GOVERNMENT OF PAKISTAN
PRIME MINISTER'S OFFICE
NATIONAL DISASTER MANAGEMENT AUTHORITY
ISLAMABAD
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F. No. 786/NDMA/IA&PD/2024 Islamabad 13th, June 2025

Subject: **Monsoon Infrastructure Advisory (8/25)– Metropolitan Areas**

1. Pakistan is widely recognized as **one of the most vulnerable countries in the world to the devastating effects of climate change with monsoon rains representing a critical and recurring threat** to the nation's infrastructure, economy and public safety. Over the past decades, the country has experienced escalating losses due to unpredictable floods and intense rainfall, which have resulted in **widespread damage to residential areas, transportation networks, agricultural lands and essential infrastructure**. These disasters have not only caused significant human suffering but have also inflicted severe economic repercussions, with billions of dollars lost in terms of property damage, crop destruction and reduced productivity.

2. **Metropolitan areas, in particular, face a heightened level of risk** due to their dense population centers and the vulnerability of their aging infrastructure, which is often ill-equipped to withstand extreme weather events**. The rapid urbanization of these areas, coupled with insufficient urban planning and drainage systems**, exacerbates the potential impact of monsoon rains and floods. To mitigate these risks, **proactive measures are critical** by which Pakistan can significantly enhance its capacity to recover from natural disasters and adapt to the increasingly unpredictable effects of climate change.

3. The Monsoon Outlook for July to September (JAS) 2025 indicates that **metropolitan cities across Pakistan are expected to experience varied rainfall patterns and above-normal temperatures**. Cities in southern and central regions such as **Karachi, Hyderabad, Lahore and Multan** are likely to receive normal to slightly above-normal rainfall, with the highest positive departures projected in northeastern Punjab, including **Lahore and surrounding areas**. **Islamabad and Rawalpindi may also experience above-normal rainfall** due to their location near northern Punjab. In contrast, metropolitan areas in the northern regions, including **Peshawar and Gilgit**, may receive normal to slightly below-normal rainfall. Meanwhile, temperatures across all major cities are expected to remain above normal,

with the most significant warming projected in northern cities such as Islamabad, Peshawar and Gilgit.

4. To **enhance resilience against future flood events**, it is highly recommended that relevant authorities conduct **Infrastructure Audits**. These audits should focus on **identifying weaknesses** in public buildings, particularly those constructed with substandard materials, unreinforced masonry or those suffering from poor maintenance. **The results of these audits will provide a basis for retrofitting and reinforcing critical infrastructure**, allowing for targeted investments to fortify key structures prior to the monsoon season. **By prioritizing the retrofitting of schools, hospitals and government offices**, the risk of structural failure and loss of life during flooding events can be significantly minimized.

5. In the light of expected situation, **following actions are to be ensured for Residential and Public Buildings** by all concerned Federal Ministries / Departments, respective Provincial Governments and their line departments:

a. All District Disaster Management Authorities (DDMAs) and district administrations should **conduct proactive assessments to identify Kacha (mud) houses** within their districts, along with an estimate of their inhabitants. These vulnerable structures are **likely to sustain significant damage** during flooding, necessitating the provision of temporary shelters for affected residents.

b. Reinforce riverbanks using **effective protective measures such as retaining walls, riprap and geotextile reinforcement** to prevent breaches. These interventions will mitigate the risk of river water spilling into surrounding low-lying areas, particularly in flood-prone regions.

c. Integrate **rainwater harvesting systems** in both public and residential buildings, utilizing rooftop collection systems with storage tanks **to manage excess rainwater, reduce surface runoff and enhance water conservation** efforts during flood events.

d. In densely populated urban areas, the drainage systems must be upgraded to handle increased volumes of water. This **includes expanding stormwater drains, installing larger capacity sewer systems and incorporating green infrastructure solutions** such as bioswales and rain gardens to improve water absorption and reduce flood risks.

e. Implement smart flood control technologies in high-density urban centres. This includes the installation of **sensors and automated systems** that can monitor water levels in real-time, triggering alerts for preventive actions and managing floodwater more effectively.

f. **Enforce stricter building codes** in densely populated areas to ensure that all new buildings are designed with flood resilience in mind. This includes requirements for elevated foundations, waterproof construction materials and reinforced structural elements to withstand flooding.

g. Develop strategically located **community flood shelters in high-risk urban areas.** These shelters should be well-equipped to house displaced populations during flood events, providing safe havens with access to essential resources such as food, water and medical care.

h. Create and enhance **urban green spaces, such as parks and open areas**, in flood-prone urban areas. These spaces can help absorb rainwater, reduce runoff and act as natural barriers against floodwaters, while also improving the quality of life in dense neighbourhoods.

i. Promote the use of **underground water storage systems** in densely populated areas to capture excess rainwater. These systems can reduce surface runoff, alleviate the burden on public drainage systems and provide an additional water source during dry periods.

j. **Retrofit public buildings such as schools, hospitals and government offices** to enhance their flood resilience. This should include reinforcing structural elements with steel or concrete, elevating critical utilities and equipment, strengthening roof structures and apply waterproof coatings, including bituminous or lime-cement plaster, to the external walls and utilize flood-resistant sealants or coatings on the lower sections of the walls up to a height of 1.5 meters to enhance their resistance to water damage.

k. Place sandbags around the perimeter of homes as a **temporary flood barrier**. This measure will help prevent floodwaters from reaching the structure, providing additional protection for foundations and lower walls.

l. Launch **targeted housing improvement programs** for densely populated slums and informal settlements, which are particularly vulnerable to flooding. This may include providing financial support or low-cost solutions for retrofitting homes, elevating floors, and installing flood barriers.

m. Incorporate diagonal bracing, shear walls or steel reinforcement for **enhancing the structural integrity** to prevent collapse under hydrostatic pressure or lateral loads from floodwater.

n. **Upgrade utility networks** in urban areas, such as power, water and gas systems, to be flood-resistant. This includes **placing critical infrastructure above ground level or in protected enclosures** to prevent disruption during flooding events.

6. **The following actions are to be ensured for Communication Infrastructure** by all concerned Federal Ministries / Departments, respective Provincial Governments and their line departments:

a. Conduct comprehensive **inspections of roads, bridges, drainage systems and cross-drainage structures** ahead of the monsoon season to identify vulnerabilities, **clean debris** and ensure they are functioning properly to prevent blockages and water accumulation.

b. Strengthen critical road sections, bridges and vulnerable infrastructure, particularly in flood-prone areas, by **enhancing their resilience with reinforced materials and structural upgrades** to withstand damage from extreme weather events.

c. Establish **rapid-response teams** equipped with necessary tools and resources to carry out **emergency repairs** on roads and bridges during and after flooding events, ensuring quick restoration of services.

d. Construct **emergency access routes or bypasses** in high-risk areas where roads are more likely to be washed away or blocked by floodwaters, ensuring continued access during flood events.

e. Develop and implement **Standard Operating Procedures (SOPs) and contingency plans for rerouting traffic** in the event of road closures, ensuring smooth traffic flow and minimizing disruptions caused by flooding.

f. Install **scour protection**, such as gabions, riprap and reinforced concrete aprons, at vulnerable bridge piers and abutments and retrofit them with erosion-resistant materials to minimize damage from high water velocities.

g. **Retrofit and anchor bridge decks** to prevent displacement or structural failure due to the impact of floodwaters, ensuring the stability of critical infrastructure.

h. **Improve urban drainage systems** in densely populated areas by **expanding their capacity** to handle large volumes of floodwater, incorporating stormwater retention systems and ensuring regular maintenance to prevent flooding and surface runoff.

i. Safeguard roads in flood-prone hilly areas by implementing **slope stabilization techniques** like retaining walls, gabion structures, drainage improvements and the construction of catch drains and check dams to prevent landslides and erosion.

j. Install **permanent and temporary flood barriers** around key infrastructure such as roads and bridges in urban centres to protect vital communication routes from floodwaters.

k. Ensure **road signs, flood warnings and directional markers** in urban areas are reinforced and clearly visible during adverse weather conditions to improve traffic safety and navigation during floods.

7. **The following actions are to be ensured for Industrial Infrastructure** by all concerned Federal Ministries / Departments, respective Provincial Governments and their line departments:

a. Develop and regularly update comprehensive **evacuation plans** for all employees, clearly marking evacuation routes, assembly points and safe zones. Ensure that all personnel are trained in emergency evacuation procedures through regular drills and awareness campaigns.

b. **Regularly inspect and clean** all drainage systems to ensure they are free of debris and functioning optimally to prevent water accumulation. Upgrade existing drainage infrastructure where necessary to handle increased rainfall and stormwater runoff, ensuring the facility remains operational during heavy rains.

c. **Elevate vital machinery, electrical installations and key infrastructure** above expected flood levels. Apply waterproofing measures to critical equipment and power systems to prevent water damage, ensuring business continuity even during extreme weather events.

d. Set up **reliable, real-time communication channels** with the National Disaster Management Authority (NDMA), local meteorological agencies and other relevant bodies to receive timely flood alerts and updates.

e. **Ensure backup power for communication systems** to maintain connectivity during power outages.

f. **Digitize all critical operational records, blueprints, client data and other essential documents** and back them up securely on off-site servers or cloud platforms with multi-layered security measures. This will ensure that no data is lost in case of flood-related damage and that operations can resume quickly after an event.

g. **Establish and maintain direct lines of communication** with local disaster management authorities, fire departments and emergency services. Set up protocols for quick response to emergencies, ensuring that support can be mobilized swiftly if required.

h. Conduct a thorough assessment of all hazardous materials and chemicals stored at the facility. **Implement proper storage protocols**, including elevated shelving or containment systems and ensure that all chemicals are securely stored to prevent contamination in case of flooding.

i. Install **automatic circuit breakers and fire detection systems** in areas prone to short-circuits, particularly during flooding. Position fire extinguishers at key locations and ensure that staff are trained in using firefighting equipment and are familiar with safe electrical shutdown procedures to prevent fire hazards.

j. Perform **comprehensive structural integrity assessments** of industrial buildings, warehouses and manufacturing facilities before the monsoon season. Identify weak points and retrofit them with flood-resistant materials, reinforced foundations and structural reinforcements to ensure the building can withstand prolonged exposure to floodwaters.

k. Ensure that all concerned departments and facility managers **closely follow flood alerts and advisories** issued by the NDMA and local authorities. Establish a clear protocol for responding to flood warnings, including the mobilization of staff, evacuation procedures, and activation of emergency response measures.

l. **Install removable or temporary flood barriers around key areas** of the industrial site, such as loading docks, storage facilities and power stations, to protect them from floodwater inundation. These barriers should be easy to deploy in advance of predicted flood events.

m. **Implement advanced water management solutions** such as rainwater harvesting systems, stormwater detention ponds and water diversion channels to manage excess rainwater and prevent flooding within the facility. These systems will help mitigate the impact of sudden, heavy rainfall and flooding.

n. In anticipation of potential supply chain disruptions during floods, **stockpile essential materials, spare parts and emergency supplies** (such as food, water and first aid kits) at strategic locations within the facility. This will ensure continuity of critical operations during extended periods of flooding or road closures.

8. Forwarded for information / necessary action by all concerned, please.