

NDMA'S

**Detailed Roles & Responsibility Matrix for
Implementation of NDMP- III**

2024



1. Priority Interventions and Actions by Major Hazard (Flood, Earthquake, Landslide and Drought):

a. Floods

Strategy	Intervention	Action	Linkage with SFDRR	Execution Agency		
				Main	Support	Action
Flood Risk Reduction	Update the National hazard & risk assessment and its database	National database development of the historical flood disasters and its impact	Priority 4	NDMA	SUPARCO, NDRMF	<p>SUPARCO: Utilize remote sensing and GIS expertise to update the national hazard and risk assessment.</p> <p>NDRMF: Provide financial support for updating the national hazard and risk assessment and developing the national database. Allocate funds for equipment procurement, capacity building, and other necessary activities.</p> <p>NDMA: Prepare inclusive and cross-cutting gender,</p>

						disability, children and old age plans which focus on historical impacts on vulnerable populations.
	Update runoff and inundation analysis model	Development of risk atlases including flood hazard, risk maps with catalogues (National Level)	Priority 2	NDMA,	FFC, SUPARCO, NDRMF, PBS	<p>FFC: Contributes expertise and data related to flood hazard assessment to enhance the accuracy and comprehensiveness of the national risk assessment.</p> <p>SUPARCO: Provides satellite imagery and geospatial data for the development of risk atlases and flood hazard maps, supporting better risk management planning.</p> <p>NDRMF: Supports the funding and implementation of initiatives aimed at updating the national hazard and risk assessment database, facilitating better risk management practices.</p> <p>PBS: Offers statistical expertise and sex</p>

						disaggregated data management support to ensure the accuracy and reliability of the updated hazard and risk assessment database.
		Development of probabilistic flood hazard and risk maps along the Indus River with CC Impact		NDMA	FFC, NDRMF, SUPARCO	<p>FFC: Provides technical expertise and data on flood dynamics specific to the Indus River, ensuring the accuracy of hazard and risk maps.</p> <p>NDRMF: Facilitates financial support for initiatives aimed at developing probabilistic flood hazard and risk maps, enhancing flood risk management.</p> <p>SUPARCO: Utilizes satellite technology and geospatial data to enhance the precision and effectiveness of flood hazard and risk mapping along the Indus River.</p>

		Research studies on selected cities prone to urban flooding		MCs and Development Authorities	SUPARCO, Academia and NDRMF	Academia will collaborate with SUPARCO and NDRMF.
	Update the National hazard & risk assessment and its database Planning for better risk management	Mapping the Nullahs/hill torrents responsible for flash flooding	Priority 4	PIDs	FFC, PDMA, NDMA	FFC: Contributes technical expertise and data on Nullahs/hill torrents to ensure comprehensive mapping for the national hazard and risk assessment database. PDMA: Collaborates with NDMA and other agencies to provide localized data and insights for mapping Nullahs/hill torrents within their respective provinces and impacts on vulnerable populations specifically women, children, elderly and disabled. PIDs: Offer specialized knowledge and data on hydrology and water flow patterns in their respective regions, aiding in the accurate mapping of Nullahs/hill torrents for the national

						hazard and risk assessment database.
		National Drainage Master Plan (Undertake hydrological modeling and food-plain mapping and zoning of the Indus River system using climate change scenarios to estimate various projected flood levels)		FFC	PID	<p>FFC: Oversees the implementation of the National Drainage Master Plan, focusing on undertaking hydrological modeling and floodplain mapping of the Indus River system. It integrates climate change scenarios to estimate various projected flood levels.</p> <p>PID: Collaborates with FFC to provide localized data and insights for hydrological modeling and floodplain mapping within their respective provinces. They contribute to the zoning of the Indus River system and ensure alignment with provincial development plans and policies.</p>

		O&M Plan of the Bunds of Indus River		PID	FFC	<p>PID: Takes charge of the O&M Plan for the bunds of the Indus River within their respective provinces. This includes regular inspections, repairs, and upkeep to ensure the structural integrity and effectiveness of the bunds in flood protection.</p> <p>FFC: Provides technical guidance and support to PID in the development and implementation of the O&M Plan for the bunds of the Indus River. They may also coordinate inter-provincial aspects and ensure adherence to national standards and protocols.</p>
		Development of the Bund Training Manuals		PID	FFC	PID leads the development of Bund Training Manuals and
		Development of planning & design criteria		PID	FFC	planning & design criteria, with support from FFC, ensuring standardized guidelines and procedures for bund

						construction and maintenance along the Indus River.
Update and formulation of Laws and (Technical-) Guidelines and Act	Guidelines of CC Impact involvement to Flood Protection Plan and Design	Priority 4	FFC	MoCC, PMD, PID	FFC prioritizes updating laws and technical guidelines, focusing on integrating climate change considerations into flood protection plans, collaborating with MoCC, PMD, and PID. PID leads the revision of the National River Act in conjunction with FFC to ensure alignment with provincial flood management needs.	
					Revision of National River Act	PID spearheads regional expertise and insights, ensuring local perspectives in revising the National River Act, while FFC provides national-level guidance to align the act with federal flood management strategies.

		Preparation of Tools and System for Projects' Management	Priority 2	FFC	PID	FFC focuses on preparing tools and systems for project management, while PID leads the development of planning and design criteria.
		Development of planning & design criteria		FFC	PID	
	Flood Management Development of Flood Disaster Risk Management Information System and sharing	Establishment of Project Management System	Priority 2	FFC, PID	MoWR	FFC and PID working on the development of a Flood Disaster Risk Management Information System and sharing, alongside the establishment of a Project Management System, with support from MoWR
		Update of hydro-metrological Information sharing mechanism and system		FFC	PID, WAPDA, PDMA's	FFC spearheads the development of a Flood Disaster Risk Management Information System and sharing, as well as the establishment of a Project Management System, with collaboration from PID, WAPDA, and PDMA's. Additionally, PID leads the update of the hydro-metrological

						information sharing mechanism and system.
		Provision of technical experts/staff for flood risk analysis on Hill torrent and regional rivers Capacity enhancement to understand flood disaster mechanism and hydrological analysis		PID	FFC	PID and FFC collaborate closely on flood management efforts, with PID supplying technical experts and staff for flood risk analysis on hill torrents and regional rivers, while FFC takes the lead in enhancing capacity to understand flood disaster mechanisms and conduct hydrological analysis. This partnership ensures a comprehensive approach to flood risk assessment and management, combining technical expertise with capacity-building initiatives.
		Update of hydro-metrological Information sharing mechanism and system		PID	FFC	PID and FFC jointly undertake the update of hydro-metrological information sharing mechanisms and systems, ensuring the

						timely and accurate dissemination of critical data for effective flood management and response efforts.
Institutional Improvement	Provincial-level institutional strengthening for robust flood disaster risk management	Provincial Level Flood Hazard & Risk Map Strengthen the capacities to address on the Flood DRM system	Priority 2	PID	PDMA NDMA	PID leads institutional strengthening efforts to enhance resilience against floods, while PDMA contributes to the development of provincial-level flood hazard and risk maps for informed decision-making. NDMA supports capacity-building endeavors aimed at strengthening the flood disaster risk management system, ensuring efficient coordination and response mechanisms within the provinces. NDMA ensures coordination and management of humanitarian stakeholders to ensure that flood disaster risk management is

						inclusive and targets gender specific risks.
	Development of Flood Disaster Risk Management Information System and sharing		Priority 2	PDMA	NDMA	<p>PDMA and NDMA jointly lead the development of a Flood Disaster Risk Management Information System and sharing mechanism. This involves creating an integrated platform to collect, analyze, and disseminate critical flood-related data for effective decision-making and coordinated response efforts at both provincial and national levels.</p> <p>Inclusion of sex disaggregated data in the Disaster Risk Management Information System for sharing with humanitarian stakeholders.</p>

b. Landslides

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		
				Main	Support Organizations	Action
Comprehensive Landslide Management: Assessment, Awareness, and Stabilization Strategies	Conducting landslide risk assessment	Conduct a landslide risk assessment for Northern areas of Pakistan at the macro scale	Priority 1	NDMA	PDMA, Forest Department, Land Use Planning Department	<p>NDMA: Oversee and coordinate the overall landslide risk assessment process, ensuring collaboration and communication among stakeholders for information of vulnerable populations specifically women, children, elderly and disabled.</p> <p>PDMA: Provide local expertise and data specifically sex disaggregated data to supplement the risk assessment, especially regarding specific regional conditions and vulnerabilities.</p> <p>Forest Department: Offer insights into forest cover and its impact on landslide susceptibility, as well as potential mitigation measures involving forestry practices.</p> <p>Land Use Planning Department: Contribute expertise in land use</p>
		Identify highly vulnerable areas for mitigating the landslides and slope instabilities				
		Develop an Atlas of landslide hazard-prone areas and develop the profile				

						<p>zoning and planning to identify areas where development activities could exacerbate landslide risks or where mitigation measures could be integrated into future land use plans.</p> <p>Collectively, the stakeholders work together to assess and mitigate landslide risks in the Northern areas of Pakistan, aiming to enhance resilience and reduce the impact of landslides on communities and infrastructure.</p>
	Community Awareness	Conduct regular awareness campaigns to educate the public about landslide risks and safety measures.	Priority 1	DDMAs	INGOs., UNO, PDMA and NDMA	<p>DDMAs: Coordinate and implement community awareness campaigns at the district level, ensuring the dissemination of accurate information about landslide risks and safety measures to the vulnerable populations to ensure that their needs are catered for.</p> <p>INGOs and UNO: Provide technical expertise, resources, and support to enhance the effectiveness of community awareness campaigns and training programs.</p> <p>Organize seminars and workshops on disaster related to</p>
		Provide training on recognizing early signs of instability and appropriate response actions.				
		Promote social forestation to plant climate-				

		<p>smart vegetation to stabilize slopes and reduce soil erosion in their field and near residential areas.</p>			<p>influence the government and donors to allocate more resources to relief and recovery with focus on gender equity and social inclusion.</p> <p>Develop IEC material on disaster related issues for preventive measures in local languages and multiple mediums to ensure adequate female outreach and access to information.</p> <p>Engage female community-based organizations to reach the most marginalized in the communities.</p> <p>PDMA: Oversee the implementation of community training programs, ensuring that residents are equipped with the knowledge to recognize early signs of instability and respond appropriately and ensure the inclusion of women, adolescent girls and persons with disabilities.</p> <p>NDMA: Provides Strategic guidance and support to ensure the coordination and effectiveness of community awareness initiatives nationwide, fostering a culture of disaster preparedness and resilience within the most vulnerable</p>
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						populations specifically women, children, elderly and disabled.
Strengthening land stabilization through structural measures	Priority 2	PDMA's	Forest Department, Irrigation Department, Land use Planning Department	Construct retaining walls or terraces to break up steep slopes and minimize the risk of mass movement.	PDMA's Collaboration involves the Forest Department, Irrigation Department, and Land Use Planning Department.	
				Construct gravity retaining walls to support soil and reduce the risk of slope failure.	Construct retaining walls or terraces to break up steep slopes and minimize the risk of mass movement.	
				Use gabion walls (wire mesh baskets filled with rocks) to stabilize slopes and prevent erosion.	Construct gravity retaining walls to support soil and reduce the risk of slope failure. Utilize gabion walls (wire mesh baskets filled with rocks) to stabilize slopes and prevent erosion.	
				Use bioengineering techniques such as erosion control mats and blankets for slope stabilization.	Implement bioengineering techniques like erosion control mats and blankets to stabilize slopes effectively, mitigating erosion risks and reducing landslide occurrences.	
				Retrofit structures to improve their		

		<p>resistance to seismic activity, reducing the likelihood of landslide-triggering earthquakes.</p>				<p>Retrofit existing structures to enhance their seismic resistance, thus lowering the likelihood of landslide-triggering earthquakes and increasing overall structural stability. Ensure adequate WASH facilities in the retrofitted constructions.</p>
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c. Earthquake

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		
				Main	Support organizations	Actions
Enhancing Earthquake Monitoring and Assessment	Establishment of a committee for the evaluation of earthquake faults and the practice of fault evaluation.	Announcement and selection of the committee members	Priority 4	NDMA	Academic, PEC	
		Hold regular meetings for institutionalization		NDMA	Academic, PEC	
		Assessing the active and non-active faults and their mapping		NDMA	Academic, PEC	
	Maintaining record and publication of epicenter rapture (real-time) and estimated intensity data	Collect historical data of earthquake disasters, and update it with epicenter rupture / estimated intensity data	Priority 2	PMD	GSP, NDMA, PDMA, DDMA	NDMA, PDMA and DDMA: Collect historical data on losses especially sex disaggregated of earthquake disasters i.e. total number of women, children, girls, elderly (male/female aged 55 yrs and above), persons with disabilities affected and other marginalized communities.
		Present and approval from the committee		PMD	GSP, NDMA, PDMA, DDMA	
		Information sharing about the seismic data to relevant government authorities (e.g., to EOCs)		PMD	GSP, NDMA, PDMA, DDMA	NDMA, PDMA and DDMA: Sharing the disaggregated data with Humanitarian stakeholders to Gender inclusive EQ response and Preparedness.
		Publication and dissemination of data and reports		PMD	GSP, NDMA, PDMA, DDMA	NDMA, PDMA and DDMA: Prepare and publish DRR plans according to the number of vulnerable communities residing on areas on and around active fault lines. Disseminate data and reports amongst stakeholders.

	<p>Scenario earthquake-based seismic risk assessment of selected earthquake-prone cities deriving the geotechnical information including urban-level details, liquefaction, etc.</p> <p>Updating hazard assessment by probabilistic seismic risk assessment using soil amplification factors.</p>	Suggested for long-term planning
<p>Upgrading the Damage and Loss Assessments Procedures</p>	<p>Develop guidelines for an earthquake damage assessment (scenario-based earthquake micro zoning assessment)</p>	
<p>Capacity Enhancement of Human Resources for Earthquake Safer Construction</p>	<p>Training of the concerned technical officers of the government sector</p>	

d. Drought

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		
				Main	Support Organizations	Action
Comprehensive Landslide Management: Assessment, Awareness, Stabilization Strategies and	Numerical modeling on water allocation and case study with hydrological perspective	Aggregation of data (water right, traditional water extraction without registrations. standard discharge for wet and dry season etc.)	Priority 1	IRSA	PCIW, MoWR	Collaboration involves PCIW and MoWR
		Analysis of flow duration curve for understanding water regime (High-, Normal-, Low- and Drought- Water) and its probability		IRSA	PCIW, MoWR	Conducting numerical modeling on water allocation and case studies with a hydrological perspective.
		Review on water consumption amount by crops and irrigation efficiency		IRSA	PCIW, MoWR	Aggregating data on water rights, traditional water extraction without registrations, and standard discharge for wet and dry seasons.
		Establishment of the water allocation model		IRSA	PCIW, MoWR	
	Revision and update of current IRSA Act for smoothing	Case study on water allocation on dry seasons by using the model	Priority 2	IRSA	PCIW, MoWR	Analyzing flow duration curves to understand

	information consensus in terms of hydrological mechanism in the Indus River	Analysis of distribution during drought		IRSA	PCIW, MoWR	water regime variations (High-, Normal-, Low-, and Drought-Water) and their probabilities.
		Revision and update of IRSA Act		IRSA	PCIW, MoWR	
Promotion of Water conservation and harvesting	Planning on improvement and construction of structural measures for water storage	Improvement and construction of reservoirs and ponds	Priority 2	PID	OCEA	PID collaborates with OCEA for planning and implementing structural measures for water storage, including the improvement and construction of reservoirs and ponds. PID and OCEA work together to promote water-saving agriculture and update cropping pattern information, facilitating efficient water use
	Promotion of water-saving agriculture and update of cropping pattern information	Study and planning of appropriate water-saving agriculture	Priority 2	PID	OCEA	
	Implementation of constructions and improvement of water storage, conveyance and field distribution structures	Improvement and construction of ponds and reservoirs; improvement of irrigation efficiency such as lying channels, dripping pipes and sprinkler; and water harvesting measurements with	Priority 3	PID	OCEA	

		climate viewpoints	change				efficiency through measures such as lying channels, dripping pipes, and sprinklers, and implementing water and rain harvesting strategies with considerations for climate change.
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2. Priority Interventions and Actions for Miscellaneous Hazards

a. Smog

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		
				Main	Support Organizations	Action
Comprehensive smog management through effective assessment and planning	Urban Smog Risk Assessment and Management for Lahore and Karachi	Conduct smog risk assessment of Karachi and Lahore cities	Priority 1	PDMAs	Urban unit, LDA and KDA	PDMAs (Provincial Disaster Management Authorities) leading the initiative. Collaboration involves the Urban Unit, Lahore Development Authority (LDA), and Karachi Development Authority (KDA).
		Mapping of vulnerable areas and developing a catalog				
		Development smog risk assessment report and its dissemination to concerned organizations				
		Conduct awareness-raising sessions at the city level				
	Develop Provincial level smog contingency plans	Develop a provincial-level smog contingency plan for Punjab Province	Priority 2	PDMAs	Urban unit, LDA, District Administration	Conducting smog risk assessments for Karachi and Lahore cities, mapping vulnerable areas, developing a catalog, and disseminating a smog risk assessment
		Conduct proper consultations with key stakeholders				

		Develop a draft plan for review				report to concerned organizations.
		Organize a one-day validation workshop to refine the plan				
		Publication and wide dissemination				
	Continue awareness-raising sessions and campaigns	Promote the use of public transportation	Priority 3	EPAs	INGOs., UNO, DDMA, PDMA and NDMA	EPAs: Lead coordination and implementation of smog management initiatives.
		Compliance with strict emission standards				Organize awareness campaigns.
		Implement effective waste management practices to reduce open burning of waste, a significant contributor to air pollution				Enforce emission standards.
		Enforce and improve traffic management strategies to reduce traffic-related emissions				Collaborate for effective waste management.
		Encourage public transportation to reduce the number of individual vehicles on the road, thereby decreasing emissions.				INGOs and UNO: Provide technical expertise and support.
						Formulate and disseminate awareness campaigns which are gender inclusive and focus on specific needs and concerns of vulnerable populations. Support public transportation improvement projects

						<p>which are gender inclusive. DDMAs, PDMAs, and NDMA: Collaborate in smog management.</p> <p>Coordinate awareness efforts to ensure maximum outreach to vulnerable populations. Enforce traffic policies. Support waste management practices.</p>
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b. Heatwave

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		
				Main	Support Organizations	Action
Integrated Heatwave Preparedness and Response System	Comprehensive heatwave management framework: coordination, contingency, and alert	Develop a coordination committee among the PMD, NDMA, DDMA, health department, and development authorities to keep vigilance of heatwaves during the summer season.	Priority 4	NDMA	PDMAs, PMD	NDMA Coordinates with PMD, DDMA, health department, and development authorities. Provides guidance for effective coordination and contingency planning.
		Develop contingency plans for cities exposed to heatwave				PMD: Provides meteorological expertise and issues heatwave alerts.
						PDMAs: Support NDMA in coordination and implementation

	<p>Predict and share forecasts, advisories, and alerts with relevant government and non-government stakeholders</p>	<p>Issue heat alerts based on the PMD advisory with the guidance of recommended thresholds and issue daily weather outlook and its dissemination to wider audiences.</p>	<p>Priority 3</p>	<p>PMD</p>	<p>Electronic, PEMRA, Press clubs, PDMA's, DDMA's, development authorities</p>	<p>NDMA: Leads coordination committee establishment for heatwave preparedness.</p> <p>Coordinates with PMD, DDMA's, health department, and development authorities. Provides guidance for effective coordination and contingency planning.</p> <p>PMD: Provides meteorological expertise and issues heatwave alerts.</p> <p>Monitors weather patterns. Collaborates on heatwave preparedness strategies.</p> <p>PDMA's: Support NDMA in coordination and implementation.</p>
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						<p>Participate in coordination committee meetings. Assist in disseminating alerts and implementing response measures.</p> <p>Collaborates on response plans and interventions. Offers training on heatwave-related health risks and ensuring female participation both as trainer and trainees.</p>
		In consultation with the district administration, issue alerts when heat-related cases are recorded.				<p>Contribute urban planning expertise. Identify and implement heatwave mitigation measures.</p>
		Organize training for employees, and outdoor laborers/workers on the impacts of heat and how to protect themselves.				<p>Incorporate resilience into urban development plans</p>

	<p>Initiate Awareness Campaigns</p>	<p>Develop Information, Education, and Communication (IEC) material and its printing for wide dissemination.</p>	<p>Priority 4</p>	<p>PDMA's</p>	<p>DDMA, INGOs, UNOs, and electronic and print media institutions</p>	<p>PDMA leads awareness campaigns.</p> <p>Develop IEC material explicitly for women, girls, children, elderly, disabled, and other populations vulnerable to the heatwave like laborers for dissemination.</p> <p>Collaborate with DDMA, INGOs, UNOs, electronic, and print media.</p> <p>Aim to raise awareness and promote disaster preparedness ensuring adequate female outreach and access to information.</p> <p>Display emergency numbers and nearby hospital details in offices, schools, universities, and factories for accessibility by the</p>
		<p>Display all emergency numbers and nearby hospital details in offices/schools/universities and factories.</p>				

						<p>vulnerable communities. Notify post heat-related illness prevention tips.</p>
		<p>Notify post heat-related illness prevention tips and how to stay cool in locations in and around hospitals and first response centers.</p>				<p>Issue heatwave warnings via SMS, WhatsApp, local TV, and radio channels.</p>
		<p>Hold awareness workshops at the school and community levels.</p>				<p>Maintain adequate stock of emergency medicines for heatwave-related health problems</p>
		<p>Expand access to shaded areas for outdoor workers, slum communities, and other vulnerable populations.</p>				<p>Establish heat response centers in urban areas, particularly congested areas.</p>
		<p>Issue warnings using SMS the WhatsApp source, broadcasting it on local TV and radio channels for local citizens about heatwave awareness and ways to remain protected.</p>				
	<p>Maintain an adequate stock of emergency medicines for heat wave-related health problems</p>	<p>Establish heat response centers in urban areas, especially in congested areas.</p>	<p>Priority 4</p>	<p>Health department</p>	<p>PDMA, rescue 1122, and NDMA</p>	<p>The health department will collaborate with PDMA, Rescue 1122, and NDMA for effective implementation.</p>
		<p>Keep ready an adequate supply of ice packs and</p>				

		<p>fluids required for heatstroke patients.</p> <p>Stockpiling of medicines in bulk for ready use.</p> <p>Open wedding halls during days and mosques so that people can sit under the shade.</p> <p>Equip certain ambulances that can be used at various localities for early-cooling treatment.</p> <p>Create 'displays' on ambulances during local events to enhance public awareness.</p>				
	<p>Set up an Information Center to share information amongst all hospitals, health centers, and health professionals.</p>	<p>Produce weekly reports of the public health impact for PDMA, DDMA Emergency Response Coordinator during a heat alert.</p> <p>Ensure that specific information on all precautions related to heatwaves is available to the public and in all health facilities.</p>	<p>Priority 4</p>	<p>Information department</p>	<p>PDMA's, Health department</p>	<p>Establish an Information Center to share information among hospitals, health centers, and professionals.</p> <p>Ensure availability of specific heat precaution information in all health facilities and to the public.</p>

						Ensure availability of gender inclusive information and supplies for the most vulnerable populations to the heatwave.
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c. GLOF

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		
				Main	Support Organizations	Action
Glacial Outburst (GLOF) Mitigation and Preparedness	Lake Flood Risk and Establish a robust Early Warning System for monitoring GLOF	Establish an early warning system that integrates real-time monitoring of glacial lakes and weather conditions.	Priority 4	PDMAs	DDMAs, PMD, NDMA	Establish a robust Early Warning System for monitoring GLOF along with AI tools & techniques.
		Implement automatic sensors and monitoring devices to detect changes in lake volume, temperature, and other relevant parameters.				Early Warning System should also include weather sensors
						Implement automatic sensors and monitoring devices to detect changes in lake volume, temperature, and other parameters.

		Ensure timely communication of alerts to vulnerable communities through various communication channels.					
	Risk Assessment and Mapping	Conduct comprehensive risk assessments to identify vulnerable areas prone to GLOFs.		PDMA's, NDMA	INGOs, DDMA's	Conduct comprehensive risk assessments to identify vulnerable areas and populations i.e. women, children, elderly and disabled; prone to GLOFs. PDMA and NDMA collaborate with INGOs and DDMA's for implementation.	
		Develop detailed maps of glacial lakes, potential flood pathways, and at-risk communities.					
		Use advanced remote sensing technologies to monitor glacier dynamics and lake expansion.					
	Community Awareness and Preparedness	Conduct regular awareness campaigns to educate local communities about the risks of GLOFs and the necessary evacuation procedures.	Priority 2	DDMA's, NDMA	INGOs, PDMA's	Develop detailed maps of glacial lakes, potential flood pathways, and at-risk communities. Utilize advanced remote sensing technologies to monitor glacier dynamics and lake expansion.	
		Conduct regular drills and training sessions to enhance community preparedness and response capabilities.					
		Enhance the capacity of local authorities, emergency responders,					

		and relevant stakeholders to effectively respond to GLOF events.				INGOs should emphasized upon developing adaptation and mitigation plans for the vulnerable communities, especially for women, adolescent girls, children, elderly and persons with disabilities.
		Provide training on search and rescue operations, medical assistance, and evacuation procedures.				

d. Snow Storm

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		
				Main	Support Organizations	Action
Snowstorm Preparedness: Strengthening Early Warning Systems and Emergency Shelter Planning	Strengthening the Early Warning Systems with Public Awareness and Education	Establish and maintain an advanced early warning system for snowstorms.	Priority 2	DDMAs, PDMAAs	NDMA	DDMAs and PDMAAs collaborate with NDMA for implementation.
		Develop close liaison with the PMD, for getting updates on the prediction and monitoring of the snowstorm patterns.				DDMAs and PDMAAs: Oversee the establishment and maintenance of the advanced early warning system, ensuring that it incorporates state-of-the-art technology and is effectively integrated
		Disseminate timely alerts through various communication				

		<p>channels to inform the public and authorities.</p>				<p>with existing disaster management mechanisms.</p>
		<p>Conduct regular public awareness campaigns about the risks and safety measures during snowstorms.</p>				<p>NDMA: Implement the early warning system at the district level, including installing necessary equipment, monitoring weather conditions, and disseminating timely warnings to local most vulnerable populations.</p>
		<p>Provide guidelines on preparing emergency kits, winterizing homes, and safe travel practices in snowy conditions.</p>				<p>PDMA: Coordinate with DDMA to ensure consistency and effectiveness of early warning efforts across provinces, providing technical support and resources as needed.</p> <p>Collaboratively, the stakeholders work to strengthen early warning systems for snowstorms, aiming to reduce the risk of casualties and damage by alerting and educating the public in advance of hazardous weather events.</p>

	Emergency Shelter Planning	Prepare snowstorm/winter contingency plans at the district levels to prepare for swift emergency response.	Priority 1	DDMAs	PDMAs, INGOs, UNO	<p>DDMAs lead this initiative, collaborating with PDMAs, INGOs, and UNO.</p> <p>The aim is to ensure efficient coordination and preparedness for emergency shelter and response during snowstorms and winter conditions.</p> <p>Ensure that the emergency shelters are gender inclusive and availability of gender inclusive WASH facilities.</p>
Identify and designate emergency shelters in vulnerable areas.						
Equip shelter places with proper heating, blankets, food, and medical supplies.						
The local authorities should prepare efficient evacuation plans and transportation during snow emergencies.						
Winter Resilience: Strengthening Infrastructure and Enhancing Emergency Preparedness	Resilient Infrastructure	Implement measures to strengthen critical infrastructure against snow-related damage, such as power lines and transportation networks.	Priority 4	DDMAs	PDMAs, INGOs., UNO	<p>Priority 4 focuses on implementing measures to strengthen critical infrastructure against snow-related damage.</p> <p>DDMAs lead the initiative, collaborating with PDMAs, INGOs, and UNO</p>
		Regularly inspect and maintain infrastructure to prevent failures during heavy snowfall.				

		Plan for alternate rescue operations in case the roads are blocked				
		Ensure the availability of snow removal equipment and road-clearing machinery.				The goal is to enhance the resilience of infrastructure, including power lines and transportation networks, to withstand the impacts of winter conditions and ensure continuity of essential services.
	Emergency Preparedness	Train healthcare professionals to deal with cold-related illnesses and injuries.	Priority 4	PDMAs	NDMAs, DDMA's, District Administration, INGOs and UN	Priority 4 involves training healthcare professionals to manage cold-related illnesses and injuries. PDMA leads this initiative, collaborating with NDMAs, DDMA's, District Administration, INGOs, and UN. Additionally, stockpile medical supplies and gender inclusive hygiene management kits, and coordinate with hospitals
		Stockpile medical supplies and coordinate with hospitals and clinics to ensure continued healthcare services during snowstorms.				
		Maintain stockpiles of essential supplies, including food, water, medications, and fuel, in strategic locations.				

						and clinics to ensure continued healthcare services during snowstorms
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e. Forest Fire

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		
				Main	Support Organizations	Action
Integrated Fire Management: Early Detection, Public Awareness, Communication, and Resource Collaboration	Formulate Early Detection Systems	Mapping of areas prone to forest fires	Priority 3	Forest department, PDMAs	DDMA, PMD, SPARCO, NDMA	Formulating Early Detection Systems for integrated fire management.
		Invest in early detection systems, including surveillance cameras and aerial monitoring.				Collaboration involves the Forest department and PDMAs, with support from DDMA, PMD, SUPARCO, and NDMA.
		Use satellite technology and drones to identify and				Actions include mapping areas prone to forest

		track potential fire hotspots.				fires to facilitate early detection and response.
Public Awareness and Safe Evacuation		Conduct regular awareness campaigns to educate the public about fire risks and safety measures.	Priority 4	DDMAs, PDMAs	Forest department, PDMAs	
		Develop guidelines on creating defensible space around homes and forest areas.				
		Develop and communicate clear evacuation plans for communities in fire-prone areas.				
		Conduct regular drills to ensure that residents and emergency responders are familiar with evacuation procedures.				
Communication Systems		Establish reliable communication systems to disseminate timely information about fire risks and evacuation orders.	Priority 2	DDMAs, PDMAs	Forest department, NDMA	Conducting regular awareness campaigns to educate the public about fire risks and safety measures. DDMAs and PDMAs lead this initiative, collaborating with the Forest department and other PDMAs.
		Utilize sirens, mobile notifications, and community networks for alerts.				

		Equip firefighting crews with proper training and equipment.				DDMAs and PDMAs lead this initiative, collaborating with the Forest department and other PDMAs. The goal is to enhance public awareness and promote safe evacuation practices of women, children, older people and the disabled; in the event of a forest fire.
	Firefighting Resources	Collaborate with neighboring districts to share firefighting resources during large-scale incidents.	Priority 2	District administration	Forest department, Rescue1122, DDMAs, PDMAs	

f. Tsunami

Strategy	Interventions	Actions	Linkages with SFDRR	Execution Agency		Action
				Main	Support Organizations	
Developing/Revising the Tsunami Hazard / Risk Assessment Database	Establishment of a committee for the evaluation of earthquake faults and the practice of fault evaluation.	Announcement and selection of the committee members	Priority 4	NDMA	Academic, PEC	NDMA leading the establishment of a committee for the evaluation of earthquake faults. The process includes announcing and selecting committee members, with collaboration from Academic institutions and the Pakistan
		Hold regular meetings for institutionalization		NDMA	Academic, PEC	
		Assessing the active and non-active faults and their mapping		NDMA	Academic, PEC	

						<p>Engineering Council (PEC). Regular meetings are held for institutionalization, with participation from NDMA, Academic institutions, and PEC.</p> <p>The committee assesses active and non-active faults and maps them, with support from NDMA, Academic institutions, and PEC.</p>
	Updating of the tsunami and inundation simulation (by scenario earthquakes)					Suggested for long-term planning
	Developing simulation models for damage and loss estimation on the basis of tsunami risk assessment (by scenario earthquakes)					
	Develop tsunami risk assessment for Gwadar city / Karachi city at micro-scale					
	Updating of tsunami hazard by probabilistic approach					
Mainstreaming Tsunami Risks in the Development Plans	Revise the Gwadar / Karachi development plan based on tsunami risk assessments and reflect them in land use planning					Suggested for long-term planning
	Developing scenario-based tsunami risk reduction plans and their integration into the tsunami investment and evacuation plans					

	Developing tsunami evacuation plans for major cities based on the results of tsunami risk assessments.	Develop guidelines for evacuation plans				Suggested for long-term planning
		Carry out consultations and validations with major stakeholders				
		Conduct tsunami drills on safer evacuations	Priority 2	Dev authorities/ MCs	PDMA Balochistan, DDMA and TMA	Developing guidelines for evacuation plans. Develop gender-inclusive evacuation plans. Carrying out consultations and validations with major stakeholders. Conducting tsunami drills with vulnerable populations on safer evacuations. Developing evacuation maps for major cities.
		Develop evacuation maps for major cities		Dev authorities/ MCs	PDMA Balochistan, DDMA and TMA	
		Reporting of a lesson learned and its dissemination				Suggested for long-term planning
Enhancing Tsunami Early Warning System	Engaging electronic and print media personnel for tsunami EWS and its outreach to the tsunami	Identifying relevant media platforms for early warning dissemination, studying the bottlenecks, and suggesting recommendations	Priority 2	PDMA	PEMRA, press clubs, electronic and print media agencies	Engaging electronic and print media personnel for tsunami EWS and its reach out to tsunami hazard-prone areas.

	hazard-prone areas	for improvement of EWS			
		MOUs signing with the TVs, radios, and important newspapers	PDMAs	PEMRA, press clubs, electronic and print media agencies	Identifying relevant media platforms for early warning dissemination, studying bottlenecks, and suggesting improvement recommendations for EWS.
		Enhancing communication networks through seminars, drills, and training	PDMAs	PEMRA, press clubs, electronic and print media agencies	Signing MOUs with TVs, radios, and important newspapers to ensure effective dissemination of early warnings to the most vulnerable populations.
		Defining SOPs disseminating the tsunami EWS and developing thresholds for evacuation	PDMAs	PEMRA, press clubs, electronic and print media agencies	PDMA leads this effort, collaborating with PEMRA (Pakistan Electronic Media Regulatory Authority), Press clubs, electronic and print media agencies.

Reducing the Impact of Tsunami Hazard	Construction of seawalls Construction of Groynes/riprap	Suggested for long-term planning
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3. Multi-Hazard Early Warning System

Strategy	Intervention	Action	Linkages with SFDRR	Execution Agency		
				Main	Supervision/Support	Actions
Multi-Hazard Early Warning System	Strengthen Forecasting and Early Warning System	Strengthen Weather Observation Network Including AWS, Radars, Upper Air Observation and Satellite.	Priority 2	NDMA	PDMA	Strengthen the weather observation network by enhancing AWS, radars, upper air observation, and satellite systems. Establish forecasting centers, such as the RFFWC and Urban/Flash Flood Early Warning Center in major cities. Enhance flood forecasting and early warning systems, focusing on GLOF. Strengthen earthquake and tsunami forecasting and early

						warning systems, collaborating with GSP and PDMA. Improve forecasting and early warning systems for landslide, cyclone, heatwave, marine, drought, and extreme weather events.
		Establish Forecasting Center Including RFFWC and Urban/Flash Flood Early Warning Center in Major Cities.		NDMA	PDMA, FFC	Strengthen the weather observation network by enhancing AWS, radars, upper air observation, and satellite systems. Establish forecasting centers, such as the RFFWC and Urban/Flash Flood Early Warning Center in major cities. Enhance flood forecasting and early warning systems, focusing on GLOF. Strengthen earthquake and tsunami forecasting and early warning systems, collaborating with GSP and PDMA. Improve forecasting and early warning systems for landslide, cyclone, heatwave, marine, drought, and extreme weather events.
		Strengthen Flood Forecasting and EWS Including GLOF.		NDMA	PDMA, IRSA, WAPDA	PDMA, IRSA, WAPDA collaboration with NDMA

		Strengthen Earthquake & Tsunami Forecasting and EWS.		NDMA	GSP, PDMA	GSP, PDMA collaboration with NDMA
		Strengthen Forecasting and EWS Including Landslide, Cyclone, Heat Wave & Marine, Drought and Extreme Weather.		NDMA	PDMA	NDMA: Strengthen forecasting and early warning systems for landslide, cyclone, heatwave, marine, drought, and extreme weather. Implement measures to improve preparedness and response of vulnerable populations especially women, adolescent girls, elderly and the disabled to these hazards.
	Prepare Emergency Response for	Strengthen Early Warning Dissemination System between PMD, DMAs and Other Agencies or Departments.	Priority 2	PMD	PDMA, DDMA	PDMA: Collaborate with NDMA to enhance forecasting and early warning systems for various hazards. Strengthen the early warning dissemination system between PMD, DMAs, and other relevant agencies or departments.
		Develop National Plan, Guidelines and SOPs for EWS and HEPR		NHSRC	NDMA, PDMA,	Strengthen the early warning dissemination system, collaborating with PDMA and DDMA to ensure effective communication and coordination during emergencies.
Anticipatory Action (AA)	AA Framework	Establishment of Tech Wing	Priority 4	NDMA	NDMA PDMA UN INGO's	NDMA collaborates with PDMA, UN, and INGOs to establish a Tech Wing within the Anticipatory Action (AA) framework.

		Development of National AA Strategy	Priority 4	NDMA	NDMA PDMA UN INGO's	<p>NDMA works with PDMA, UN, and INGOs to develop a National Anticipatory Action Strategy within the AA framework</p> <p>NDMA in collaborations with aforementioned stakeholders to develop & implement AA guidelines/ advisories to relevant stakeholders & agencies.</p> <p>NDMA develops Gender-Inclusive AA Guidelines/Advisories for humanitarian stakeholders.</p>
		Second National Dialogue Platform	Priority 4	NDMA	NDMA PDMA UN INGO's	Organizing a Second National Dialogue Platform within the Anticipatory Action (AA) framework, with active participation from NDMA, PDMA, UN, and INGOs.

