NATIONAL MONSOON CONTINGENCY PLAN 2023

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

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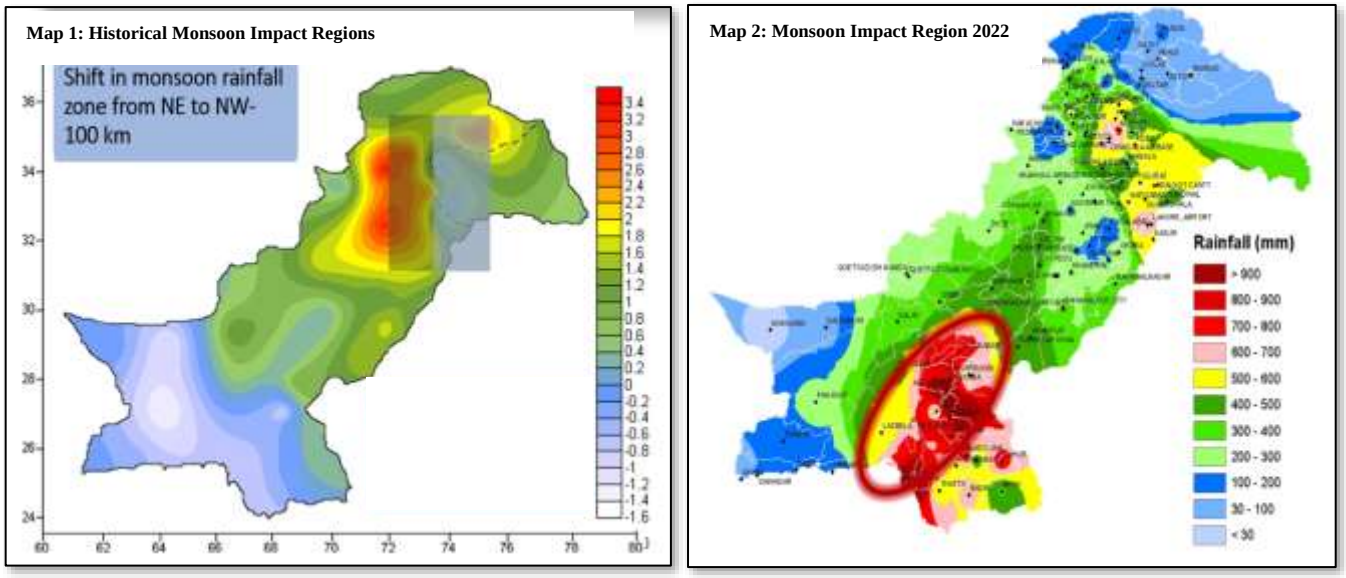
1. In 2022, Pakistan witnessed an unprecedented departure from its traditional Monsoon patterns, resulting in a series of devastating floods across the country. Unconventional weather phenomena brought forth a unique set of challenges including non-riverine rainfall flooding and inundation in Sindh and Balochistan; destructive hill torrents in Southern Punjab and Khyber Pakhtunkhwa; a combination of flash floods, hill torrents, and landslides in Balochistan; riverine floods triggered by a cloud burst in the North affecting Swat and Kabul rivers; and partial inundation in Punjab due to increased flow from Eastern rivers. In addition, Glacial Lake Outburst Floods (GLOFs) in Khyber Pakhtunkhwa and Gilgit-Baltistan resulted in numerous localized flooding incidents. The annual Monsoon season, which occurs from July to September in Pakistan, brings varying degrees of rainfall that predominantly affect Pakistan's northern regions. However, in 2022 the country witnessed a full-scale deviation in rainfall patterns as they shifted from the north to south of Pakistan, causing widespread impact across Pakistan. Maps 1 & 2 below indicate the traditional monsoon region vis-à-vis the shift in pattern in 2022: -



Map 1 & 2: Historical Monsoon Impact Regions vs Monsoon Impact Region 2022

2. National Disaster Management Authority (NDMA) under clause 9(a) and 9(b) of NDM Act 2010 (enclosed at **Annex A**) deals with complete spectrum of DM 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 had issued National Disaster Management Plan (NDMP) 2023 and National Disaster Response Plan (NDRP) 2019. In the same context, issuance of Monsoon Contingency Plan is a yearly practice, undertaken well before the start of Monsoon Season.

Figure 1: Disaster Risk Management Cycle

3. "National Monsoon Contingency Plan 2023" has been prepared in coordination with all DM stakeholders from federal to provincial levels. It is based on analysis of seasonal forecast by the PMD and likely impact of climate change. The plan lays down guidelines for all DM tiers and DM 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 2023. 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. This included convening the Strategic Coordination Forum meeting with the United Nations and other humanitarian partners, wherein their resources were identified and mapped out. Additionally, three Monsoon Preparedness Conferences and a National Simulation Exercise (Sim-Ex) were conducted to further enhance coordination among all stakeholders in anticipation of the forthcoming Monsoon season.

Overview of Monsoon 2022

4. **Forecast**. According to PMD's forecast, the country was expected to receive **Normal to Above Normal** precipitation during the season. However, Monsoon 2022 was unprecedented and triggered unique and diverse challenges for all DM stakeholders.

5. **Unfolding of Monsoon – 2022**. The season unfolded in following manner: -

   a. **Pre-Monsoon (15 - 30 June 2022)**. Pre-monsoon spell began in mid-June, with unprecedented snowfall in Azad Jammu & Kashmir, moderate to heavy rainfall in central regions of Punjab and isolated rains across Balochistan. The spell resulted in loss of cattle in AJ&K, with incidents of limited urban and flash flooding in Punjab and Balochistan, causing injuries to locals and minor damages to houses. The pre-monsoon spell pushed all DM responders in respective domains and tested preparatory measures. NDMA issued four advisories during this period and following details of losses and damages were received from PDMAs / SDMA / GBDMA and ICT administration (Table 1 & 2): -

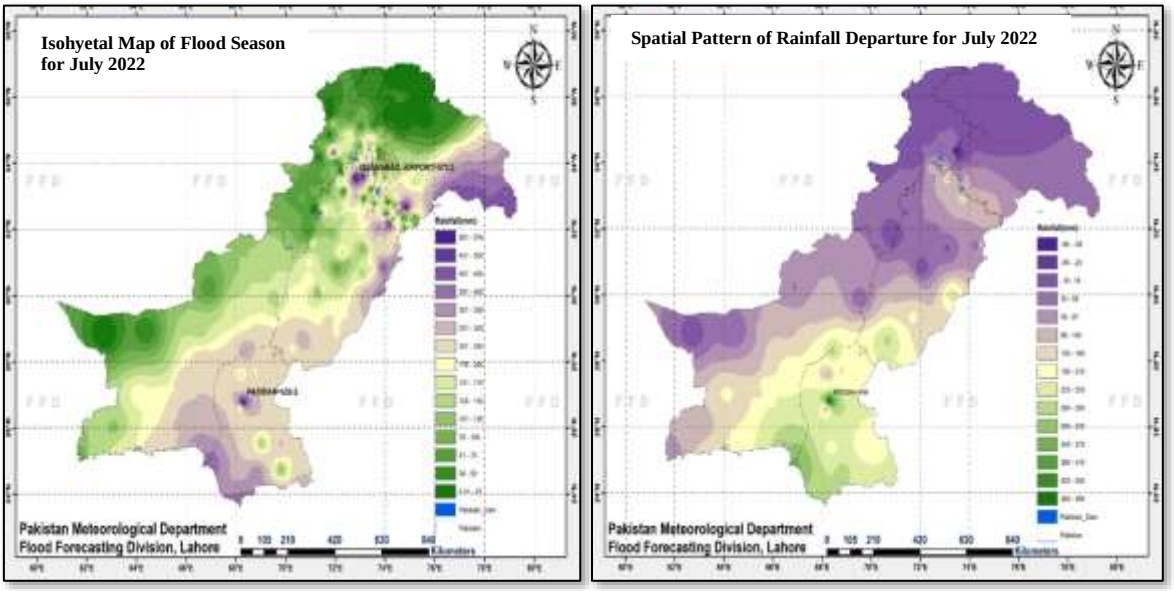
Provinces / State	Deaths				Injuries			
	M	F	C	T	M	F	C	T
AJ&K	2	-	-	**2**	1	-	-	**1**
Balochistan	3	8	1	**12**	17	5	6	**28**
GB	-	-	-	**-**	-	-	-	**-**
ICT	-	-	-	**-**	-	-	-	**-**
KP	5	2	6	**13**	6	9	5	**20**
Punjab	-	-	-	**-**	-	-	-	**-**
Sindh	2		6	**8**	-	2	3	**5**
Total	**12**	**10**	**13**	**35**	**24**	**16**	**14**	**54**

Table 1: Summary of Casualties - Deaths / Injuries (June 2022)

Provinces / State	Road	Bridge	Shop	Hotels	Houses		Livestock
					PD	FD	
AJ&K	-	-	1	-	1	52	730
Balochistan	1 km	5	-	-	15	2	366
GB	-	-	-	-	-	-	-
ICT	-	-	-	-	-	-	-
KP	-	-	-	-	215	53	139
Punjab	-	-	-	-	-	-	-
Sindh	-	-	-	-	-	-	-
Total	**1 km**	**5**	**1**		**231**	**107**	**1,235**

Table 2: Summary of Damages to Infrastructure, Private Properties and Livestock (June 2022)

b. **July 2022**. In continuation of the pre-monsoon spell, the rains in July also surpassed expectations with more rains recorded in North / Northeastern Punjab and parts of Sindh. During the month, maximum total rainfall was recorded at 573 mm in Islamabad Capital Territory and 535 mm in Padidan, District Noushero Feroze, Sindh. Spatial distribution of significant rainfall during July 2022 is illustrated in Maps 3 & 4 below and cumulative losses / damages for this month are detailed in Table 3 & 4**: -**



Map 3 & 4: Spatial Distribution of Significant Rainfall Map and Rainfall Departure Map (July 2022)

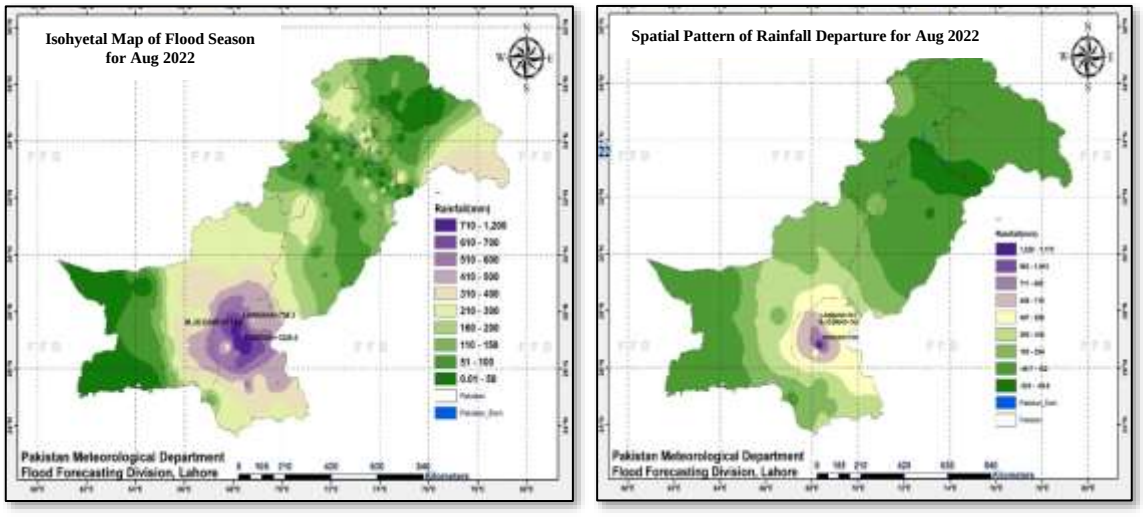
Provinces / State	Deaths				Injuries			
	M	F	C	T	M	F	C	T
AJ&K	5	1	1	**7**	4	4	0	**8**
Balochistan	47	23	45	**115**	29	5	8	**42**
GB	1	4	3	**8**	3	0	0	**3**
ICT	1	0	0	**1**	0	0	0	**0**
KP	19	14	37	**70**	107	35	21	**163**
Punjab	56	15	31	**102**	150	90	35	**275**
Sindh	45	6	45	**96**	28	15	17	**60**
Total	**174**	**63**	**162**	**399**	**321**	**149**	**81**	**551**

Table 3: Summary of Casualties - Deaths / Injuries (July 2022)

Provinces / State	Road	Bridge	Shop	Hotels	Houses		Livestock
					PD	FD	
AJ&K	0	0	4	20	59	28	11
Balochistan	579	8	0	9969	3336	13318	22647
GB	2	50	0	162	283	445	0
ICT	0	0	0	0	0	0	0
KP	6.5	5	0	2768	531	3461	132
Punjab	0	0	1	77	6	83	12
Sindh	408.5	5	6	16071	2956	19027	383
Total	**996**	**66**	**11**	**29067**	**7171**	**36362**	**23185**

Table 4: Summary of Damages of Infrastructure, Private Properties and Livestock (July 2022)

c. **August 2022**. August saw shift of Monsoon rains towards southern regions resulting in heavy rains and widespread inundation and hill torrents affecting South Punjab, eastern Balochistan and the Sindh province. Simultaneously, posed additional challenge due to isolated heavy downpours in north, causing riverine / flash floods and GLOFs in upper / central KP and GB, resulting in extensive damage to infrastructure. During August, maximum total rainfall was recorded at 1,229 mm in Padidan, District Noushero Feroze, Sindh and 780 mm in Mohenjo-Daro, District Larkana, Sindh. Maps 4 & 5 below show the spatial distribution of rainfall in August 2022 and Table 5 & 6 detail the losses / damages for the month: -



Map 4 & 5: Spatial distribution of Significant Rainfall and Rainfall Departure Map (August 2022)

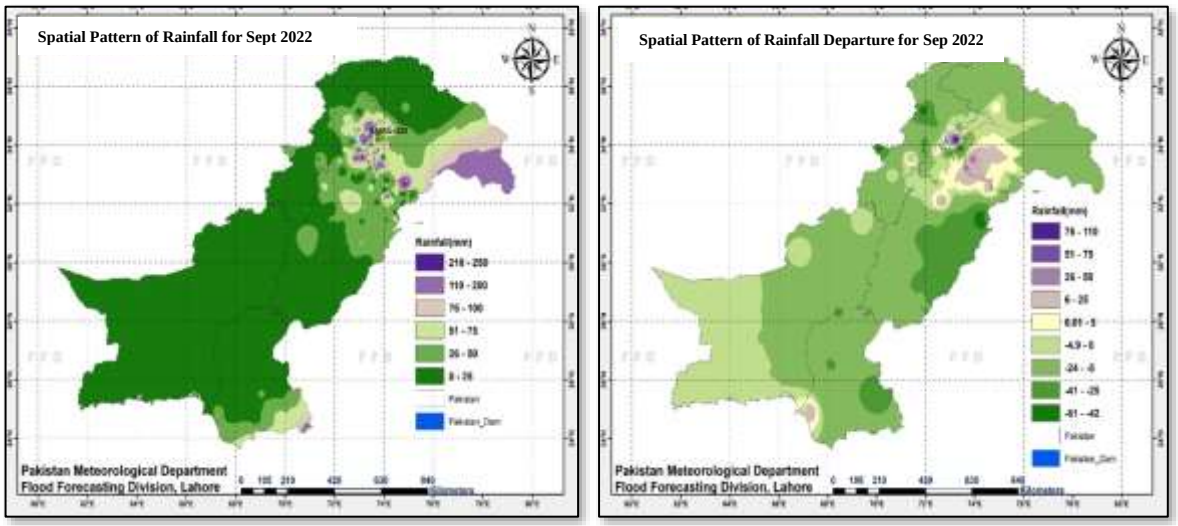
Provinces / State	Deaths				Injuries			
	M	F	C	T	M	F	C	T
AJ&K	22	13	0	**34**	11	2	0	**13**
Balochistan	74	36	28	**138**	57	30	35	**122**
GB	4	7	3	**14**	0	0	3	**2**
ICT	0	0	0	**0**	0	0	0	**0**
KP	103	22	69	**194**	21	40	103	**164**
Punjab	35	41	10	**86**	1,187	415	146	**1,748**
Sindh	110	64	128	**326**	606	250	185	**1,041**
Total	**348**	**183**	**238**	**792**	**1,882**	**737**	**472**	**3,090**

Table 5: Summary of Casualties - Deaths / Injuries (August 2022)

Provinces / State	Roads (km)	Bridges	Shops	Houses			Livestock
				PD	FD	Total	
AJ&K	0	0	16	177	224	452	779
Balochistan	421	10	0	34,141	14272	48,400	4,77,353
GB	14	15	8	270	220	490	0
ICT	0	0	0	0	0	0	0
KP	1,582.5	79	0	39,960	29702	69,500	9,279
Punjab	130	16	99	29,653	16584	46,237	2,05,092
Sindh	1,919.5	55	39	6,00,268	304650	9,04,918	16,130
Total	**4,067**	**177**	**162**	**7,04,469**	**365652**	**10,69,997**	**7,08,633**

Table 6: Summary of Damages of Infrastructure, Private Properties and Livestock (August 2022)

d. **September 2022**. September brought with it light to moderate rains, primarily over North & Northeast Punjab, Khyber Pakhtunkhwa, AJ&K and Southeast Sindh. The intensity of rains weakened with many regions of Pakistan remaining cloudless. Maximum total rainfall of 229 mm was recorded in Kakul, District Abbottabad, Khyber Pakhtunkhwa, 178.82 mm in Kotli, AJ&K and 173.99 mm in Domel, District Bannu, Khyber Pakhtunkhwa. Maps 5 & 6 display the spatial rainfall in September 2022 and Tables 7 & 8 summarize the cumulative losses and damages for the month:-



Map 5 & 6: Spatial distribution of Significant Rainfall and Rainfall Departure Map (September 2022)

Provinces / State	Deaths				Injuries			
	M	F	C	T	M	F	C	T
AJ&K	9	4	1	**14**	4	7	0	**11**
Balochistan	75	44	79	**198**	40	10	15	**65**
GB	1	5	3	**9**	4	0	0	**4**
ICT	1	0	0	**1**	0	0	0	**0**
KP	47	19	47	**113**	134	39	31	**204**
Punjab	57	9	69	**135**	986	698	426	**2,110**
Sindh	186	76	193	**431**	2,358	1,961	3,062	**7,381**
Total	**376**	**157**	**392**	**901**	**3,526**	**2,715**	**3,534**	**9,775**

Table 7: Summary of Casualties - Deaths / Injuries (September 2022)

Provinces / State	Roads (km)	Bridges	Houses			Livestock
			PD	FD	Total	
AJ&K	0	33	51	103	103	13
Balochistan	1,777	14	18,067	5,755	23,835	22,647
GB	2	50	366	355	721	0
ICT	0	0	0	0	0	0
KP	0	107	13,978	7,823	21,963	12,049
Punjab	766	0	12,474	9,270	21,744	14
Sindh	6,469.5	110	5,28,456	3,78,530	9,06,986	4,16,722
Total	**9,014.5**	**233**	**5,73,392**	**4,01,836**	**9,75,352**	**4,51,445**

Table 8: Summary of Damages of Infrastructure & Private Properties and Livestock (September 2022)

6. **Cumulative Damages / Losses**. Summary of damages / losses caused by Monsoon Floods 2022 in Pakistan is given in Table 9 and Table 10: -

Provinces / State	Deaths				Injured			
	Male	Female	Child	Total	Male	Female	Child	Total
ICT	1	0	0	**1**	0	0	0	**0**
Bln	149	80	107	**336**	97	40	50	**187**
KP	151	42	116	**309**	157	79	134	**370**
Punjab	92	51	80	**223**	2,173	1,113	572	**3,858**
Sindh	310	151	338	**799**	2,964	2,211	3,247	**8,422**
GB	5	12	6	**23**	3	0	3	**6**
AJ&K	31	17	0	**48**	15	9	0	**24**
Total	**739**	**353**	**647**	**1,739**	**5,409**	**3,452**	**4,006**	**12,867**

Table 9: Summary of Losses - Monsoon (2022)

Provinces/ State	Roads (km)	Bridges	Houses			Livestock	Agri-Land Affected (ha)
			PD	FD	Total		
ICT	-	-	-	-	-	-	-
Bln	2,222	58	125,837	115,822	241,659	500,000	264,269.34
KP	1,575	107	53,939	37,525	91,464	21,328	37,279.18
Punjab	877	15	42,127	25,854	67,981	205,106	189,359.21
Sindh	8,389	165	1,168,210	716,819	1,885,029	436,435	1,029,001.85
GB	33	61	1,126	667	1,793	609	39,904
AJ&K	19	33	228	327	555	792	-
Total	**13,115**	**439**	**1,391,467**	**897,014**	**2,288,481**	**1,164,270**	**1,559,813.59**

Table 10: Summary of Damages - Monsoon (2022)

7. **Actions Taken by NDMA (Monsoon 2022)**

a. **Preparedness Measures**

(1) **Post Monsoon 2021 Review**. Every year after monsoon, NDMA conducts an annual Post-Monsoon Coordination Conference, which is aimed to assess the measures taken and lessons learnt during the past season so that a refined and comprehensive plan can be developed for upcoming season. National Post Monsoon Coordination Conference 2021 was conducted on 14 December 2021 where all the participants highlighted the issues faced during the season and best practices were highlighted for information of all.

(2) **Series of Collaborative Sessions / Exercises**. In light of the need to have comprehensive collaborative measures for preparations and response to likely monsoon hazards, NDMA organised 3 x preparation conferences which culminated with a National Sim-Ex. The important aspects of each conference and the Sim-Ex are given in Figure 2 below: -

Figure 2: Timelines of Monsoon Preparedness Conferences and Sim-Ex 2022

b. **Activation of NEOC and AFCC**. National Emergencies Operation Centre (NEOC) and Army Flood Control Centre (AFCC) remained active for round the clock monitoring of developing situation in the country.

c. **Establishment of EOCs**. For monitoring and maintaining coordination with NEOC, all concerned departments / ministries / organisations, PDMAs / SDMA / GBDMA and ICT administration established and maintained respective EOCs in light of NDRP and National Monsoon Contingency Plan 2022.

d. **NDMA's Daily Situation Report**. To have uniform national reporting mechanism, NEOC issued daily SITREPs, which were prepared based on the information and SITREPS of all concerned departments / authorities.

e. **Deployment of Earth Moving Machinery**. Timely placement of heavy earth moving machinery was ensured at key locations for clearance of landslides / debris especially along National Highways.

f. **Synchronised Response Mechanism**. Based on National Monsoon Contingency Plan - 2022 and in line with NDRP, NEOC coordinated among all stakeholders for proactive and synchronised response. Following are some major aspects in this regard: -

(1) **Aviation Support for Immediate Rescue and Relief**. NDMA coordinated aviation support from Pakistan Army / Navy / Air Force for rescue and relief activities.

(2) **Resource Mobilisation**. Based on information and need for augmentation of resources, NEOC issued directions and ensured coordinated for resource mobilisation from neighbouring districts, organisations and from Armed Forces.

(3) **Issuance of Advisories / Alerts**. In light of information provided by PMD, FFD, FFC and PCIWR about weather and river flows, NDMA issued timely advisories and alerts on need basis, which highlighted the measures required by all DM stakeholders during impending situation.

(4) **Coordination with Reservoir Management Authorities**. In light of river flow and precipitation information provided by PMD, FFD, FFC and PCIWR on levels, likely trends and weather, NDMA coordinated with reservoir management authorities for ensuring that the discharge from each is deconflicted and regulated in a manner to preclude riverine flooding in the downstream.

(5) **Conduct of Daily NEOC Sessions**. NEOC began conducting daily update sessions with effect from 15 June 2022 on developing situation so that an informed decision-making process can be followed at national level.

g. **Provision of Relief Items**. In view of widespread damages across Pakistan and affected population, NDMA executed a comprehensive, detailed and inclusive response plan to address the needs of affected population. Summary of major relief items provided by NDMA is given in **Annex B**.

h. **Conduct of PDNA**. In aftermath of unprecedented damages caused during monsoon / floods 2022, NDMA conducted Post Disaster Needs Assessment (PDNA) for developing comprehensive road map for national and international organisations who were to be engaged for extending assistance to flood affected population.

i. **Coordination for International Relief Assistance**. After the launch of international appeal for relief assistance, a large number of countries / organisations commenced provision of relief items through land, sea and air means. NDMA established a comprehensive reception, stocking, transportation and distribution of relief items. Summary of major international relief items provided by NDMA is given in **Annex C**.

j. **Conduct of JS / DA**. To correctly assess the damages and losses during floods 2022, all federating units declared affected areas / districts as 'Calamity Hit' regions. In order to assess the overall impact of foods, a Joint Survey and Damage Assessment process was undertaken on directions of Prime Minster. NDMA issued guidelines and deputed monitoring teams for conduct of JS / DA, which was led by Provincial governments with assistance of Pakistan Army.

8. **Critical Limitations / Challenges**. Critical limitations and challenges observed in the response mechanism against flood hazards in 2022 are to be kept in sight by all stakeholders while planning and preparing respective flood response plans for Monsoon 2023: -

a. **Comprehensive Flood Telemetry System**. Information flow from the catchment areas is limited due to scant telemetry stations, especially for regions vulnerable to flash floods and hill torrents.

b. **Weather Stations**. Less number of weather stations results in inaccurate data feeding / recording hence preclude comprehensive planning process. Similarly, due to limited number of weather stations, precipitation in various regions goes unnoticed and results in surprise flash floods / hill torrents or increased flow in canals for water which cannot be managed downstream.

c. **Capacity of DDMAs**. In most of the districts, dedicated human resource for DM is not available that weakens the most important response tier. The gap at this critical tier causes an immediate pull on provincial and national resources especially the employment of Armed Forces.

d. **Limited Inventory of Heavy Machinery / Equipment**. Non-availability of sufficient number of heavy earth moving machinery remains a hindrance in hilly / mountainous regions of GB, KP, Balochistan & AJ&K. The challenge is compounded during bad weather conditions where long distance movements are involved.

e. **Partial Vulnerability / Hazard Assessment**. There is a dire need to undertake detailed Multi-Hazard Vulnerability and Risk Assessments (MHVRAs) to prepare hazard atlas of Pakistan. In view of the same, it has been observed that though the efforts are being duplicated at federal and provincial levels but still they are not comprehensive to assess full scale of vulnerabilities.

f. **Non-Availability of Dedicated Aviation Assets for DM**. Aviation assets of Armed Forces and Ministry of Interior are employed for rescue and relief efforts as helicopters of Pakistan Navy and Pakistan Air Force are normally not employed in northern areas. Aviation assets of Pakistan Army are extensively employed in security operations as well and therefore, these limitations have pronounced bearing on initiation of timely disaster rescue and relief activities.

g. **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.

h. **Insufficient Desilting 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.

Aim

9. To formulate national response guidelines for all disaster management stakeholders at national and provincial / state level for proactive and inclusive preparations and effective response to any flood like situation as per contingencies based on PMD's Monsoon Seasonal Forecast 2023 and other likely emergencies in the country.

Scope

10. 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) PMD's Monsoon Seasonal Outlook 2023.

(2) Perceived Impacts of Monsoon Outlook 2023.

(3) Monsoon 2023 Contingencies.

(4) Provincial / District Hazard and Vulnerability Maps.

(5) FFD Flood Routing Map (Lag time).

c. **Part III - National Guidelines for Monsoon 2023**

(1) Preparedness Phase.

(2) Response Phase (Rescue and Relief).

(3) Early Recovery Phase.

(4) Coordination Aspects.

d. **Part IV - Response Guidelines for Drought**

(1) National Response Guidelines against Drought.

PART I - ORGANIZATIONAL RESPONSIBILITIES

Responsibility Matrix for Flood Management

11. 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 2023, NDRP 2019 and National Monsoon Contingency Plan 2023 issued on regular / seasonal basis. Figure 3 below represents the sequence of actions by different stakeholders and the overall paradigm of responsibility matrix: -

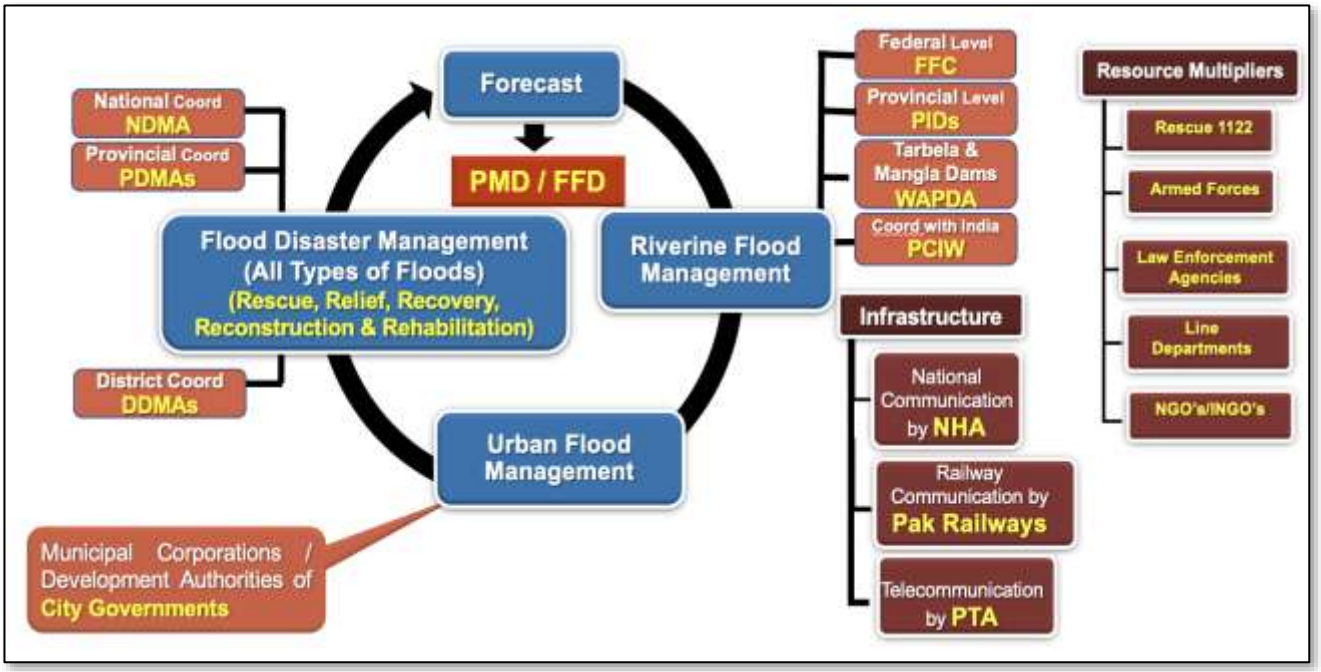


Figure 3: Responsibility Matrix for Flood Management

Salient Aspects

12. 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. **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. **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. **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. **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. **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. **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. **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

13. During the Monsoon season and ensuing floods of 2022, various challenges were encountered by stakeholders at different levels, providing valuable opportunities for learning. 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 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, time lag of riverbeds does not cater for on ground intrusions into riverbed 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. **Availability of Dedicated Aviation Assets**. The need for dedicated aviation assets for disaster management was highlighted numerous times by media and Parliamentarians during Monsoon 2022. It is imperative that concerned authorities advocate for the same to facilitate timely rescue and relief operations, particularly in remote areas.

l. **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.

m. **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.

n. **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.

o. **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.

PART II - SEASONAL OUTLOOK AND SCENARIOS

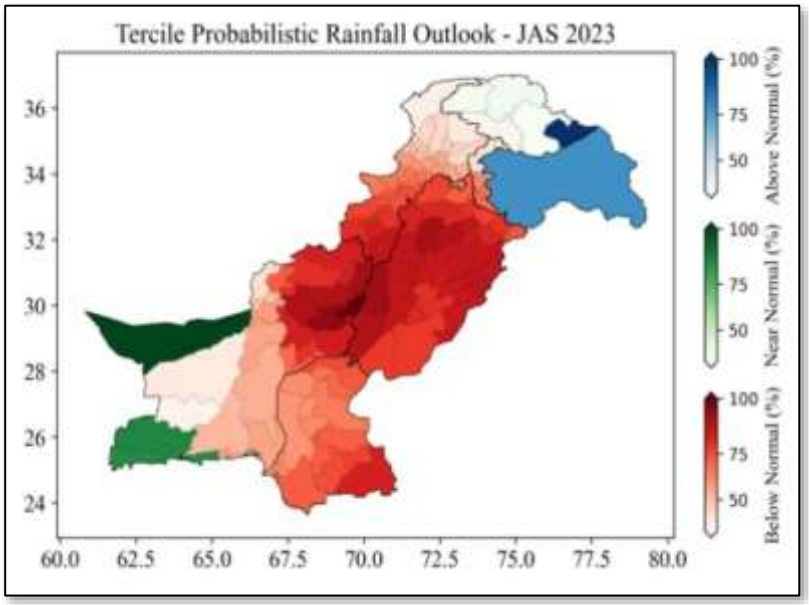
Monsoon Outlook 2023

14. According to PMD's Monsoon Outlook 2023, i.e. July-August-September (JAS), it is anticipated that El Nino conditions will prevail, with a consistently positive IOD. Based on the global and regional circulation patterns, the seasonal outlook for Pakistan is as under: -

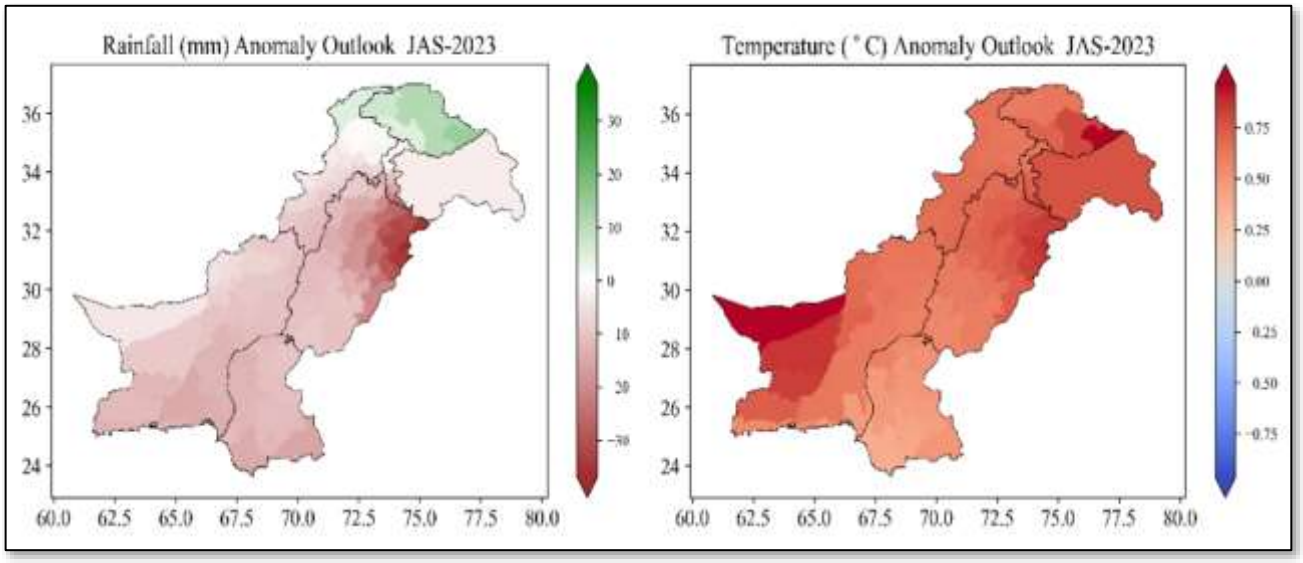
a. The climatic conditions indicate normal to below normal rainfall for most parts of the country.

b. Some areas in Northern Pakistan may receive slightly above normal rainfall, while western parts of Baluchistan may experience near normal rainfall during the forecast season.

c. Seasonal average temperatures will mostly fall within the normal to higher-than-normal range.



Map 7: Tercile Probabilistic Rainfall Outlook (PMD)



Map 8 & 9: Rainfall Anomaly Outlook & Temperature Anomaly Outlook (PMD)

Perceived Impacts of Monsoon Seasonal Outlook 2023

15. Under the influence of predicted climatic conditions, following impacts are envisioned: -

a. Above normal temperatures, likely in high altitude / northern areas which will increase snowmelt, thereby increasing the chances of greater inflow for reservoirs / Indus-basin.

b. Low rainfall and increasing temperatures may result in a gradual reduction in soil moisture in agricultural plains. Hence, requiring additional measures for water management for irrigation during Kharif crops and vegetables, particularly in the southern half of the country.

c. Due to increased temperatures, northern areas will be susceptible to GLOFs and avalanches.

d. Due to above normal rainfall in the catchment areas of Eastern rivers, sudden release of water from across the border can be experienced.

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

(1) Flash flooding; in mountainous regions of KP, AJ&K, Balochistan, GB and in district Murree of Punjab.

(2) Hill torrents; in vulnerable areas of South Punjab, Eastern Balochistan and South KP.

(3) Urban flooding in major metropolitans of the country.

(4) Extreme hydro-meteorological events over catchment areas are likely to generate unprecedented flows for reservoirs and may generate riverine floods.

Monsoon 2023 Contingencies

16. **Visualized Contingency Scenarios**. Monsoon's visualised contingency scenarios, derived from PMD's Outlook for Monsoon 2023 are as under: -

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

(1) Most regions, across the country will experience below normal precipitation.

(2) Under less rainfall, temperatures will remain higher than normal / historical averages.

(3) Increased snowmelt and resultant high flow in rivers will be experienced.

(4) Soil moisture, especially in the plains, will reduce.

(5) Possible stress on water reservoirs will be experienced under increased demand from irrigation lands.

(6) Extreme weather patterns i.e. cloud bursts, hailstorm, windstorms may develop during the season.

(7) Urban flooding in metropolitans will be possible only under climate induced heavy precipitation in the area.

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

(9) Cyclonic activity may remain active, affecting the coastal regions.

(10) Regions already affected by floods 2022, may not be under stress again due to monsoon rains.

b. **Scenario-2 (Likely) - Normal**. It may unfold as under: -

(1) The precipitation pattern across the country remains close to normal.

(2) The rainfall remains evenly distributed across the country.

(3) Due to normal conditions, temperatures also remain stable.

(4) Soil moisture remains stable and hence does not demand extra water from canals / reservoirs.

(5) Possibility of isolated weather events remains higher and may result in localised seasonal hazards across the country.

(6) Water flow in rivers remains consistent due to steady snowmelt.

(7) Inflow in reservoirs remains normal with less stress on water needs.

(8) GLOF incidents will become less likely under normal temperatures.

(9) Cyclonic activity may remain normal.

c. **Scenario-3 (Less Probable) - 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 heavy downpours in short time span.

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

(4) Increased cyclonic activity in Arabian Sea may compliment Monsoon.

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

d. **Scenario-4 (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 and Vulnerability Maps

17. Hazard and vulnerability maps 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. Monsoon hazard maps are attached as **Annex D – H**.

FFD Flood Routing Map (Lag time)

18. Flood lag times as per FFD are shown in routing model attached as **Annex I.**

PART III - NATIONAL GUIDELINES FOR MONSOON 2023

Overview of Disaster Management Structure

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

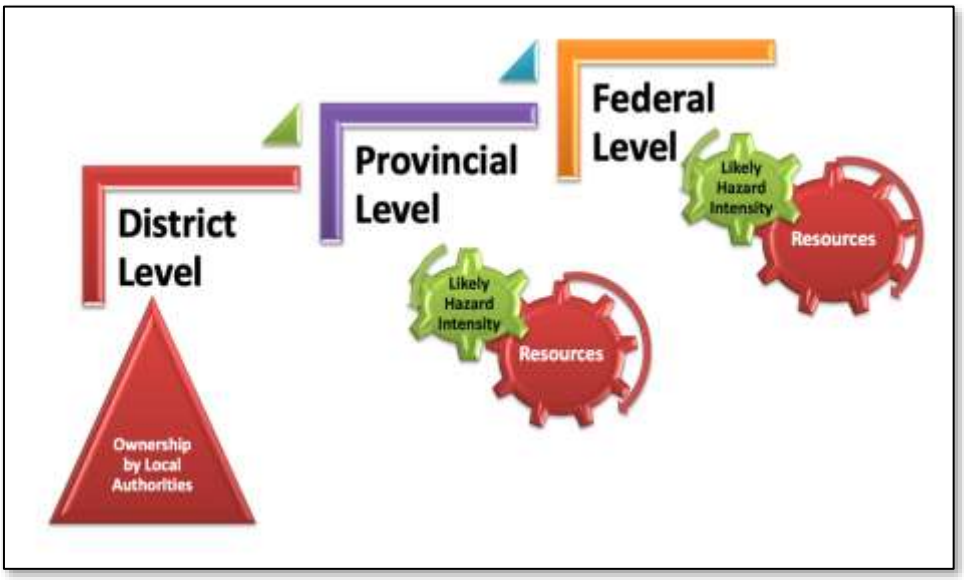


Figure 4: Three-tiered Response Mechanism Following Bottom-Up Approach

Preparedness Phase

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.

Figure 5: Disaster Management Cycle

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 standardized SITREP format (**Annex J**) for reporting and enhance incident reporting mechanisms for increased efficiency.

(16) **Updating of Databases**. DDMAs to update miscellaneous data which may

be needed during disaster response, e.g. database of volunteers, miscellaneous resources etc.

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 identified 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 currently passed, owing to changes in temperature, the possibility of such events cannot be completely ruled out. 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 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 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.

(7) PMD will also conduct critical analysis of contributing factors for drought in arid zones of the country and timely intimate the same to NDMA and other relevant stakeholders.

b. **Community Early Warning through Advisories**

(1) Public Service Messages (PSMs) must be generated forthwith by PDMAs, SDMA, GBDMA 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 (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 effort should be requisitioned through NDMA / PAF by respective Provincial Governments and AJ&K, with expenditures to be borne by the respective province / regions.

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 equipped with flood rescue equipment and specialized swift water rescue gear for rapid response in flash flood-prone areas.

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

(5) Utilize early warning systems, including sirens 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 Pakistan Army USAR team support, if required for specialized rescue operations in flash flood scenarios.

(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. All supporting agencies must maintain the capability based on the need of the provinces.

(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 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 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 (**Annex K**). 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 / counseling 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 centers 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 centers 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

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) **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.

(2) **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.

(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 damage assessments to identify priority areas for early recovery interventions, focusing on emergency shelter, medical support and search and rescue operations.

(b) Provide immediate support for the rehabilitation and reconstruction of damaged infrastructure, including roads and transportation routes.

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

(d) Implement early warning systems tailored for landslides and avalanches to enhance preparedness and reduce future risks.

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

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

(g) 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 2023, 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 2023.

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. Facility of a cloud-based video conference systems e.g. Google Meet, Microsoft Teams, WebEx & Zoom etc. is available at NDMA. Necessary hardware (Cameras) and Software are held with PDMAs to connect to the NDMA, the preferred mean is of Zoom system. Same may be utilized for effective communication during Monsoon 2023. Necessary details of the system are as under: -

(1) **Point of Contact (POC)**: ICT Directorate NDMA.

(2) **Alternate Skype ID**: ndmapk.

(3) Prior coordination for setting up of video conference besides its testing is required as per SOP.

f. **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 2023 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, Seylani etc) will share location of their stocks and human resource mapping with NDMA / PDMAs by 30 June 2023.

e. Important telephone numbers from NDMA perspective are shared at **Annex L**. All PDMAs / relevant stakeholders will share telephone directory of respective Provinces / Regions with NDMA and host it at respective website by 25 June 2023.

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 telecos 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 in collapsed structures and landslides / avalanches by USAR team and immediate support as per regional presence and 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.

f. Mr. Idrees Mahsud, Member (DRR), NDMA is authorized spokesperson of NDMA and can be reached at 0340-6003337 whereas Mr Zaheer Babar, Chief Meteorologist is the focal person from PMD and can be reached at 0321-5023944 / 051-9250365.

PART IV - RESPONSE GUIDELINES FOR DROUGHT

National Response Guidelines against Drought

32. It is pertinent to highlight that Below Normal to near Normal Monsoon in second half may result into drought like conditions in arid zones of South Punjab, Sindh and Western Balochistan. All relevant stakeholders will continuously monitor the situation as per Drought Mitigation Plan Matrix given at **Annex M**. Following additional measures will also be considered:-

a. In line with envisaged caseloads, food reserves will be maintained.

b. Caseload for vulnerable groups be planned as per assessment, addressing their needs.

c. Vulnerability of livestock along with the requirement of fodder and medicines must factor in all plannings and executed in case of need.

d. Supply of clean drinking water to the vulnerable communities should be given top priority through available resources, while, provision of bottled water may also be considered as a last resort.

e. Relief camps should be established to facilitate the migration of humans / livestock.

f. To prevent the outbreak of epidemics, comprehensive emergency health response be planned by relevant stakeholders. Sizeable stock of life-saving drugs & vaccines be ensured.

g. Need based health mobile teams in districts & talukas may be considered by concerned Health Departments.

Conclusion

33. 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: ___ June 2023

Brigadier
For Chairman NDMA
(Mohammad Umar Chattha)
Tel: 051-9030843
Fax: 051-9030729

Distribution List. Attached.

Annexes

A - NDM Act Clause - 9

B - NDMA Relief Assistance

C - International Relief Assistance to Provinces

D - Flood Hazards Map - Pakistan

E - GLOF Hazard Map - Pakistan

F - Landslide Hazard Map - Pakistan

G - Avalanche Hazard Map - Pakistan

H - Drought Hazard Map - Pakistan

I - Flood Routing Map

J - SITREP Format for Provinces/ Districts

K - Country Wide Location of NDMA Warehouses

L - Important Contact Numbers

M - Drought Mitigation Plan Matrix

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

NDMA RELIEF ASSISTANCE (UNTIL 10TH APRIL 2023)

Province	Tent	Tarpaulin	Mosquito Nets	Blanket	Hygiene Kits	Kitchen Set	Food Packs	First Aid Kit	Generator	Chem. Spray Machine	Jerry Can	Sleeping Bag	De-watering Pumps	Life Saving Jacket	Water (Ton)	Boat
BLN	74886	21400	503298	77170	3000	3200	37000	5000	85	140	8000	1000	104	200	145	-
KP	8173	7470	16750	51631	1150	1200	16000	500	26	0	1000	7805	6	0	21.6	-
PB	1750	1500	1500	1000	1000	500	3400	500	0	0	1000	500	20	50	15	-
SINDH	197125	46215	1522556	84965	2150	4444	67800	11660	15	65	2000	-	159	100	197	55
AJ&K	450	300	-	750	-	200	-	500	-	-	-	-	-	-	-	-
GB	1550	700	-	19029	-	400	2000	700	-	-	-	-	-	-	-	-
TOTAL	**283934**	**77585**	**2044104**	**234545**	**7300**	**9944**	**126200**	**18860**	**126**	**205**	**12000**	**9305**	**289**	**350**	**275**	**55**

Annex C

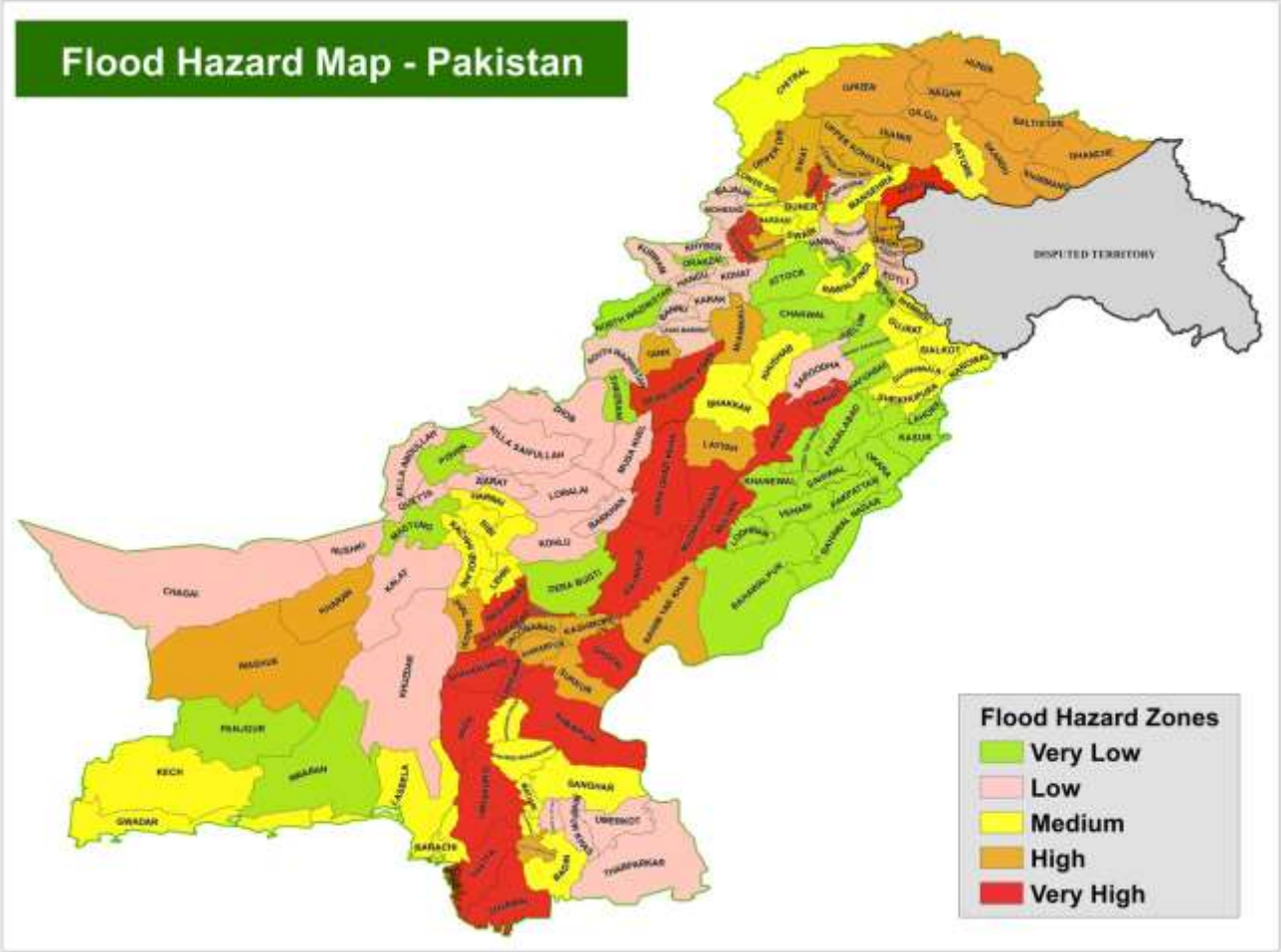
INTERNATIONAL RELIEF ASSISTANCE TO PROVINCES (UNTIL 10TH APRIL 2023)

Province	Tent	Tarpaulin	Blanket		Hygiene Kits	Kitchen Set	Food Packs	Ration	Baby Food	Medicine (Ton)		Water Pumps	Sleeping Mat	Boat	Sleeping Bag
			No	Ton			No	Ton		Ctn	Tons				
BLN	13783	1330	50731	0	10622	5137	165250	79.78	13	27	17.762	0	861	0	4905
KP	1641	0	18344	1	99	0	42689	5	0	0	0	0	0	0	0
PB	910	0	0	1	609	0	4613	20	0	0	0	0	0	0	0
SINDH	16010	875	54450	6	15727	2837	248410	134.6	1017	12704	22.21	93	840	58	6060
AJ&K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
GB	300	0	10	0	33	0	7578	0	-	0	0	0	0	0	0
TOTAL	**32644**	**2205**	**123535**	**8**	**27090**	**7974**	**468540**	**239.4**	**1030**	**12731**	**39.972**	**93**	**1701**	**58**	**10965**

Food (tons) – **2585** & Water 500 Ton in addition to food packs mentioned above

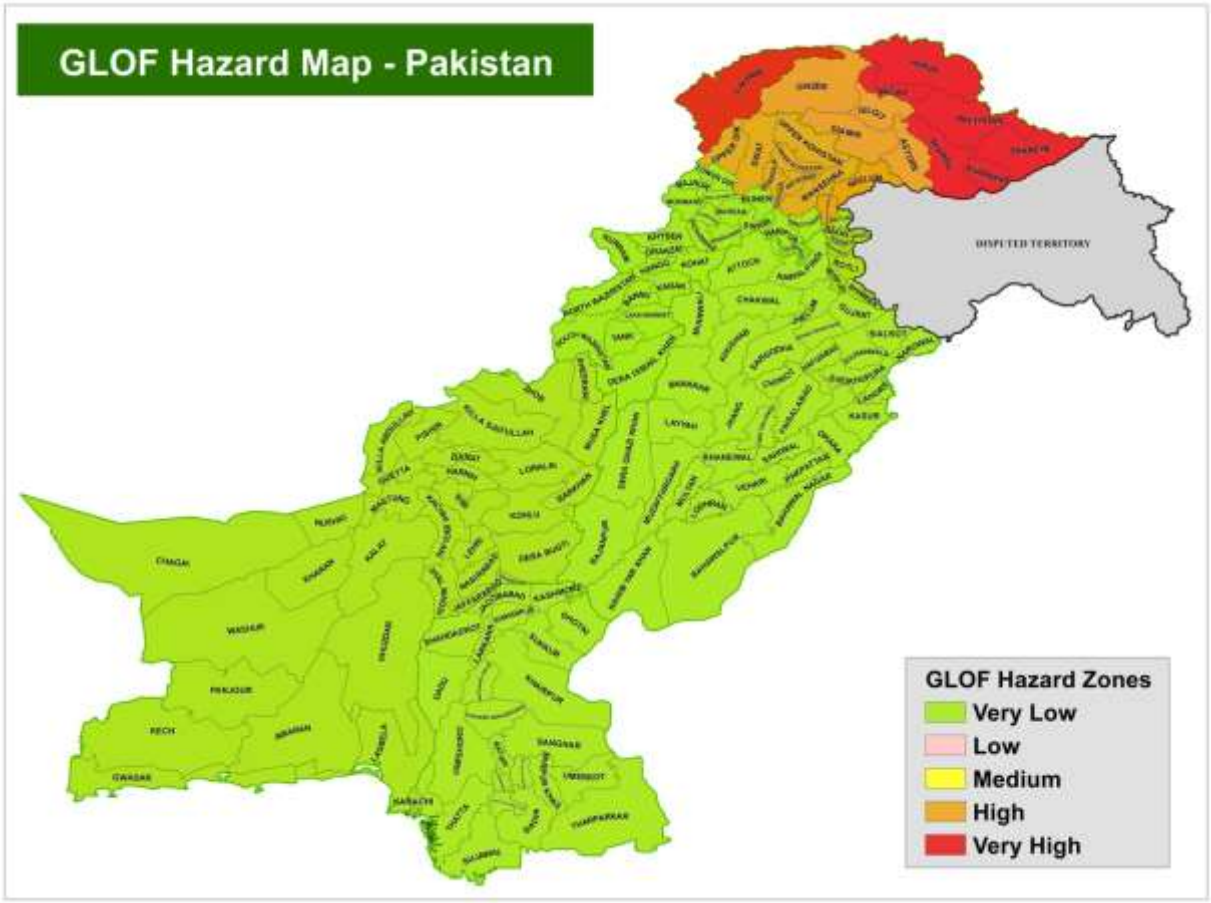
Annex D

FLOOD HAZARD MAP



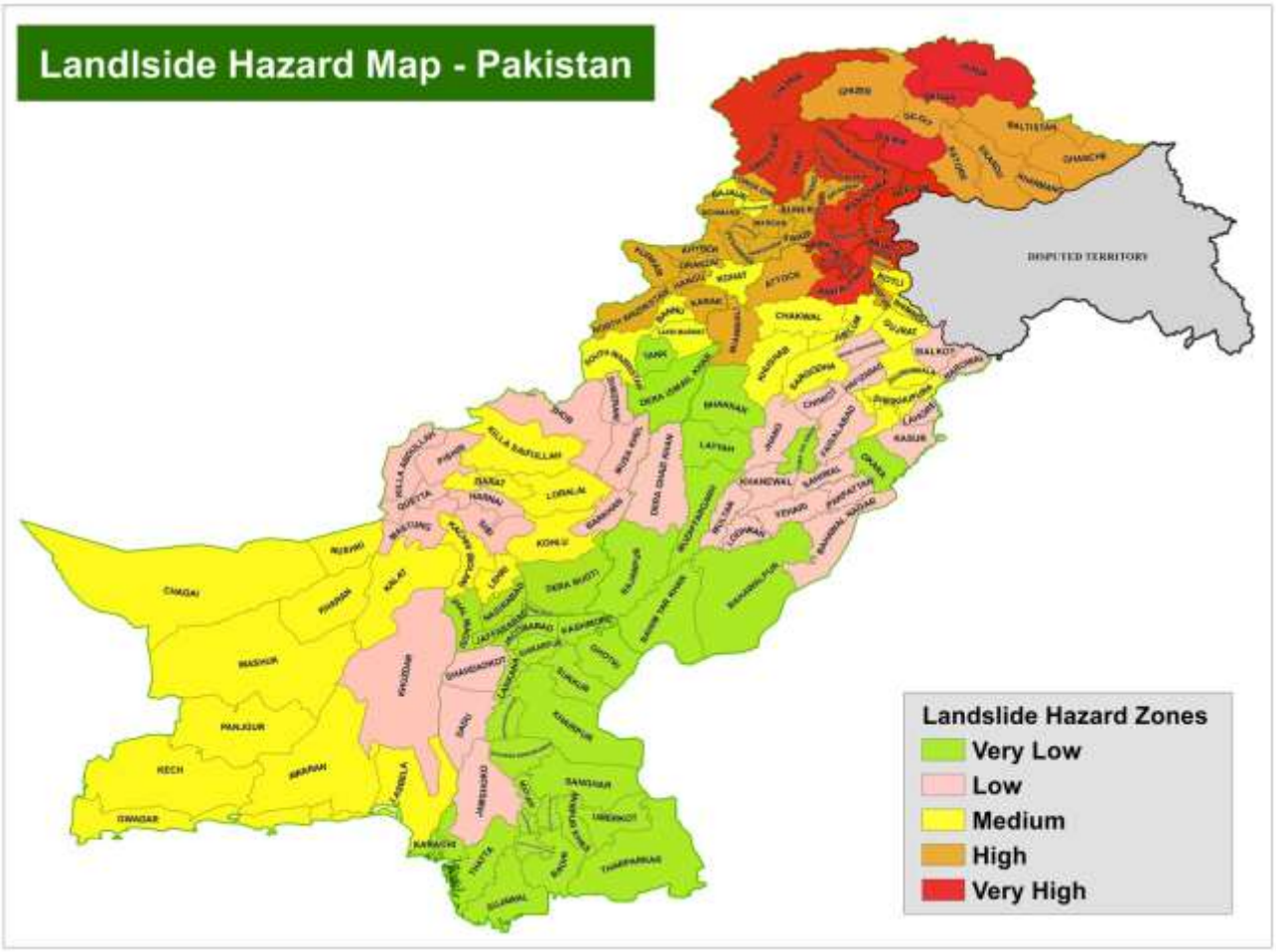
Annex E

GLOF HAZARD MAP



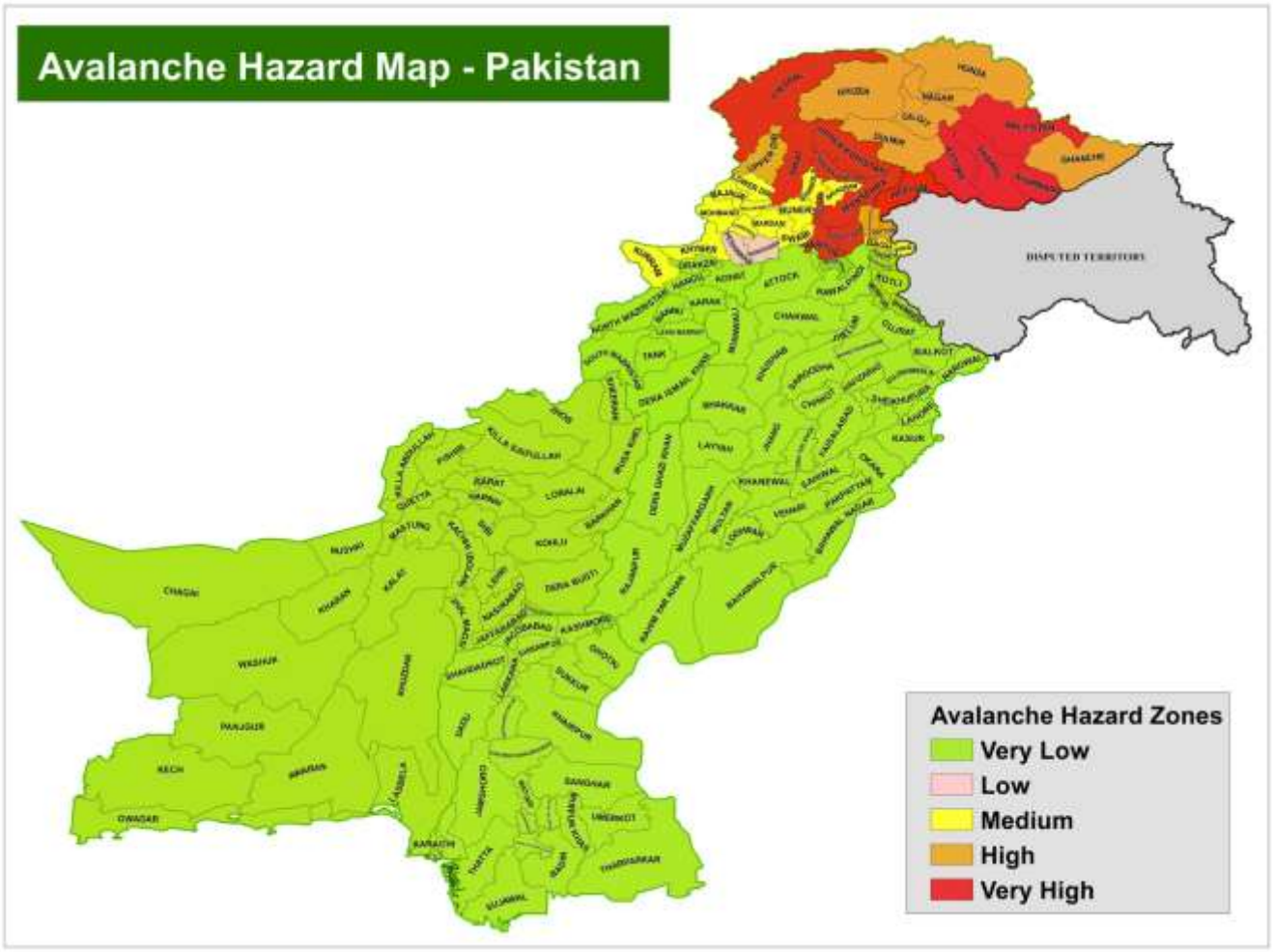
Annex F

LANDSLIDE HAZARD MAP



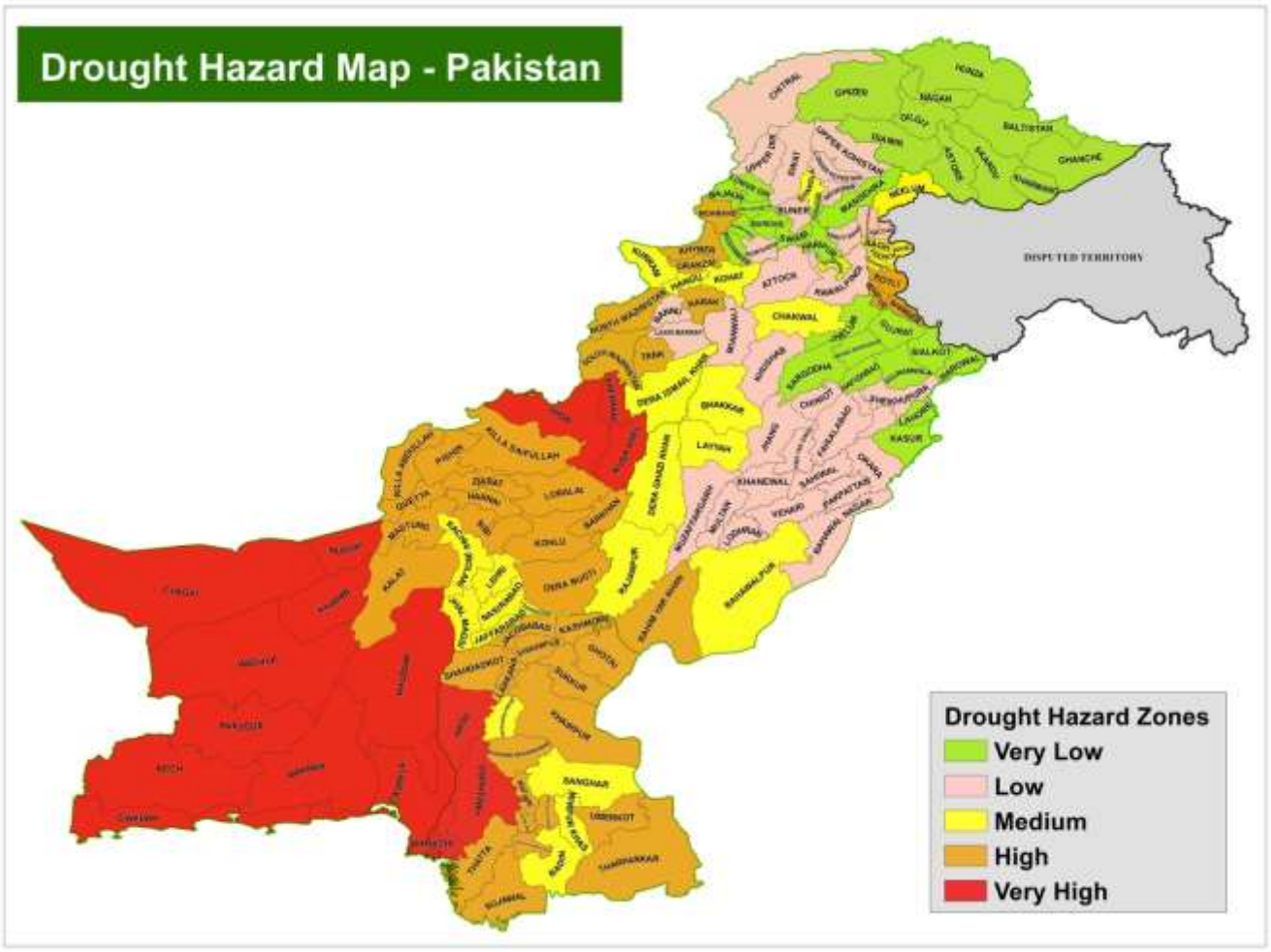
Annex G

AVALANCHE HAZARD MAP



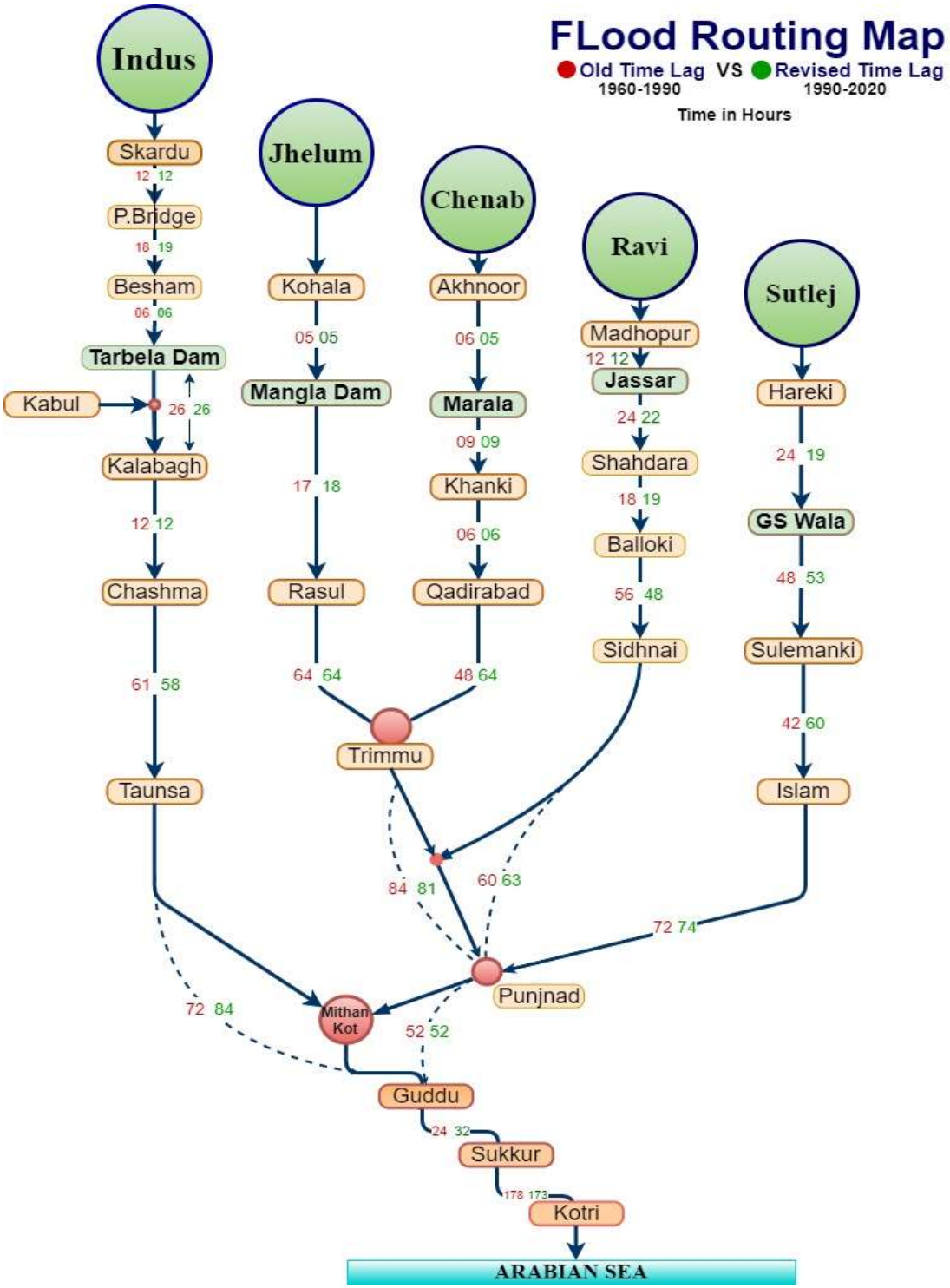
Annex H

DROUGHT HAZARD MAP



Annex I

FLOOD ROUTING MAP



Annex J

SITUATION REPORT FORMAT FOR PROVINCES
MONSOON 2023 DAILY SITUATION REPORT NO - 001
(PERIOD COVERED: 1300 HRS __ June 2023 - 1300 HRS __ June 2023)

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

Ser	District	Incident / Area Affected / Damage
a.		

2. **Extent of Damages**

a. **Damages (During Significant Events - Monsoon 2023)**

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**.

Annex K

COUNTRY WIDE LOCATION OF NDMA WAREHOUSES

1. **Strategic Humanitarian Response Facilities (HRFs)**

Serial	Location	No of Sheds		
		PDMA	NDMA	Total
a.	Jallozai / KP	3	1	4
b.	Lahore / Punjab	3	1	4
c.	Muzaffargarh / Punjab	2	1	3
d.	Jamshoro / Sindh	2	1	3
e.	Sukkur / Sindh	2	1	3
f.	Quetta / Balochistan	3	1	4

2. **NDMA Warehouses**. In addition to strategic HRFs, NDMA has following warehouses in the country: -

a. **Punjab**

(1) Rawalpindi (Central Stock to support Punjab / KP / FATA / AJ&K/ GB / ICT).

(2) Lahore.

b. **Sindh**

(1) Karachi.

(2) Sukkur (Central stock to support Sindh / Balochistan).

c. **Balochistan**. Quetta.

d. **AJ&K**. Muzaffarabad.

e. **GB**

(1) Gilgit.

(2) Skardu.

3. **Flospans**. 53 x Flospans have been established at different location across the Country.

Annex L

IMPORTANT TELEPHONE NUMBERS

Ser	Department	Contact Number
1.	National Emergency Operation Centre (NDMA) Islamabad	UAN-051-111-157-157 051-9205037
2.	Provincial Emergency Operation Centre (PEOC) Punjab	042-99204408 042-99203163
3.	Provincial Emergency Operation Centre (PEOC) Sindh	021-99332005 021-99332003
4.	Provincial Emergency Operation Centre (PEOC) Balochistan	081-9241133 081-9241118
5.	Provincial Emergency Operation Centre (PEOC) KPK	091-9213867 091-9213845 091-9213855
6.	State Emergency Operation Centre (SDMA) SDMA AJ&K	05822-921536 05822-921643 05822-921101
7.	GBDMA Emergency Operation Centre, Gilgit	05811-922030 920874-75
8.	Pakistan Meteorological Department (PMD)	051-9250367 051-9250368 051-9250364
9.	Flood Forecasting Division, Lahore	042-99200208
10.	Army Flood Control Centre, Engineers Directorate	051-5202059 051-5202060 203525 (DEFCOM) 8000-30855 (PASCOM)
11.	DG NHEPRN	051-9255708-9
12.	Federal Flood Commission	051-9244604 051-9244616
13.	IRSA, Islamabad	051-9244600 051-9244599
14.	SUPARCO Islamabad	051-9075265
15.	Nullah Lai Control Room	051-9250566
16.	Rescue 1122 Punjab	042-37423372
17.	Rescue 1122 Rawalpindi	051-9291185
18.	Rescue 1122 Khyber Pakhtunkhwa	091-9222483-4
19.	Rescue 1122 Gilgit Baltistan	05811-922137
20.	Rescue 1122 Azad Jammu & Kashmir (SDMA)	0333-3331122
21.	Geological Survey of Pakistan, Islamabad	051-9269579 051-9255141
22.	COMKAR Karachi	021-48506113 021-48501705
23.	Pakistan Maritime Security Agency, Karachi	021-99214624 021-99214625
24.	Marala Headworks Observatory	052-35021027
25.	PCIW (Pakistan Commission for Indus Water) Lahore	042-99212783-86

Ser	Department	Contact Number
26.	GM, Pakistan Railway Lahore	042-99201700
27.	Punjab Irrigation Department	042-99212117-8
28.	Balochistan Irrigation Department	081-9201074
29.	Sindh Irrigation Department	021-99222949 021-99222950
30.	Azad Jammu & Kashmir Irrigation Department	05822-921596 05822-921157
31.	KPK Irrigation Department	091-9210845 091-9212116
32.	Civil Defence Punjab	042-99212109 042-99212111
33.	Civil Defence Sindh	021-99243765
34.	Civil Defence KPK	091-9212176 091-2263158-59
35.	Civil Defence Balochistan	081-9201853 081-9201118
36.	Terbela Dam	0938-281185
37.	Mangla Dam	0544-639353
38.	Rawal Dam	051-9255756 051-9255757-8-9

Annex M

DROUGHT MITIGATION PLAN MATRIX

Indicator	Policy Inputs	Developmental / Mitigation / Emergency Response Measures	
		Long to Medium Term	**Short Term**

Water Security	• Enhance water storage infrastructure capacity
	• Promote
	  • Water conservation
	  • Integrate water resource management
	  • Remote sensing driven capacity
	  • Sustainable use of water
	  • Community participation & public awareness on water conservation
	  • Ecological approaches
	• Reinforce legislative framework
	• Optimize Wetlands capacity
	• Mainstreaming Climate Change
		Supply Side Development Interventions:
		• National water storage capacity enhanced
		• Thar Canal
		• Flood water storage along Sutlej
		• Extension of Rainee Canal
		• Transferring piped water in Thar & Kohistan
		• RO Plants installation
		• Fresh water extraction
		• Tube wells
		• Extension of water distribution network
		
		Water Demand Management:
		• Water conservation awareness
		• Participatory approaches
		• Legislative & administrative measures
		• Community based sustainable solutions
		
		Ecological Solutions:
		• Revive natural water basins
		• Promote rain water harvesting
		• Water storage promotion
		• Small and check dams
		• Reverse osmosis plants
		• Water spreading
		• Recycling of used water
		• Participatory approach in public interventions; Create **Water Management Boards** regionally and in provinces
			• Water contingency planning
			• Water tinkering / bottled distribution
			• Water purification
			• Cloud seeding (artificial rains)
			• Hygiene & sanitation

Food & Agriculture	• Introduce drought and heat resistant crops • Horizontal expansion of cultivated lands	**Arid Zone Agricultural Practices:** • Promote sailaba and khushkaba practices • Introduce drip irrigation	**Food Security Short Term Response:** • Deployment of wheat reserves in the vulnerable districts

Indicator	Policy Inputs	Developmental / Mitigation / Emergency Response Measures	
		Long to Medium Term	**Short Term**
	• Corps risks management • Efficient food chain management • Coordinated and inclusive policy implementation • Awareness raising and community capacity building in arid zone • Arid zone agriculture research institutes in Sindh & Balochistan • Water loss reduction • Integrated water basin management	• Cropping calendars adapted to avoid heat losses • Conjunctive use of surface and ground water • Shift to less water demanding crops • Saline water agricultural practices • Soil conservation • Rain water harvesting & storage • Watershed agricultural management • Soil fertilization • Best practices to be widely shared	• Food security vulnerability assessment • Food distributions to the vulnerable population • Efficient & equitable distribution mechanisms • Exit strategy
Health	• Promote health security through improved health service delivery • Reinforce preventive and curative health focus • Mainstreaming reproductive health standards • Infrastructure and human resource development • Health awareness raising	**Developmental:** Gap filling in health infrastructure; **Health Service Delivery & Emergency Response:** Following to be reinforced:- • Preventive health care • Emergency health outreach • Reproductive health care • Community based malnutrition programme • Disease early warning, epidemic control and responses • Health referral system • Human resource deficiencies addressed • Health advocacy and capacity building	
Rangeland & Livestock Management	• Policies aligned with environmental sustainability • Promote collaborative rangeland management • Governance & ownership issues streamlined • Incentive driven community-based management. • Afforestation efforts. • Mitigate desertification. • Renewable energy solutions to check deforestation. • Research institutes.	**Rangeland Management:** Promote: • Vegetative barriers to prevent erosion. • Mapping / stocktaking. • Introduction of exotic grasses, trees varieties. • Water storage and rainwater harvesting. • Sustainable usages. • Revival / reinvigoration. • Heat tolerance promoted. • Desertification measures. • Watershed management.	**Livestock Emergency Management:** • Mapping and monitoring of vulnerable caseload • Emergency response planning, management • Livestock sanctuaries deployed with fodder and water • Fodder banks to be deployed

Indicator	Policy Inputs	Developmental / Mitigation / Emergency Response Measures	
		Long to Medium Term	**Short Term**
	• Sustainable livestock population. • Promote livestock and rangeland research. • Private sector's inclusion in veterinary service.	• Check deforestation through participatory methods. • Artificial fertilization techniques. • Controlled rangeland burning. **Livestock Management**: • Census, audit. • Veterinary cover. • Disease surveillance & response. • Multi nutrient blocks. • Promote de-stocking. • Livestock sanctuaries. • Communities capacity building in livestock management. • Advocacy, awareness generation. • Value addition of livestock products.	• Introduce briquettes / MNBs as emergency fodder
Climate Change Adaptation		• Climate change hazards, risk and vulnerability mapping. • Scenarios development. • Adaptation strategies and actions. • Generate awareness.	
Community Resilience		**CBDRM** approach for reinforcing resilience as: • Structural solutions. • Non-structural solutions. • Ecological solutions. • Climate change adaptation.	