SOUTH ASIA HYDROMET FORUM (SAHF) ANNUAL ASSESSMENT OF THE PAKISTAN METEOROLOGICAL DEPARTMENT

29 NOVEMBER 2024

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3
INTRODUCTION 4
OVERVIEW OF THE ASSESSMENT 5
Purpose and Objectives 5
Approach and Methodology 5
FINDINGS 6
1. Governance 6
2. Engagement with Stakeholders 6
3. PMD Capacity Development Against Best Practices 7
TECHNICAL ASSESSMENT 7
1. Meteorology 7
2. Agrometeorology 8
3. Hydrology 8
4. Seismic and Tsunami 8
5. Information Technology 9
SUMMARY OF KEY FINDINGS 9
ANNEX 1: SURVEY RESULTS 10

EXECUTIVE SUMMARY

This report presents the results of the South Asia Hydromet Forum's (SAHF) annual assessment of the Pakistan Meteorological Department (PMD), focused on evaluating the department's current capacities, challenges, and opportunities in delivering hydrometeorological services. The assessment aimed to provide a comprehensive understanding of PMD's strengths, operational gaps, and the necessary actions required to enhance its ability to address the increasing climate risks and extreme weather events facing Pakistan.

The assessment found that PMD has made considerable strides in improving its forecasting, observational infrastructure, and early warning systems, with notable achievements in areas such as flood forecasting, aviation meteorology, and agrometeorology. The department's ISO certification for aviation services and its growing role in multi-hazard impact-based forecasting (IBF) and specialized weather modeling tools are testament to its evolving capabilities. However, significant gaps remain, particularly in the areas of infrastructure modernization, data integration, and inter-agency coordination.

Key challenges identified include outdated and fragmented observational systems, insufficient expansion of automated weather stations, and the lack of a coordinated approach in managing hydrological data across provincial and federal agencies. Additionally, PMD's visibility and recognition as a leading scientific institution remain limited, particularly in its engagement with national and regional stakeholders.

The assessment highlights the need for strategic investments in critical observing systems, enhanced coordination between relevant agencies, and capacity-building initiatives to strengthen PMD's institutional framework. Specific recommendations include upgrading radar systems, expanding the network of automated weather stations, implementing structured stakeholder engagement mechanisms, and investing in human resources to ensure long-term sustainability.

INTRODUCTION

PMD plays a pivotal role in providing weather, climate, and geophysical services crucial for public safety, disaster risk reduction, and socioeconomic development in Pakistan. Established to support the nation's preparedness for weather-related events, PMD's mission is to improve the quality of life, property, and the environment by increasing safety on land, sea, and air. As a leader in meteorology and hydrometeorology, PMD serves diverse sectors including agriculture, aviation, water resources, energy, tourism, and health, contributing significantly to disaster management, climate change monitoring, and early warning systems. PMD has achieved notable progress in modernizing its infrastructure and enhancing service delivery. It holds ISO 9001-2008 certification, underscoring its commitment to quality management and continuous improvement. PMD also provides specialized aviation meteorological services, offering critical route forecasts, airfield weather information, and aviation hazard reporting to support the aviation sector. Additionally, the department's extensive network of meteorological stations, radar systems, and high-performance computing resources form the backbone of its operational capabilities, enabling it to deliver accurate and timely forecasts. With a broad mandate, PMD's services extend to a wide range of governmental and non-governmental organizations, including the National Disaster Management Authority (NDMA), the Ministry of Climate Change, and various provincial flood commissions. The department's expertise is central to managing the impacts of extreme weather events, including floods, droughts, cyclones, and heatwaves, through early warning systems and climate-based advisories.

PMD's Current Capacity and Achievements

PMD's operational framework includes dedicated early warning systems, a robust observational network, and advanced radar technology to monitor and predict severe weather patterns. The department has successfully expanded its observational infrastructure, including the installation of weather surveillance radars and automatic weather stations across the country. These advancements have significantly enhanced PMD's ability to provide real-time data and issue timely warnings, thereby reducing the risk to lives and property.

In terms of capacity-building, PMD has embarked on several developmental projects aimed at modernizing its hydrometeorological services. The "Modernization of Hydromet Services of PMD in Pakistan" (MHSP) is a flagship project that focuses on improving forecasting systems, upgrading weather radars, and expanding the network of automated weather stations. This project is critical in ensuring that PMD can meet the growing demand for accurate weather information, particularly in light of the increasing frequency of extreme weather events due to climate change. Among PMD's key achievements are the establishment of specialized forecasting systems, such as the Impact-Based Forecasting (IBF) system, which provides actionable weather information with a focus on potential impacts, particularly for sectors like agriculture. The development of mobile applications, such as the Kisaan Mobile Application, has further enhanced PMD's outreach, providing timely weather updates to farmers, which is vital for improving agricultural practices and minimizing weather-related losses.

As PMD continues to strengthen its infrastructure and expand its range of services, it remains a cornerstone of Pakistan's efforts to address climate risks and promote resilience against the adverse impacts of extreme weather events. The SAHF Annual Assessment aims to evaluate the progress of these initiatives, identify existing challenges, and recommend strategic actions for further strengthening PMD's capacity to support national climate resilience goals.

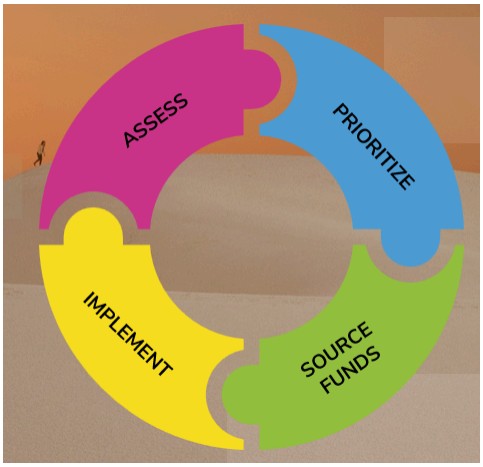
OVERVIEW OF THE ASSESSMENT

Purpose and Objectives

The primary purpose of the annual assessment was to evaluate the current operational and strategic capacities of the PMD and to identify residual gaps and areas where additional resources and investments are required. This exercise aimed to provide a baseline analysis of PMD's strengths, gaps, and future opportunities across various technical and institutional areas, such as meteorology, hydrology, agrometeorology, and early warning systems.

Specifically, the objectives were to:

a. Assess PMD's existing capacities, resources, and challenges in providing comprehensive hydromet services
b. Assess ongoing programs and the specific gaps which will be addressed through these programs
c. Assess the immediate needs of optimal and critical observing systems for efficient monitoring and detection of changing weather characteristics across all service sectors
d. Assess needs of expanding NWP efforts to operate all targeted extreme weather linked to IBF and DSS tools
e. Identify specific gaps in capacity, infrastructure, and technical capabilities that require attention
f. Offer recommendations to support strategic planning and targeted investment in areas of critical need.



Approach and Methodology

The assessment followed a structured, participatory, and forward-looking approach, integrating both qualitative and quantitative inputs:

- **Stakeholder Engagement**: Discussions were held with PMD leadership and staff, as well as with relevant ministries, donor institutions, and technical agencies, to gather perspectives on institutional strengths, challenges, and collaboration mechanisms.

- **Survey Questionnaire**: A targeted survey was conducted among PMD personnel to gather standardized responses on governance, resource adequacy, institutional planning, inter-agency engagement, and use of climate information.
- **Presentations and Open Discussions**: PMD's achievements and strategic direction were presented by senior officials, followed by interactive discussions to capture feedback, identify gaps, and validate observations.
- **Benchmarking Against Best Practices**: PMD's current capacities were compared with regional and global standards, particularly focusing on successful models such as ISO-certified NMHSs and centers of excellence.
- **Gap and Opportunity Analysis**: Findings from the survey and discussions were synthesized to identify institutional gaps, opportunities for engagement with sectoral users, and priority actions for policy, technical, and operational enhancement.

FINDINGS

1. Governance

The governing framework of PMD reflects a traditional structure wherein it functions as a department under a federal ministry. While several legislative instruments exist such as the PMD Act (1965), Climate Change Policy (2012), and the NDMA Act (2018)—the legal foundation remains fragmented, with key laws either unapproved or lacking the clarity needed to define PMD's evolving mandate. The absence of an updated, consolidated Meteorology Act has resulted in limited institutional authority, especially in areas related to regulatory oversight of meteorological infrastructure and inter-agency coordination.

Strategic, operational, and risk management provisions are acknowledged in national policies; however, their practical implementation within PMD is inconsistent. Risk assessments and progress reporting tend to be ad hoc, often occurring only in the context of specific projects or donor requirements. Development planning is typically centralized, led by the Director General and the Ministry, with project approvals routed through the Ministry of Aviation and the Planning Commission. Survey responses and stakeholder consultations highlight the need to strengthen this process through more structured stakeholder engagement, including technical experts, regional directorates, and internal directorate leadership. Recommendations point to the formation of expert committees and the decentralization of planning to ensure strategic alignment, institutional accountability, and technical rigor.

While government budget allocations (PKR 3.76 billion for FY 2024–25) support core operations, they remain insufficient to cover long-term infrastructure upgrades, technological enhancements, and human resource sustainability. Staffing gaps remain in critical units, and the transition from project-based staffing to permanent roles is often underfunded. This undermines PMD's ability to sustain services beyond the lifecycle of externally funded initiatives.

2. Engagement with Stakeholders

PMD maintains collaborative relationships with several sectoral stakeholders, including the National Disaster Management Authority (NDMA), Provincial Disaster Management Authorities (PDMAs), agricultural departments, and sectoral ministries such as those responsible for climate change, water resources, and aviation. However, the nature of engagement remains primarily reactive, with PMD often providing data upon request, rather than being systematically integrated into sectoral planning processes.

The department contributes to national climate-sensitive development frameworks such as the Nationally Determined Contributions (NDCs), National Adaptation Plan (NAP), and Disaster Risk Management (DRM) strategies. In most cases, PMD's role is supportive, with technical inputs provided to lead agencies such as the Ministry of Climate Change. Despite this, PMD's identity as a principal scientific institution is not always clearly reflected in public communications or policy documents. For instance, warnings and forecasts are frequently issued through NDMA or PDMA channels without attribution to PMD, diluting institutional visibility and public recognition.

There is strong potential to enhance engagement through structured mechanisms. These include expanding the use of digital platforms (e.g., the Kisaan mobile app), conducting user needs assessments, integrating PMD's data into national planning cycles, and establishing formal feedback systems. Particular attention should be given to community-level outreach, where information dissemination is currently mediated by intermediary agencies, often without a feedback loop to PMD. Strengthening these linkages will ensure that climate information is not only accessible but actionable, timely, and user-driven.

3. PMD Capacity Development Against Best Practices

PMD has made measurable progress in aligning its operations with regional and global best practices. The department maintains partnerships with several international agencies, including the China Meteorological Administration (CMA), Japan Meteorological Agency (JMA), International Centre for Integrated Mountain Development (ICIMOD), Japan International Cooperation Agency (JICA), Korea International Cooperation Agency (KOICA), and UN-affiliated institutions. These partnerships have supported advancements in forecasting technologies, observational infrastructure, and capacity building for PMD personnel.

Best practices adopted by PMD include the implementation of multi-hazard impact-based forecasting (IBF), the development of specialized weather modeling tools, and integration of satellite data for enhanced monitoring and prediction. However, institutional capacity development remains uneven across departments. Survey findings suggest that PMD would benefit from a more structured institutional learning agenda, including formal staff exchange programs with other NMHSs, enhanced training opportunities, and regular participation in regional knowledge platforms. Moreover, there is a need to standardize and calibrate observational instruments in line with World Meteorological Organization (WMO) guidelines to ensure data quality and global interoperability.

Looking ahead, PMD is well-positioned to transition into a regional center of excellence, particularly in flood forecasting, impact-based weather services, and capacity development. Realizing this vision will require a combination of strategic policy backing, sustained investment, and institution-wide alignment with globally endorsed operational frameworks.

4. Technical Assessment

a. Meteorology

PMD has made notable advancements in meteorological operations, particularly within aviation services, where it holds ISO 9001:2008 certification. This accreditation reflects PMD's adherence to internationally recognized quality management standards and positions it as a model among regional National Meteorological and Hydrological Services (NMHSs). The department has significantly expanded its observational infrastructure through the deployment of S-band Weather Surveillance Radars in Islamabad and Karachi, an X-band radar in Mardan, and the establishment of a Specialized Medium-Range Weather Forecasting Center (SMRFC). Additionally, hybrid weather stations have

been installed under international collaborations, including initiatives supported by China and Japan. Despite these achievements, a critical challenge persists: the proliferation of non-calibrated observation stations by external entities, often without coordination or approval from PMD. This fragmentation undermines data integrity and national forecasting standards. In response, PMD has proposed regulatory reforms to standardize observational infrastructure and is actively working to expand its Automated Weather Station (AWS) network and forecasting capacities under ongoing development projects.

b. Agrometeorology

PMD has progressively strengthened its agrometeorological services to support climate-resilient agricultural practices. The introduction of IBF, with initial implementation in the Pothohar region, enables a shift from traditional threshold-based alerts to impact-specific advisories tailored for farmers. The launch of the Kisaan Mobile Application further facilitates the timely dissemination of localized weather information to farming communities. These efforts are contributing to improved decision-making in areas such as crop planning, irrigation scheduling, and pest control, thereby enhancing agricultural productivity and reducing climate-related risks. However, current outreach remains limited in scale, with a majority of information transmitted via provincial agriculture departments rather than through direct engagement with end users. Furthermore, the absence of a systematic feedback mechanism constrains service refinement and impact evaluation. To ensure sustained value, it is imperative to broaden direct-to-user communication channels and establish structured feedback loops that inform service delivery and policy planning.

c. Hydrology

Hydrological forecasting forms a core component of PMD's mandate, particularly through the operations of the Flood Forecasting Division (FFD). The department provides regular hydrological advisories during the monsoon season and produces seasonal water availability forecasts critical to agricultural and disaster risk reduction planning. While PMD collaborates with national entities such as the Federal Flood Commission (FFC), inter-agency coordination at the provincial level remains inconsistent. Several departments operate independent monitoring systems without alignment to PMD standards, resulting in data discrepancies that can compromise decision-making. To address this gap, PMD is implementing a series of strategic initiatives, including the installation of Weather Surveillance Radars in Multan and Sukkur, the establishment of six Regional Flood Forecasting and Early Warning Centers (RFEWCs), and the expansion of urban flash flood early warning systems in major cities. These interventions are expected to enhance hydrological monitoring and improve the timeliness and reliability of flood forecasting services nationwide.

d. Seismic and Tsunami

In the domain of geophysical monitoring, PMD is responsible for the national seismic and tsunami early warning systems. Through international collaboration, notably with the China Earthquake Administration, PMD has upgraded the Pak–China Seismic Network and continues to operate a countrywide network of seismic stations. The department's geophysical services are supported by a cadre of technically qualified professionals, including post-graduates and doctoral-level experts in seismology and related disciplines. Despite having the technical capacity and statutory mandate, PMD's visibility during disaster events is often limited, as public communications and attributions are frequently issued through other agencies. This undermines PMD's role as the primary provider of scientific data and reduces institutional coherence in disaster risk communication. There is a pressing

need for a clear inter-agency protocol that recognizes PMD as the authoritative source for seismic and tsunami warnings, ensuring both clarity and public trust during critical events.

e. Information Technology

PMD has invested in information and communication technologies to support data dissemination and public engagement. The department utilizes digital platforms, including mobile applications, web portals, and social media channels, to relay real-time weather updates and warnings to both sectoral users and the general public. The Kisaan Mobile App exemplifies PMD's commitment to user-oriented service delivery, particularly in the agricultural sector. The effectiveness of these platforms was evident during the 2022 floods, where PMD received recognition from the World Meteorological Organization (WMO) for the accuracy and timeliness of its forecasts. Nonetheless, current IT infrastructure remains constrained in terms of data processing capacity, system integration, and cybersecurity. Additionally, PMD continues to face institutional branding challenges, as its data is often used by partner agencies without attribution, diminishing public recognition of its role. To strengthen institutional capacity, PMD has prioritized enhancements in data assimilation systems, model calibration, and the development of secure, interoperable digital services that can support multisectoral decision-making and elevate PMD's profile as a scientific authority.

RECOMMENDATIONS

To strengthen PMD's institutional effectiveness and service delivery, the following priority actions are recommended:

1. Strengthen Governance: Enact the Meteorology Act to formalize PMD's mandate, regulate private weather services, and enhance inter-agency coordination. Increase technical stakeholder involvement in development planning and streamline approval processes. Conduct annual capacity assessments to align budgeting with strategic priorities and long-term institutional goals.

2. Enhance Stakeholder Engagement: Establish formal data-sharing protocols and proactively integrate partners into planning processes. Improve PMD's public visibility to ensure proper attribution of forecasts. Institutionalize feedback mechanisms and expand community outreach to enhance service relevance and uptake.

3. Align with Best Practices: Develop a structured capacity development framework based on WMO guidelines. Pursue ISO certification for additional technical areas to enhance credibility and generate revenue to support broader departmental needs. Position PMD as a regional hub for forecasting excellence and capacity building.

4. Expand Technical Capacity:

- *Meteorology:* Standardize and calibrate the observational network to meet WMO standards and counter unregulated third-party data.

- *Agrometeorology:* Leverage collaborations with agricultural extension services and NGOs to broaden community-level outreach and ensure that farmers in remote areas receive timely, actionable information. Introducing feedback loops will help refine forecast dissemination.

- *Hydrology:* Assert PMD's role as the authoritative source for hydrological forecasts, and upgrade modeling systems to enable the department to deliver more precise and timely flood warnings.

- *Seismology:* Clarify PMD's role in national disaster policy and establish joint dissemination protocols with disaster management authorities to ensure coherence of information and reduce public confusion during emergencies.

- *IT:* Co-develop decision support systems with domain experts and address infrastructure, cybersecurity, and data integration gaps.

CONCLUSION

PMD has demonstrated strong foundational capacity in delivering hydrometeorological services. However, challenges such as limited legal authority, weak feedback mechanisms, and under-recognition from partners and stakeholders continue to restrict PMD from reaching its potential. Several strategic interventions are proposed, beginning with the enactment of the Meteorology Act. Engagement with stakeholders must shift from transactional to collaborative by developing formal partnerships, strengthening visibility campaigns, and establishing systematic feedback loops. Capacity development should be embedded in all ongoing and new initiatives, supported by ISO certification expansion and international partnerships. Infrastructure investments must prioritize radar modernization, AWS network expansion, and upgrades to seismic and tsunami systems. Finally, strategic planning must be strengthened through the development of a 10-year roadmap, regular institutional assessments, and value-based investment cases that resonate with ministries and development partners.

With ongoing investments such as the Modernization of Hydromet Services Project and an experienced technical workforce, PMD is well-positioned to become a regional center of excellence.

ANNEX 1: SURVEY RESULTS

A. GOVERNANCE

Q1: What is the placement of the NMHS in the government structure?

- An independent body under a ministry (1 response)
- A department/unit under a ministry (9 responses)

Q2: Does policy (law, decree or other legislations) exist that frames the mandate of the NMHS?

- Yes (7 responses)
- No (2 responses)

If yes, please list the law/decree or other legislation exist that frames the mandate of NMHS?

- Schedule-III, Rule 4 (IV), of the Rules of the Business 1973
- 4th Schedule Article 70(A) of the Constitution of Pakistan (mandate to collect the data and perform met forecast)
- PMD Act 1965 (strategic)
- WMO Member
- Climate Change Policy 2012 (strategic)
- NDMA Act 2018 (strategic)
- National calamities Act 1958

Q3: Do these, or any other relevant policies, define strategic, operational, and risk management plans, and the assessment and reporting thereof, as part of oversight and management?

- Yes (9 responses)
- No

If yes, what are the provisions relevant to strategic, operational, and risk management plans?

- Met data collection/disaster risks mitigation, etc.
- Under early warnings and national disaster management plans as per relevant policies
- Strategic: PMD Act 1965, NDMA Act 2018, CC Policy 2012
- Operational: FFD & warning, local forecasting
- Risk: DRR, PMD risk management unit
- SOP/operational for aviation, operation hydrology (floods), seismic/tsunami information exist
- Under climate policy and NDMA plan, to work and monitor weather situation and alerts
- NDMP 2024; NFPP IV (FPSP-III)
- Under climate policy, NDMA, and FFC plans FFD works

If assessments and reporting are done against strategic, operational, and risk management plans, how often are these done and what are the reporting arrangements?

- Risk assessment is done along with reporting plans as and when required
- As and when required, reporting is done. Currently not sufficient.
- For development (PSDP) projects, the planning commission (MoPDSI) holds quarterly, half yearly and full year review meetings to discuss progress of various projects. PMDs projects are also discussed in detail.
- During monsoon, FFD disseminates bulletins and daily basis and disseminate warning when required, also FFD provide water availability for kharif and rabi seasons

Q4: Do these policy provisions sufficiently support the current strategic, operational, and risk management trajectory of PMD?

- Yes (4 responses)

- No (5 responses)

If yes, how?

- Support but not sufficiently
- Because PMD Act (Meteorology Act) is not yet approved.
- Enhanced risk forecasting, proactive disaster preparedness increased infrastructure/technology
- Training/Coordination
- Yes, it requires further improvement in the domains of flood management, and transboundary data (water flow data)
- But not sufficiently
- PMD formulate the concept clearance proposals of various development (PSDP) projects in light of policies and plans, etc. framed for disaster management

If no, why?

- Support but not sufficient
- PMD act not yet approved
- PMD Act not approved

Q5: Who conceptualizes and approves development decisions for PMD?

- Ministry, in consultation with PMD DS and relevant staff (1 response)
- DG, in consultation with relevant (7 responses)
- All department (PSDP) projects are forwarded to Ministry of Aviation from PMD for concurrence. The projects are approved by the planning commission (MoPDSI).

Q6: Can this process of conceptualization and approval of development decisions for PMD be improved?

- Yes (9 responses)
- No

If yes, how?

- With the engagement/consultation of experts for better implementation of development decisions
- Study of gap analysis with regional directors' involvement and by proper feedback mechanisms.
- Efficiency, accountability, stakeholder investment, reserve allocation
- Through engagement of experts in various sectors
- There should be a committee of experts at PMD so that development projects be made more focused
- Involvement of directorates, their role and empowerment (committee of experts)
- The process of approval of development projects is cumbersome and involves bureaucratic hurdles
- Involvement of directorate, their role and empowerment

Q7: Does government annual allocation sufficiently cover the requirements of PMD for its yearly operational requirements, including human resource, capacity building/enhancements, operationalization and maintenance of observation stations, forecasting equipment/computing systems, and others relevant?

- Yes (7 responses)
- No (1 response)

If yes, how much are these allocations?

- The regular budget of PMD is 3759.722 million Pakistan Rupees. Apart from this, Government of Pakistan also provides sufficient funds in development projects of PMD.

- Non-ERE budget is increasing
- Budgetary allocations are sufficient for employees related to matters, however, for the developments, repair and maintenance are not sufficient enough
- Non-development budget increasing
- Rs. 3.7 million for 2024-25 (fiscal year)

If no, how much is PMD's minimum annual requirement for different units/category of work?

- It should be as per budget assessment per annum.
- As per annual requirement submitted to government
- Annual requirement submitted to government

Q8: Does PMD have sufficient staff to effectively deliver its mandate/services?

- Yes (5 responses)
- No (3 responses)

If yes, how is PMD sustaining these human resources?

- Around 2500 officers/officials with observation centers across around 100 placed, PMD officers/officials are regularly trained through national and international capacity building trainings
- Shortage of staff at RMC Peshawar
- Govt provides salaries through federal government funds to the staff of PMD

If no, what are the barriers to meeting and sustaining these required staff and capacity requirements?

- Because of financial constraints of the government
- Need staff in different observatories for observations
- Insufficient resources
- In various development projects, the requisite human resource is not fully provided after completion of these projects. Unlike other infrastructure projects, the projects of PMD require optimal human resource after completion of projects to maintain their working/operations

B. ENGAGEMENT WITH SECTORAL STAKEHOLDERS

Q1: What are the existing policies that support your engagement with stakeholder sectors?

- National framework for climate services (NFCS) (3 responses)
- PMD is in constant contact with National Disaster Management Authority (NDMA), Islamabad and all provincial disaster management authorities of all the provinces, respective agricultural departments of provinces, Federal Flood Commission (FFC) of Pakistan, Ministry of Climate Change, aviation sector, marine sector, etc.
- Climate Change policy.
- Collaboration with sectoral ministries and agencies, e.g., agriculture, water resources, power sector,
- PMD coordinates with NDMA, PDMA
- No framework exists yet, only climate policy exists
- Coordination with FFC, NDMA
- The national disaster management plan (NDMO) and national flood protection plan (NFPP-IV)
- Framework exists

Q2: What are the existing mechanisms at integrating PMD's climate information of various timescales into sectoral plans and decisions? Please identify:

- This is being developed in MHSP project funded by World Bank
- Through NDMA, PDMA, web service, social media, electronic and print media.
- Provision of climate data through EWS
- Capacity building and infrastructure
- Aviation sector, agriculture sector, water resources management, energy, irrigation, DRR, national planning and development, etc.
- Sharing PMDs information through electronic print media, social apps
- Underway in MHSP

Q3: Have there been best practices at integrating PMD's climate information of various timescales into sectoral plans and decisions?

- Yes (6 responses)
- No

If yes, what are these?

- 6-7 Weather Surveillance Radars (WSR) are being installed for better future preparedness regarding disaster risk management.
- Agriculture Sector, NDMA
- Downscaling climate models
- Infrastructure development/capacity building
- Aviation services save ample revenue owing to accurate met info, lead time. IBF improves the livelihood of the people and contribute in socioeconomic development of the country. Agromet services delivery save finances on pesticides, watering, and sowing practices
- Agriculture sector, NDMA
- Sufficient funds are allocated for PMDs development under the NFPP-IV and FPSP-III. There are the sectoral plan and projects, respectively
- Agriculture, NDMA

If no, why?

- Because it is under the Ministry of Climate Change as per Climate Change policy
-

Q4: Is PMD involved in the following climate-sensitive national development priorities?

Nationally Determined Contribution to the Paris Agreement (NDC):

- Yes (4 responses)
- No (2 responses)

If yes, how?

- PMD provides information to the Ministry of Climate Change under Paris Agreement
- Climate monitoring and data provision, climate projection, DRR/EWS, mitigation strategies
- PMD provides vital information to MOCC under Paris agreement
- MoCC under Paris agreement

If no, why?

- Because this is under the Ministry of Climate Change as per climate change policy

- Mainly climate policy is leading one
- Mainly the climate department is leading by using PMD datasets

National Adaptation Plan (NAP):

- Yes (3 responses)
- No (2 responses)

If yes, how?

- PMD provides vital weather-related information for development of National Adaptation Plan
- PMD provides weather-related information
- PMD provides vital weather information to MoCC and decision makers to contribute to NAP

If no, why?

- As the leading ministry is Climate Change
- MoCC is leading on adoption plan
- Climate change department is leading

National DRM Strategy:

- Yes (4 responses)
- No (2 responses)

If yes, how?

- Provides weather information to NDMA/PDMA
- The NDMP (2012-22) and NDMP 20224 have strategic provision of priorities on DRM that are within the scope and purview of PMD

If no, why?

- As NMDA is leading.
- NDMA has DRM strategy
- NDMA has DRM strategy, NDMA and PDMA have that mandate

Q5: Are there avenues for enhancing PMD's participation in the above development priorities?

- Yes (6 responses)
- No

If yes, how?

- By provision of meteorological information to various government sectors.
- Well-defined roles of PMD of Climate Change Policy, National Action Plan, and DRM Strategies.
- Enhancing climate data analysis/provision
- Developing EWS
- As per prevailing govt policies plan, PMD also provides input in the form of development projects in the fields of hydromet, seismology, drought, GLOF, etc. to effectively in national DRM
- Well defined role of PMD in adaptation plans and DRM feedback
- The coordination between PMD and NDMA needs to be enhanced in terms of DRM and DRR
- Well-defined role of PMD in adaptation plan because PMD experts are well aware of climatology of Pakistan very well

If no, why?

-

Q6: Are there avenues for enhancing PMD's engagement with sectoral users/stakeholders?

- Yes (6 responses)
- No

If yes, what are these mechanisms?

- Through Kisan mobile app/ other IT dissemination tools.
- User need surveys, analysis of present resources of PMD consultation with stakeholders for development the testing and feedback.
- Kissan mobile app
- Enhancing PMD role in stakeholders decision and importance
- In the process of policy formulation on DRM and DRR, the government functionaries may take PMD on board

If no, does this mean that the current user engagement modalities are sufficient?

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C. PMD CAPACITY DEVELOPMENT AGAINST BEST PRACTICES

In strategically planning PMD's development trajectory, is PMD basing such to best practices in South Asia or other regions globally?

- Yes (3 responses)
- No (2 responses)

If yes, please specify the best practices referred to:

- PMD is in constant contact with various regional as well as global meteorological agencies especially China Meteorological Administration.
- Development of multi-hazard impact-based forecasting, data assimilation and verification of NWP and climate models.
- Advanced met technology
- Climate change monitoring, DRR, and EWS
- PMD is in contact with advanced countries met services and other regional and global institutions like CMA, JMA, JICA, KOICA, ICIMOD, ICTP, UNDRP, etc.
- PMD closely working with CMA and other

If no, can assistance be provided in order for PMD to be abreast of best practices among NMHSs globally? Please specify:

- Development of impact-based multi-hazard early warning forecast, NWPs
- Exchange of staff (on deputation or secondment basis) with other NMHSs
- Increasing training opportunities for PMDs staff
- Organizing seminars and conferences, etc. for researchers of PMD
- Calibration of observational instruments as per the international standards
- Development of IBF and NWFC product