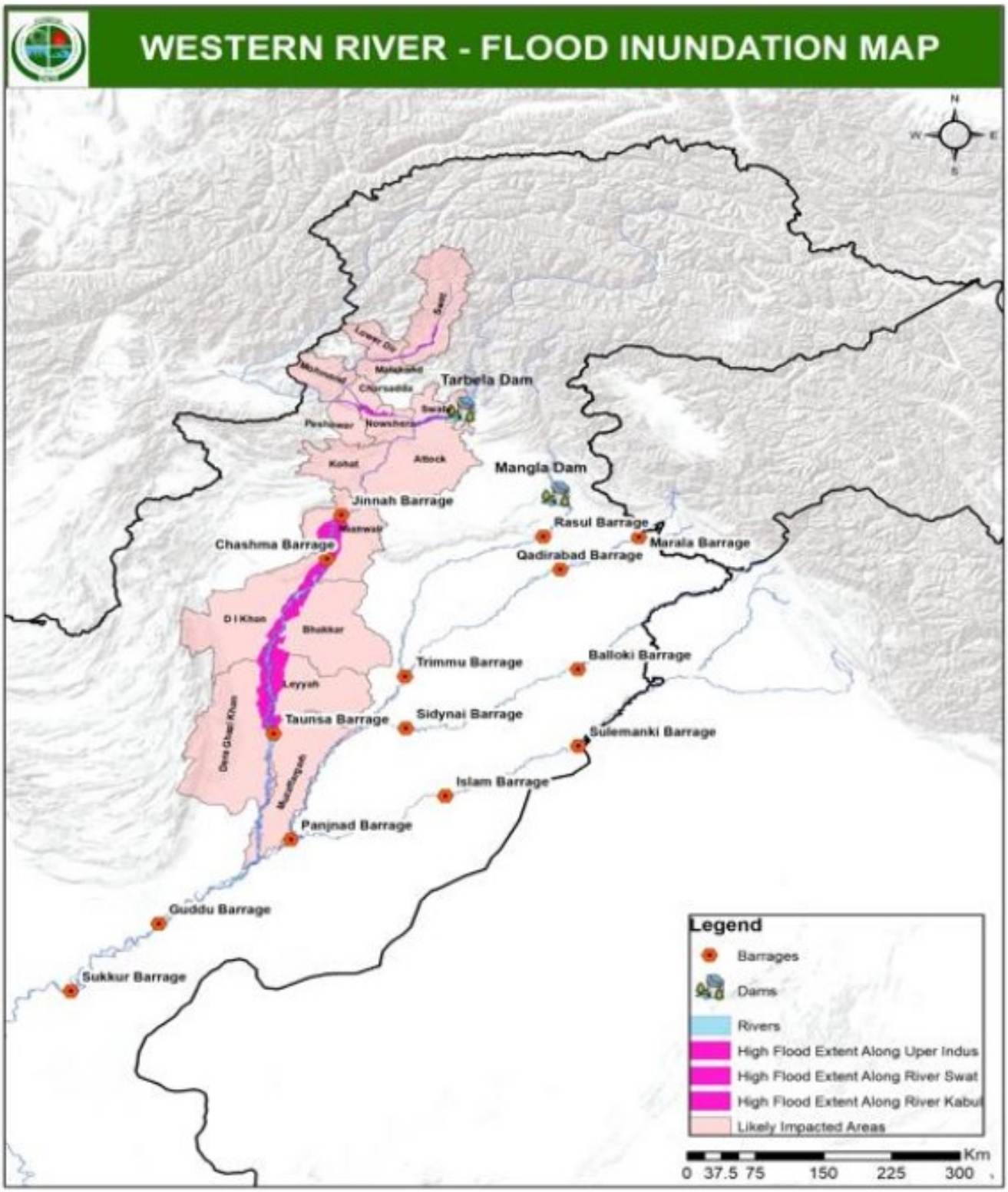


Annex-E

AVALANCHE HAZARD MAP

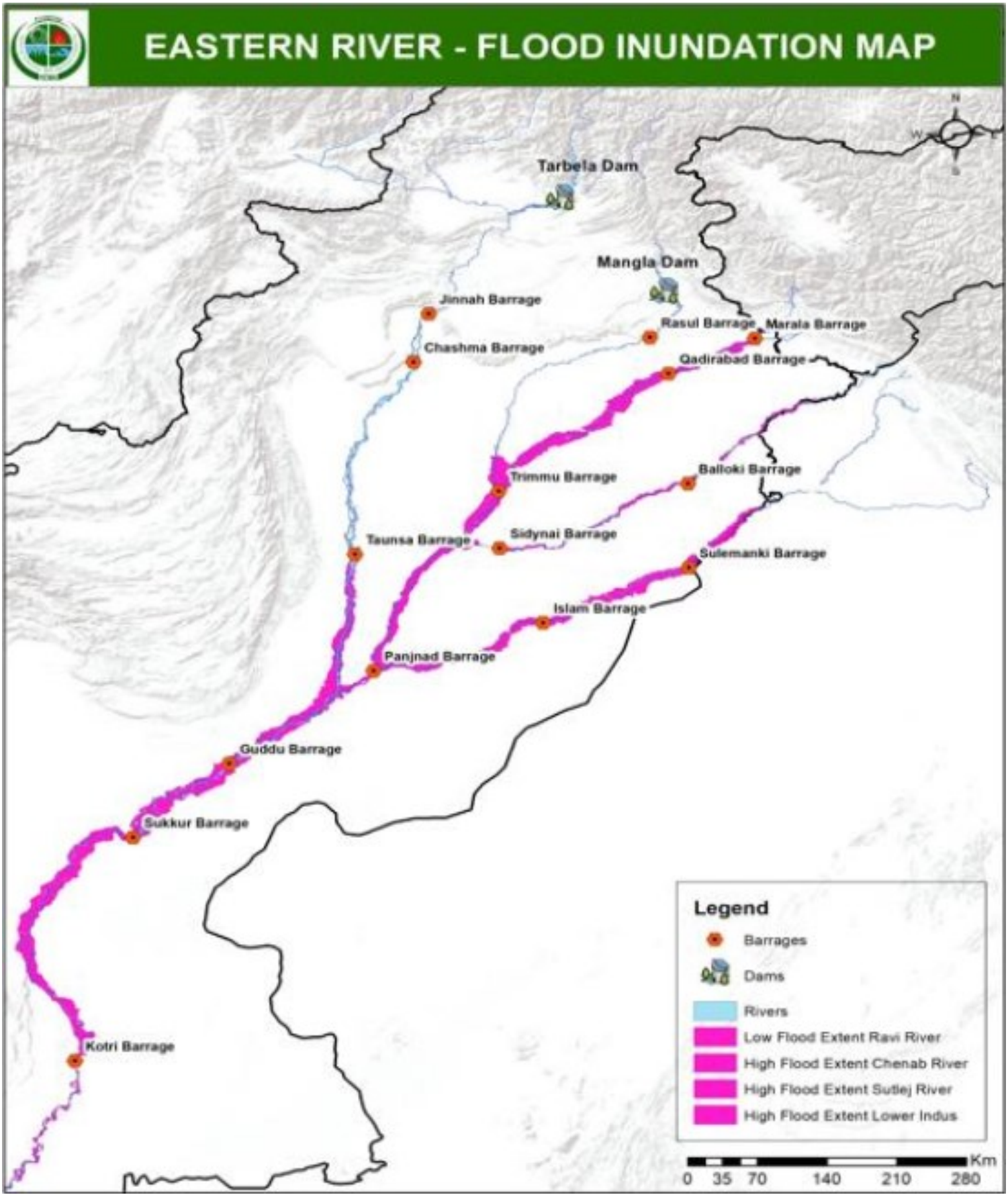


WESTERN RIVERS FLOOD INUNDATION MAP – MAJOR RIVERS



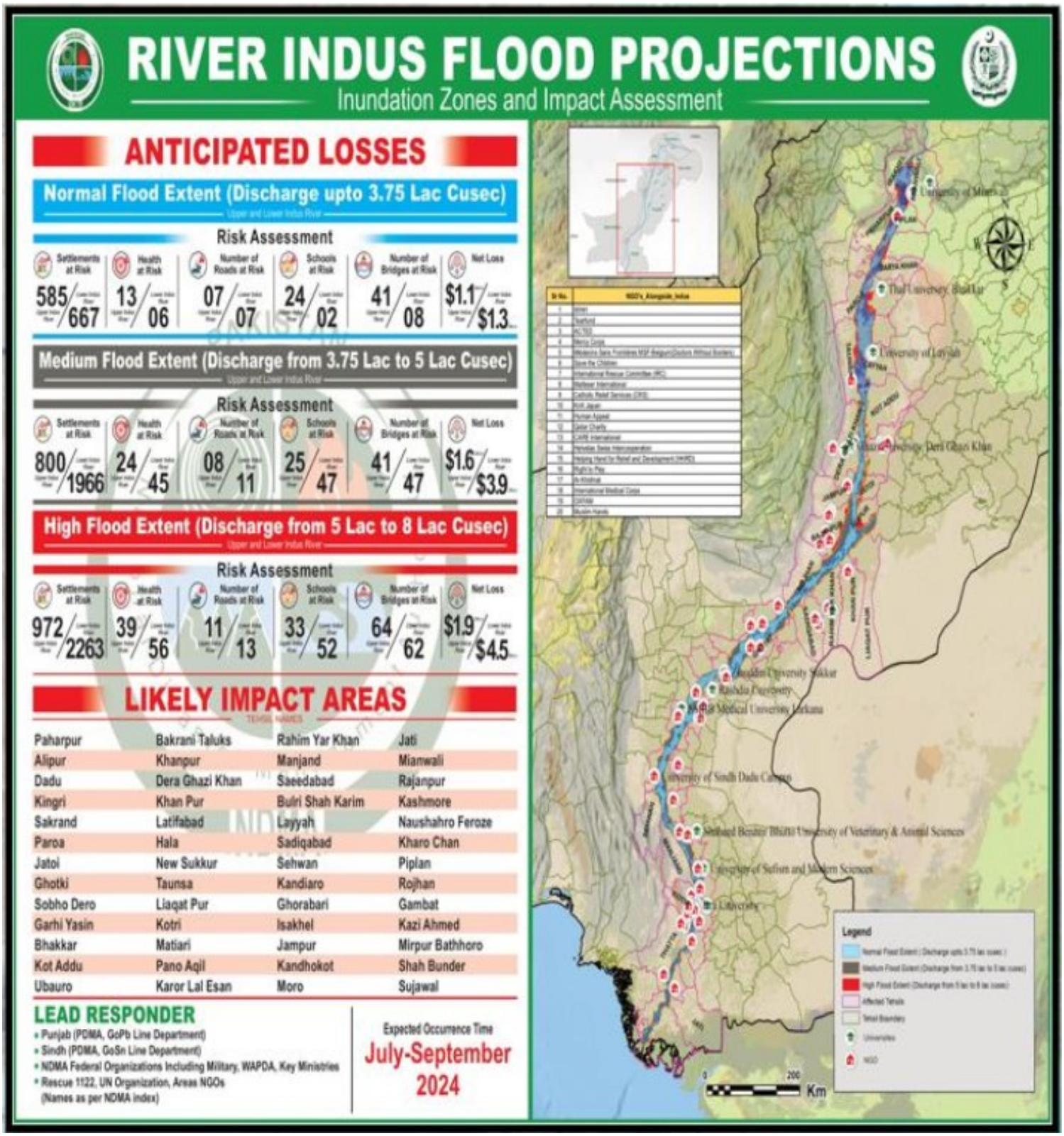
Annex-G

EASTERN RIVERS FLOOD INUNDATION MAP



Annex-H

RIVER INDUS FLOOD PROJECTION



Annex-I

RIVER KABUL FLOOD PROJECTION

RIVER KABUL FLOOD PROJECTIONS

Inundation Zones and Impact Assessment

ANTICIPATED EXPOSURE

Low Flood Extent (Discharge upto 70,000 Cusecs)

Exposed Elements

Settlements at Risk	Health at Risk	Number of Roads at Risk	Schools at Risk	Communication Towers at Risk	Number of Bridges at Risk
21	02	19	02	03	08

Medium Flood Extent (Discharge from 70,000 to 130,000 Cusecs)

Exposed Elements

Settlements at Risk	Health at Risk	Number of Roads at Risk	Schools at Risk	Communication Towers at Risk	Number of Bridges at Risk
28	04	120	11	12	37

High Flood Extent (Discharge from 130,000 to 200,000 Cusecs)

Exposed Elements

Settlements at Risk	Health at Risk	Number of Roads at Risk	Schools at Risk	Communication Towers at Risk	Number of Bridges at Risk
40	04	248	27	40	61

LIKELY EXPOSED AREAS

TEHSIL NAMES

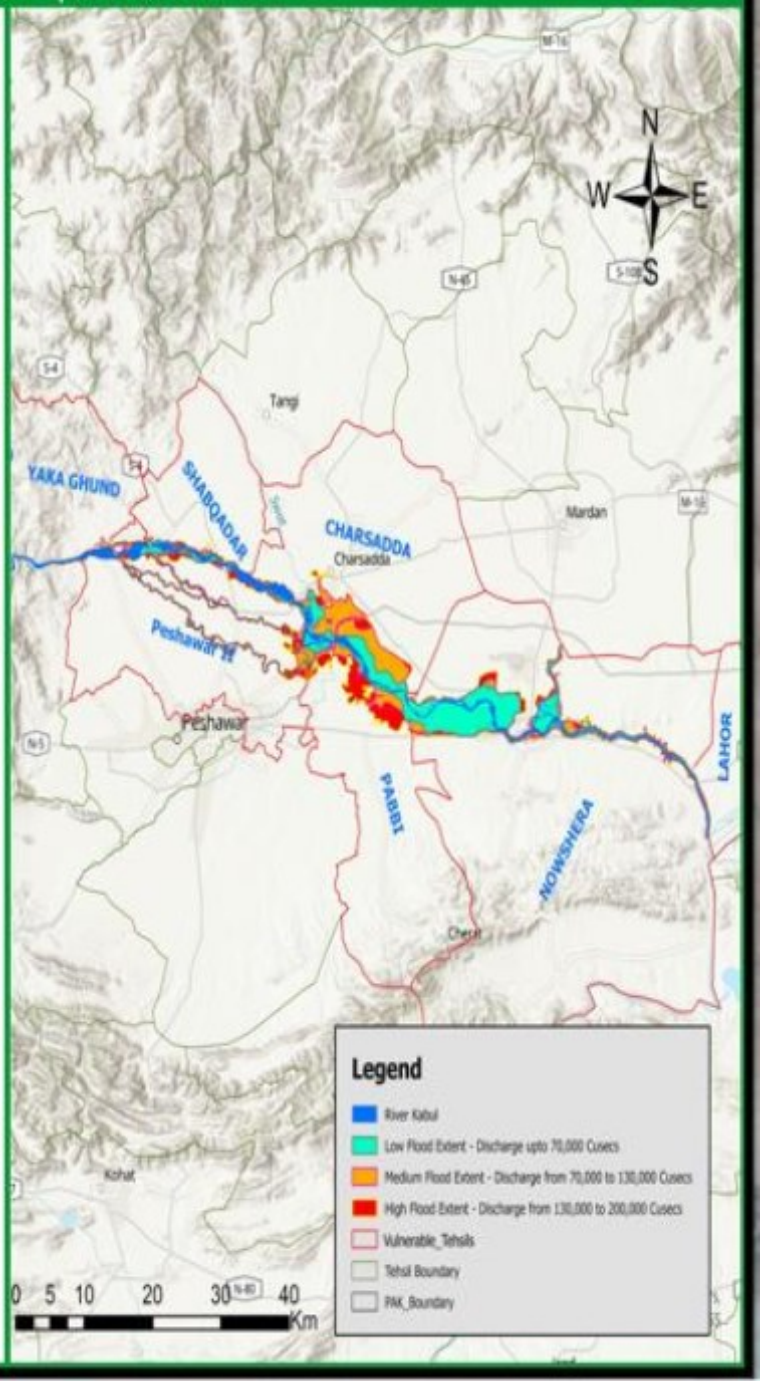
Yaka Ghund	Nowshera
Charsadda	Pabbi
Shabqadar	Lahor
Peshawar II	

LEAD RESPONDER

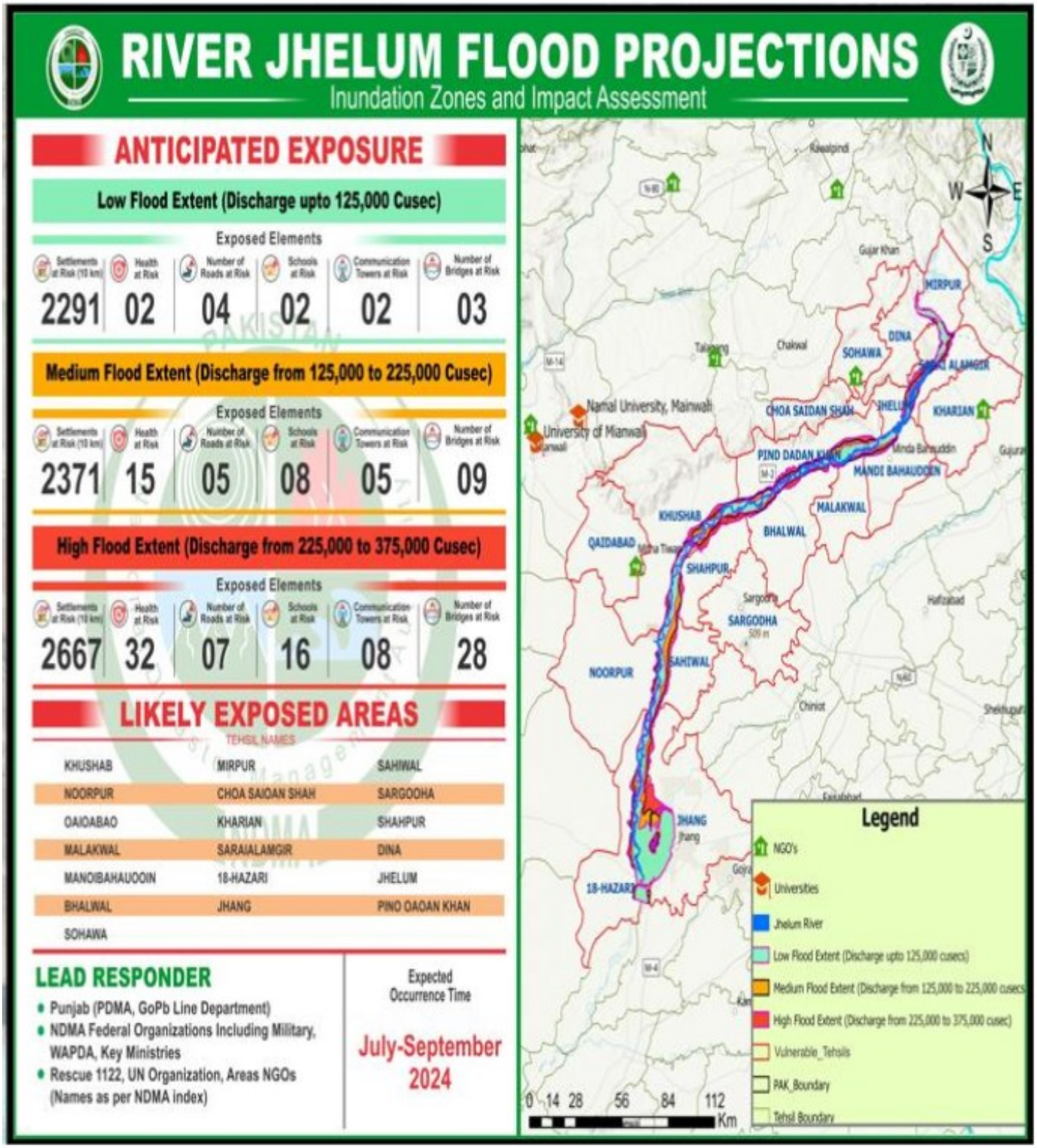
- Khyber Pakhtunkhwa (PDMA, GoKP Line Department)
- NDMA Federal Organizations Including Military, WAPDA, Key Ministries
- Rescue 1122, UN Organization, Areas NGOs (Names as per NDMA index)

Expected Occurrence Time

July-September 2024

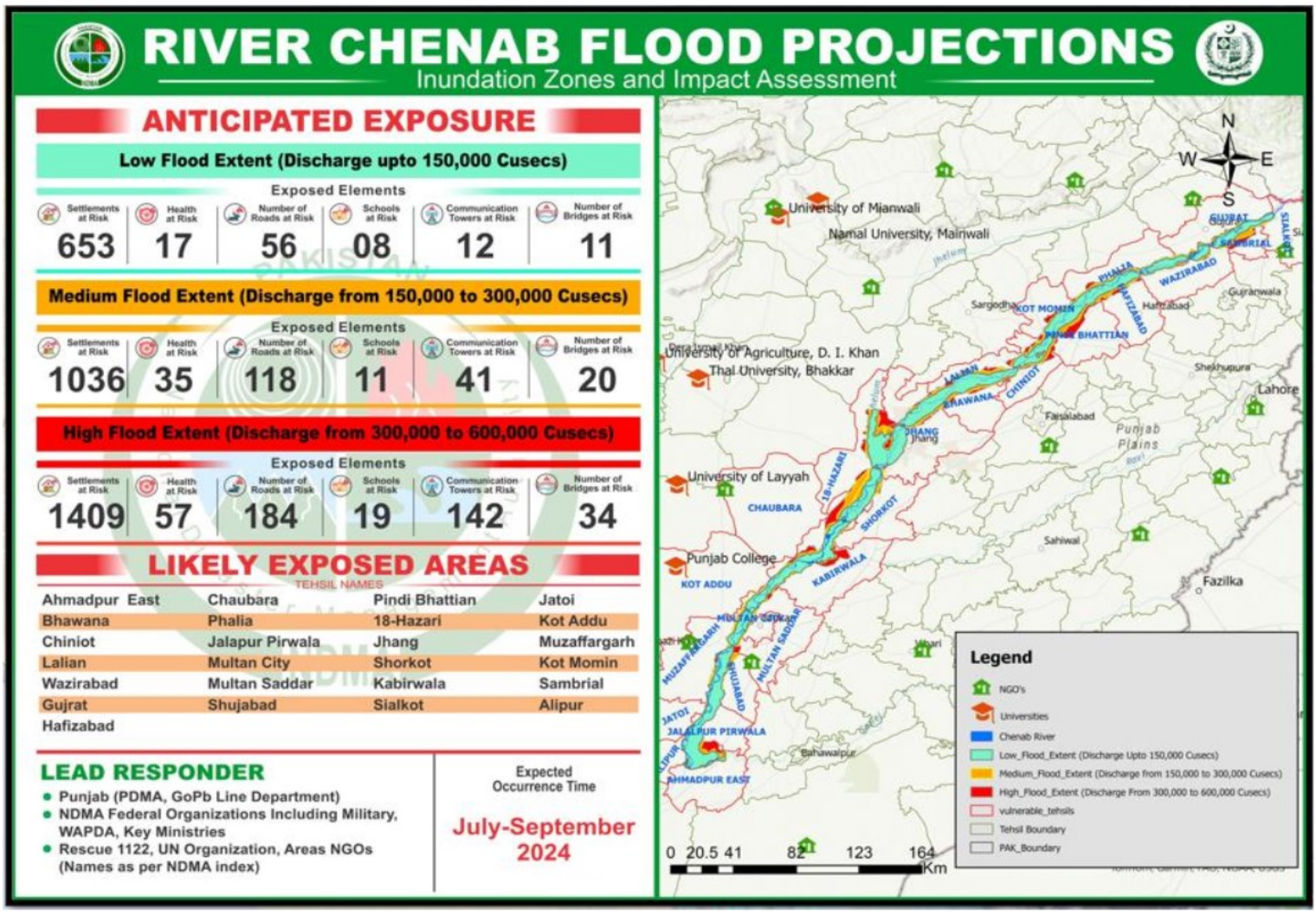


RIVER JHELUM FLOOD PROJECTION



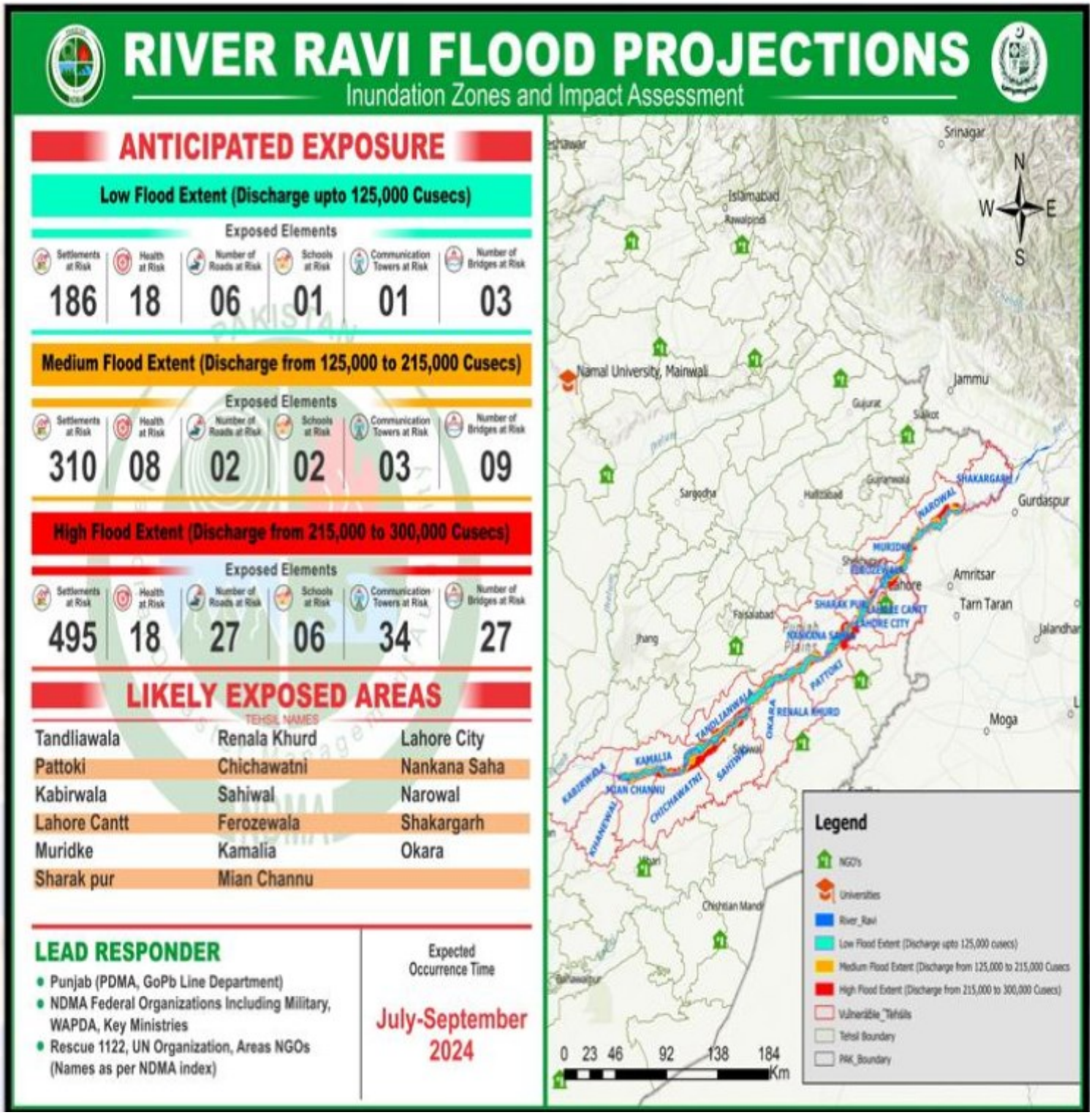
Annex-K

RIVER CHENAB FLOOD PROJECTION

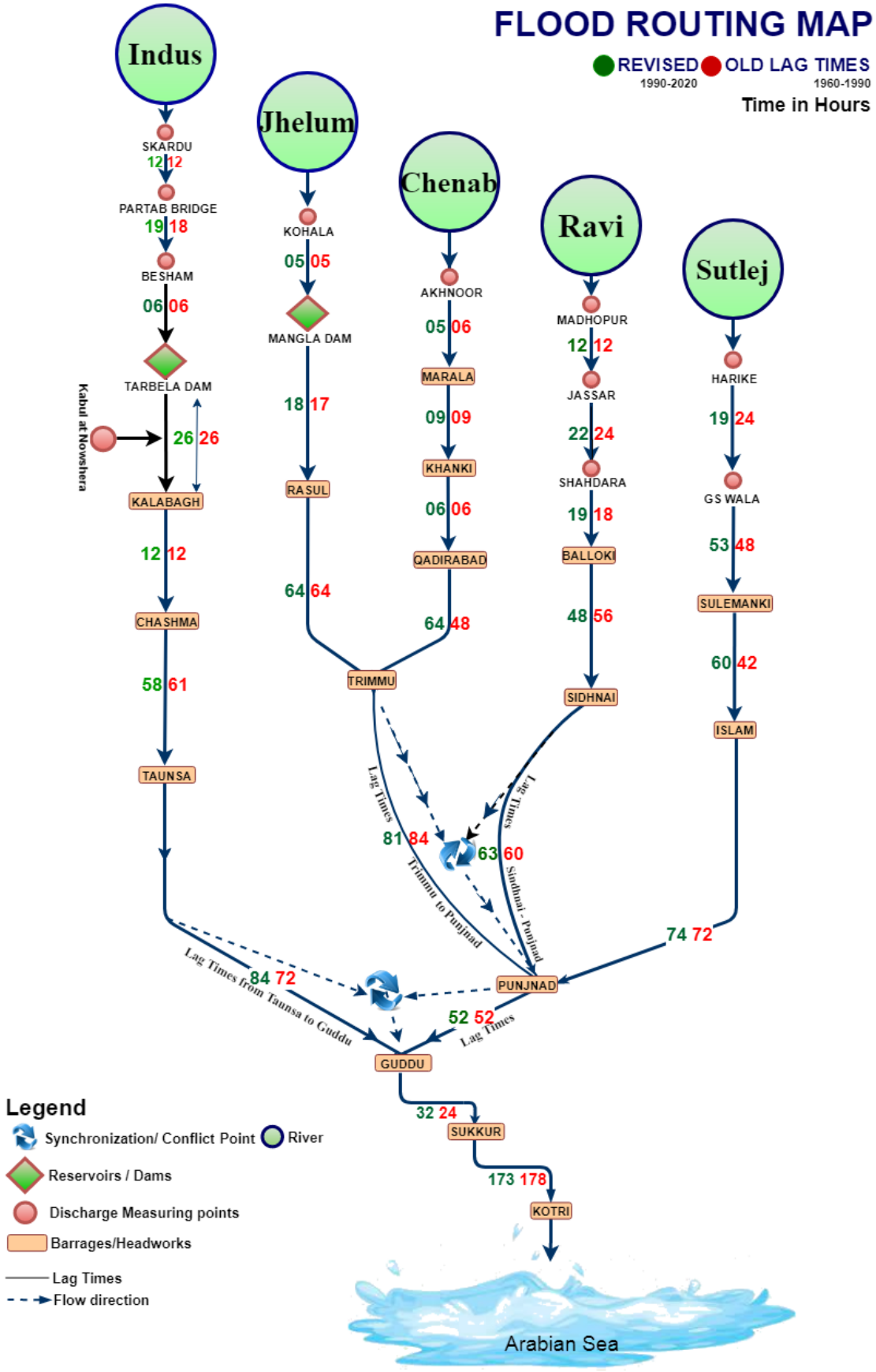


Annex-L

RIVER RAVI FLOOD PROJECTION



FLOOD ROUTING MAP



Chief Met FFD Lahore | Head of team: Sahibzad Khan

Flood Routing Map | Revised Lag Time Team

Team member: Akhtar Mahmood, Saqib Hussain, Mamoona, Ghulam Farid

Annex-N

FLOOD LIMITS OF HYDROLOGICAL STRUCTURES (CUSECS)

Rivers	Sites	Design Capacity	Flood Levels				
			Low	Medium	High	Very High	Extremely High
Indus	Tarbela	1,500.00	250,000	375,000	500,000	650,000	800,000
	Attock	-					
	Kalabagh	950,000					
	Chashma	950,000					
	Taunsa	1,000,000					
	Guddu	1,200,000	200,000	350,000		700,000	900,000
	Sukkur	900,000					
	Kotri	850,000		300,000	450,000	650,000	800,000
Kabul	Warsak	540,000	40,000	60,000	100,000	150,000	-
	Nowshera	-	60,000	90,000	140,000	200,000	-
Jhelum	Kohala	-	100,000	150,000	200,000	300,000	400,000
	Mangla	1,060,000	75,000	110,000	150,000	225,000	300,000
	Rasul	850,000					
Chenab	Jammu Tawi	-	20,000	70,000	83,000	170,000	-
	Akhnur	-	75,000	197,000	297,000	350,000	-
	Marala	1,100,000	100,000	150,000	200,000	400,000	600,000
	Khanki	800,000					
	Qadirabad	807,000					
	Chiniot Bridge	807,000					
	Trimmu	645,000	150,000	200,000	300,000	450,000	
	Panjnad	700,000					
Ravi	Jassar	275,000	50,000	75,000	100,000	150,000	200,000
	Ravi Syphon	450,000	40,000	65,000	90,000	135,000	180,000
	Shahdara	250,000					
	Balloki	225,000					
	Sidhnai	150,000	30,000	46,000	60,000	90,000	130,000
Sutlej	Sulemanki	325,000	50,000	80,000	120,000	175,000	225,000
	Islam	300,000					
	G.S. Wala	-					
Nullahs	**Sites**	**Design Capacity**	**Flood Levels**				
			Low	**Medium**	**High**	**Very High**	**Extremely High**
Bein	Chak Amru	-	1,300	7,000	20,000	30,000	35,000
	Shakargarh	-	1,600	3,000	24,000	26,000	43,000
Aik	Ura	-	2,000	9,000	13,000	16,000	33,000
Basantar	Jassar	-	4,100	4,700	7,500	11,600	17,800
Deg	Kingra Bridge	-	10,000	15,000	22,000	30,000	-
Palku	Wazirabad	-	2,500	3,100	5,000	25,000	26,000

Annex-O

SITUATION REPORT FORMAT FOR PROVINCES
MONSOON 2024 DAILY SITUATION REPORT NO - 001
(PERIOD COVERED: 1300 HRS __ June 2024 - 1300 HRS __ June 2024)

1. **Area Affected in Last 24 Hours**

Ser	District	Incident / Area Affected / Damage
a.		

2. **Extent of Damages**

a. **Damages (During Significant Events - Monsoon 2024)**

Ser	Category	Nos	Damaged/Washed Away/ Affected
(1)			

b. **Summary of Overall Preliminary Damages of Infrastructure & Private Properties**

District	Roads /Track	Bridge	Shop	Hotel	Masjid	Houses		Power Houses
						Partially Damage	Fully Damage	

c. **Preliminary Casualty - Death / Injured (from ____ to ____)**

District	Deaths				Injured			
	M	F	C	T	M	F	C	T

3. **Flood Relief Activities**

a. **Relief Camps Established**.

b. **Rescue Activities**.

c. **Aviation Activities**.

d. **Relief Activities**.

District	Tents	Food Items (Tons)	Blankets	Plastic mats	Sleeping bags

4. **Threat to Next Likely Areas**.

5. **River Discharges**.

6. **Rainfall recorded during Past 24 Hours**.

7. **Weather Forecast for Next 24 Hours**.