



IFRAP
Integrated
Flood Resilience &
Adaptation Project



Ministry of Planning
Development &
Special Initiatives



INTEGRATED FLOOD RESILIENCE & ADAPTATION PROJECT

BASELINE ASSESSMENT REPORT **COMPONENT-II**

MONITORING & EVALUATION (M&E) CONSULTANT

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List of Acronyms

Acronym	Full Form
AWS	Automatic Weather Station
C-Band	C-Band Weather Radar
X-Band	X-Band Weather Radar
S-Band	S-Band Weather Radar
EWS	Early Warning System
FFD	Flood Forecasting Division
IFRAP	Integrated Flood Resilience and Adaptation Project
IRI	Intermediate Results Indicator
JV	Joint Venture
M&E	Monitoring and Evaluation
NWP	Numerical Weather Prediction
PAD	Project Appraisal Document
PDO	Project Development Objective
PMD	Pakistan Meteorological Department
RBMF	Results-Based Monitoring Framework
TOR	Terms of Reference

1. EXECUTIVE SUMMARY

This baseline assessment documents the pre-intervention conditions for Component-II (Strengthening Hydromet and Climate Services) of the Integrated Flood Resilience and Adaptation Project (IFRAP). Component-II focuses on system-level and institutional interventions implemented through the Pakistan Meteorological Department (PMD), with the objective of improving weather forecasting, early warning services, and climate risk preparedness.

The baseline adopts a reference-based, systems-oriented methodology consistent with good practice for institutional and technical service-strengthening projects. No primary surveys or technical audits were conducted at baseline; instead, reference conditions were established using project design documents, the revised Results-Based Monitoring Framework, and institutional understanding at project start.

Baseline conditions indicate that, prior to IFRAP interventions, hydromet observation coverage and system integration are constrained, particularly in western Pakistan, including Balochistan. Forecasting systems are operational, with an average forecast lead time of approximately three days, but are limited by observation density, data integration, and specialized modelling capabilities.

The baseline further establishes that no operational hydrological modelling based early warning system for hill torrents exists in Balochistan at project start. Proposed investments under Component-II, including nationwide deployment of Automated Weather Stations and installation or replacement of weather radars, are therefore designed to address identified coverage gaps and system limitations.

In relation to the Results-Based Monitoring Framework, the baseline clearly defines reference conditions for PDO-4 (Increase in weather forecast lead time) and system-level Intermediate Results Indicators (IRI-10, IRI-11, and IRI-12). Component-II's contribution to PDO-2 (People with enhanced resilience to climate risks) is indirect and system-mediated, with beneficiary counts to be consolidated at project level during implementation and endline using population data for areas covered by operational early warning systems.

Overall, this baseline provides a coherent and defensible reference framework for tracking progress under Component-II and for assessing the contribution of strengthened hydromet and climate services to IFRAP's resilience objectives.

2. INTRODUCTION AND BACKGROUND

The Integrated Flood Resilience and Adaptation Project (IFRAP) is designed to support recovery, resilience, and long-term climate adaptation in flood-affected and flood-prone areas of Pakistan following the 2022 floods. The project adopts a multi-component approach, combining investments in resilient infrastructure, institutional strengthening, climate services, and project management systems to reduce vulnerability to climate-induced hazards.

IFRAP is structured to address both immediate recovery needs and systemic gaps that limit Pakistan's capacity to anticipate, prepare for, and respond to future climate risks. Within this framework, strengthening hydrometeorological and climate services is a critical enabling intervention, as effective forecasting and early warning systems underpin risk-informed planning, disaster preparedness, and timely response across sectors and regions.

This baseline assessment forms part of the project's results-based monitoring architecture and establishes the reference conditions against which progress and outcomes under Component-II will be measured during implementation and at endline.

2.1 Overview and Scope

Component-II of IFRAP focuses on strengthening hydrometeorological and climate services through improvements in observation infrastructure, data management systems, forecasting capacity, and early warning dissemination. The component is implemented primarily through the Pakistan Meteorological Department (PMD) and is national in scope, with particular emphasis on addressing coverage gaps in western Pakistan, including Balochistan.

The interventions under Component-II include the installation and operationalization of weather radars and Automated Weather Stations (AWS), modernization of forecasting workflows, and the development of specialized early warning capabilities for flood-related hazards. These interventions are designed to enhance the availability, reliability, and timeliness of climate and weather information used by institutions and communities.

Unlike components that deliver direct community-level infrastructure or services, Component-II primarily generates system-level and institutional outcomes. Its benefits are realized indirectly through improved early warning services that reduce exposure and vulnerability to climate risks across covered geographic areas.

This baseline assessment establishes the pre-intervention conditions for Component-II, focusing on system availability, coverage, and capacity rather than population-level impacts, which will be assessed through regular monitoring and endline evaluation.

3. METHODOLOGY FOR ESTABLISHING THE BASELINE

Component-II of the Integrated Flood Resilience and Adaptation Project (IFRAP) focus on strengthening hydrometeorological and climate services through institutional, technological, and system-level interventions implemented by the Pakistan Meteorological Department (PMD). Given the nature of this component, the baseline does not involve direct household- or community-level beneficiaries, nor does it entail the creation of new physical assets at the community level at the outset of the project.

Accordingly, the baseline for Component-II has been established using a reference-based, systems-oriented methodology, consistent with good practice for monitoring and evaluation of institutional strengthening and technical service delivery projects. This approach is fully aligned with the Monitoring and Evaluation (M&E) Framework developed for IFRAP and clearly distinguishes between baseline reference conditions, regular monitoring, and endline assessment.

3.1 Baseline Approach

The purpose of the Component-II baseline is to document the pre-intervention status of hydromet and climate service systems against which progress under the project will be assessed. Rather than relying on primary surveys or technical inspections, the baseline establishes reference conditions based on project design documents, indicator definitions, and institutional understanding at the time of project commencement.

This approach recognizes that detailed technical validation, system inspections, and performance measurements are implementation-stage activities, to be undertaken through regular monitoring and verified progressively throughout the project lifecycle.

3.2 Sources of Baseline Information

Baseline conditions for Component II have been established using the following sources:

- **Project Design and Policy Documents:**

The Project Appraisal Document (PAD), Terms of Reference (TORs), and the revised Results Framework form the primary basis for defining the scope, intent, and indicators associated with Component II.

- **Indicator Definitions under the Results-Based Monitoring Framework:**

Specific attention has been given to Project Development Objective (PDO-4), **PDO-2**, and Intermediate Results Indicators (IRI-10, IRI-11, and IRI-12), ensuring that baseline conditions are defined strictly in accordance with indicator descriptions and measurement logic.

- **Institutional Understanding at Project Start:**

Baseline reference values reflect the prevailing operational conditions of PMD systems at the start of IFRAP, as understood through project preparation processes and coordination meetings.

No primary data collection, field inspections, or technical audits were conducted as part of the baseline exercise for Component II. Such activities are explicitly planned under regular monitoring and will inform midline and endline assessments.

3.3 Establishment of Baseline Reference Conditions

Baseline reference conditions have been defined as follows:

- **(PDO-2):** baseline conditions are established at the level of system availability, not direct beneficiary counts, as detailed in Section 3.4.
- **(PDO-4):** baseline conditions reflect the operational forecast lead time achievable under existing numerical weather prediction systems prior to IFRAP-supported upgrades.
- **(IRI-10 and IRI-11):** baseline conditions reflect limited coverage and system constraints prior to planned expansion and operationalization.
- **(IRI-12):** the baseline reflects the absence of an operational hydrological modelling-based early warning system in Balochistan at project start.

3.4 Methodological Approach for PDO-2

PDO-2 measures the number of people benefiting from flood protection infrastructure and early warning systems. Under Component-II, contributions to PDO-2 are indirect and system-mediated, as hydromet and early warning services function as public goods that enhance resilience across covered geographic areas.

At baseline, Component-II does not generate direct beneficiary counts. Instead:

- The baseline establishes the availability and functionality of early warning systems as the enabling condition for resilience enhancement.
- Population-level beneficiary numbers associated with PDO-2 will be derived during implementation and endline using:
 - official population census data and projections for areas covered by operational early warning systems, and
 - disaggregation by gender and youth, consistent with the PDO-2 sub-indicators.

Actual beneficiary counts will be consolidated at the project level, drawing on geographic coverage of early warning systems and population data, rather than estimated at Component-II baseline stage. This approach is consistent with the Results Framework definition of PDO-2 and avoids premature attribution.

3.5 Distinction between Baseline, Monitoring, and Endline

It is important to emphasize the distinction between different stages of the M&E process for Component II:

- **Baseline:**
Establishes system-level reference conditions for hydromet infrastructure, forecasting capacity, and early warning availability.
- **Regular Monitoring:**
Will document installation, operationalization, system integration, and geographic coverage of Component II interventions, forming the basis for assessing contributions to PDO-2 and other indicators.
- **Endline Assessment:**
Will assess changes relative to baseline reference conditions, drawing on verified monitoring data and documented system performance improvements achieved during project implementation.

This staged approach ensures methodological rigor, avoids duplication of effort, and maintains consistency with results-based monitoring principles.

3.6 Limitations and Scope

The Component-II baseline is intentionally confined to institutional and system-level conditions. It does not attempt to measure downstream impacts on communities or beneficiaries, as these effects are indirect and will materialize only after infrastructure upgrades, system integration, and operational improvements are implemented.

The baseline therefore serves as a reference framework for tracking improvements in forecasting capacity, infrastructure operationalization, and early warning systems under Component II, rather than as an assessment of impact at the population level. **Therefore, a conventional Baseline Survey is not required for this component and is acknowledged by the Project Implementation Unit (PIU) through its letter dated December 10, 2025.**

4. BASELINE CONDITIONS – HYDROMET INFRASTRUCTURE

Component II of IFRAP aims to strengthen hydrometeorological and climate services by expanding and modernizing observation infrastructure and improving system integration and utilization. Establishing baseline conditions for hydromet observation infrastructure is therefore essential to define the pre-intervention reference point against which progress under the project will be measured. For baseline reporting purposes, it is essential to distinguish between:

- **Baseline condition:** the pre-intervention situation characterized by limited hydromet coverage in western Pakistan, including much of Balochistan (as articulated in project design), and
- **IFRAP intervention footprint:** the proposed/target locations and configurations where new installations, upgrades, and operationalization will take place during implementation.

This chapter documents the starting conditions of hydromet observation infrastructure at the commencement of IFRAP, with particular focus on coverage, system characteristics, and geographic distribution relevant to Balochistan and other flood-relevant regions.

4.1 Role of Hydromet Observation Infrastructure

Hydromet observation infrastructure (including weather radars and Automated Weather Stations (AWS)) forms the backbone of weather forecasting, climate monitoring, and early warning services. These assets generate real-time meteorological data that feed into numerical weather prediction systems and support early warning dissemination for floods, flash floods, droughts, heatwaves, and snowmelt-related hazards.

At baseline, PMD operates a national hydromet network that supports routine forecasting and monitoring functions. However, the effectiveness of these services is influenced by spatial coverage, data density, interoperability, and system integration, particularly in regions characterized by complex terrain and climate variability, such as Balochistan.

4.2 Proposed Radar Footprint Under IFRAP (IRI-10)

Under Component-II, four radar sites are planned to address baseline coverage gaps and restore legacy capacity for installation/operationalization:

1. Dera Ismail Khan
2. Lahore (replacement of an older radar installed in 1991 that is currently abandoned/non-functional, as per project discussions)
3. Gwadar
4. Quetta

This planned footprint reflects a combination of

- (i) restoring/modernizing legacy capacity (Lahore replacement) and
- (ii) strengthening monitoring reach for key regions including the southwest (Gwadar/Quetta) and adjoining catchments influencing flood-relevant weather systems.

This planned footprint will be tracked under IRI-10 (Weather radars installed and operationalized) through implementation-stage validation and operational readiness verification.

4.3 RADAR Typology and Intended Functional Roles

Under the Integrated Flood Resilience and Adaptation Project (IFRAP), the Component-II is modernizing its network with advanced weather surveillance radars to enhance flood warning and weather forecasting accuracy.

Radar Types and Specifications:

- **S-Band Radars:** Used for long-range surveillance and monitoring intense weather systems, as they are less affected by attenuation from heavy rain. Under IFRAP two Radars of S-Band will be installed one in Lahore and the other in Gwadar
- **C-Band Radars:** These radars provide a balance between range and resolution, making them effective for regional weather monitoring and rain detection. A site evaluation for a C-band radar has specifically been conducted in D.I. Khan.
- **X-Band Radars:** Used for high-resolution, short-range monitoring, particularly useful for local flash flood warnings and detailed storm analysis.

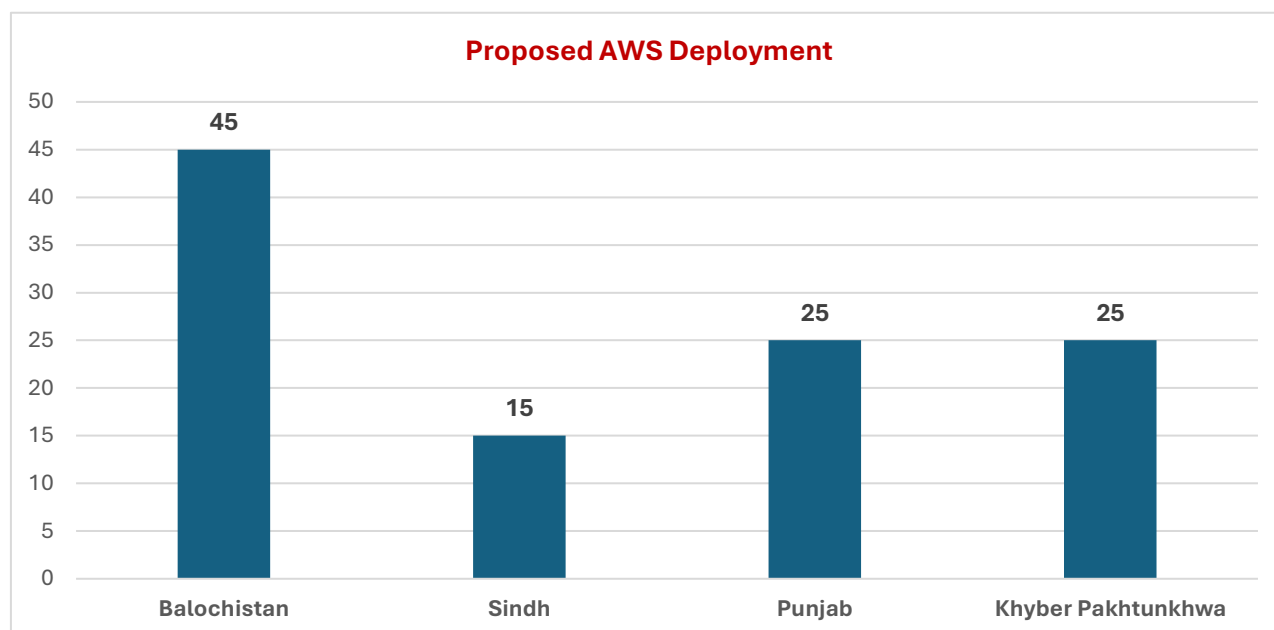
Configuration and Features:

- **Weather Surveillance Radars (Fixed and Mobile):** The initiative includes both fixed installations and mobile units to provide flexible and comprehensive coverage across the country.
- **Technological Capabilities:** The systems are being designed and reviewed for advanced principles including:
 - **Doppler Radar:** To measure the velocity of precipitation and detect wind patterns.
 - **Dual-Polarization Radar:** To distinguish between different types of precipitation (e.g., rain, snow, hail) and improve rainfall estimation.
 - **Phased Array Radar:** Some technical specifications involve the understanding and potential integration of phased array technology for faster scanning.

4.4 Proposed AWS Deployment Footprint Under IFRAP (IRI-11)

The proposed AWS deployment plan under IFRAP is nationwide (not limited to Balochistan). The provided deployment list reflects the planned placement of AWS across provinces, including:

- Balochistan (45 sites)
- Sindh (15 sites)
- Punjab (25 sites)
- Khyber Pakhtunkhwa (25 sites)



This nationwide footprint is consistent with the component rationale that strengthening observation and forecasting systems yields benefits beyond a single province by improving national forecasting capability while addressing significant coverage gaps in the west.

The proposed/approved AWS sites provide the planned coverage reference for implementation planning and will be used as the basis for monitoring the achievement of IRI-11 (Automatic Weather Stations installed and operationalized) once installation and operationalization occur

4.5 Proposed AWS Coverage in Balochistan

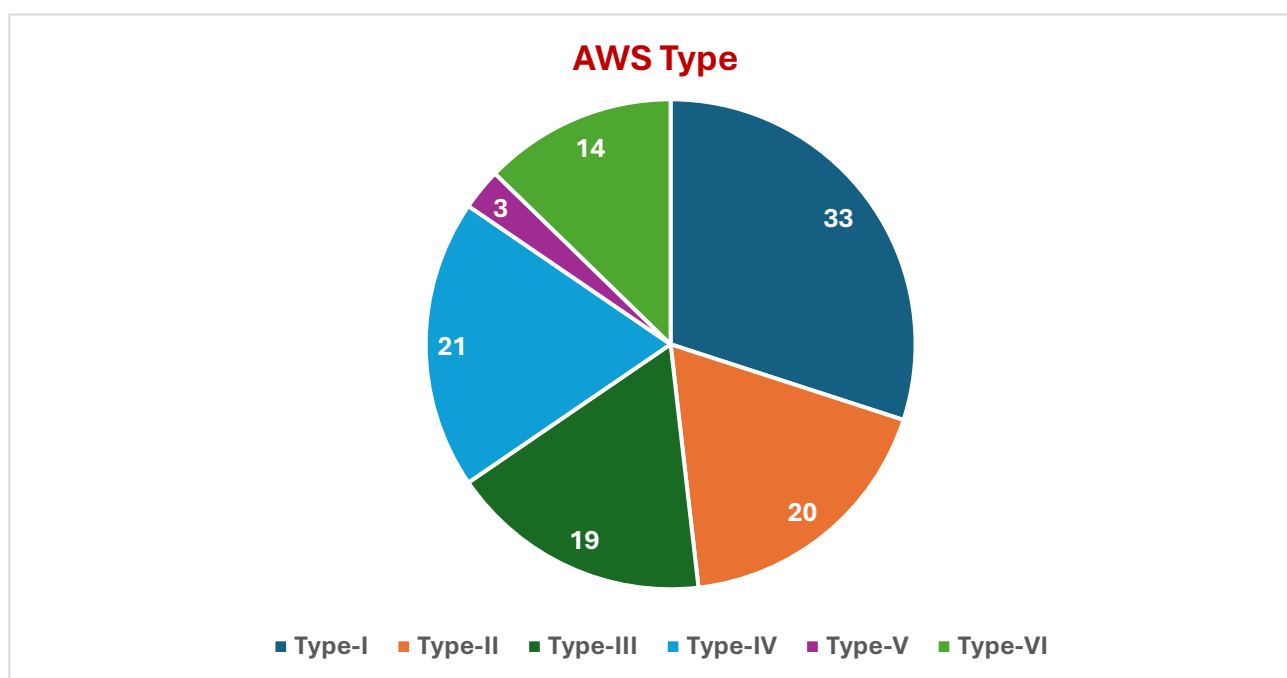
The proposed AWS deployment for Balochistan (45 sites) spans a wide set of districts and tehsils, targeting coastal zones (e.g., Gwadar/Ormara/Pasni), upland and highland locations (e.g., Ziarat), and flood-relevant districts in the Naseerabad division belt (e.g., Naseerabad, Jaffarabad, Jhal Magsi). The intent of this distribution is to improve observation density across diverse climatic and hazard contexts and strengthen the data foundation needed for localized warnings, including in flash flood and hill-torrent relevant settings.

This distribution will be validated during implementation through station installation verification, functionality checks, and data transmission confirmation as part of regular monitoring.

4.6 AWS Typology and Intended Functional Roles

The proposed AWS network under IFRAP includes multiple AWS types (Type-I to Type-VI), each configured for different monitoring objectives.

- Type-I (33 sites)
- Type-II (20 sites)
- Type-III (19 sites)
- Type-IV (21 sites)
- Type-V (3 sites)
- Type-VI (14 sites)



This typology reflects a design approach to collect the right data in the right location, supporting early warning for floods, droughts, snowmelt, heatwaves, and air quality hazards:

- **Type-I:** Equipped with core sensors (rain gauge, wind, humidity/temperature, solar radiation, pressure). Ideal for basic climate monitoring and flood/drought early warning in low-risk or semi-urban areas. Supports daily weather forecasts, rainfall monitoring, and temperature-based alerts.
- **Type-II:** Adds ceilometer, visibility, and air quality sensors to the Type-I configuration. Suited for urban centers, airports, and industrial regions. Enhances aviation safety, pollution monitoring, and severe weather alerts for urban areas.
- **Type-III:** Includes snow sensors in addition to Type-II features. Primarily used in high-altitude areas where snow accumulation affects water resources and flood risk. Supports avalanche and snowmelt-based flood early warnings.
- **Type-IV:** Adds soil moisture and temperature sensors, plus evaporation measurement, targeting agricultural regions. Enables drought monitoring, crop water management, early warning for soil-related hazards and precision agriculture advisories
- **Type-V:** Combines all Type-IV sensors with evaporation and lysimeter measurements. Critical for detailed hydrological studies, irrigation planning, and water resource management. Supports precise agricultural advisories, drought early warnings, and crop stress alerts.
- **Type-VI:** Self-recording automatic rain gauge with full communication. Focused on remote or high-risk areas where rainfall data is the most critical parameter. Provides real-time precipitation data for flash flood alerts and rapid-response early warning for localized heavy rain events

This typology is presented here as design intent; the operational effectiveness and integration of each installed station will be assessed through implementation-stage monitoring.

4.7 Baseline Note on “Operationalization”

Consistent with the Results Framework, “installed and operationalized” implies more than physical placement: it requires functional readiness and operational use. Therefore, while Chapter 3 presents the planned footprint, the confirmation of operationalization for IRI-10 and IRI-11 will be established only through regular monitoring data once installations are completed and integrated.

5. DISCUSSION IN RELATION TO THE RESULTS-BASED MONITORING FRAMEWORK

This chapter discusses the baseline conditions established for Component II in relation to the Revised Results-Based Monitoring Framework (RBMF) of IFRAP. The purpose of this discussion is to clarify how the baseline reference conditions align with the defined Project Development Objective and Intermediate Results Indicators, and how they provide a clear and measurable foundation for tracking progress during implementation and assessing outcomes at endline.

Component-II indicators are predominantly system-level and institutional, and their measurement relies on changes in capacity, coverage, and operational performance over time rather than on direct household-level outcomes. Accordingly, the baseline discussion focuses on defining starting reference points, consistent with indicator definitions and measurement logic.

5.1 Alignment with Project Development Objective (PDO-2)

PDO-2: People with Enhanced Resilience to Climate Risks

PDO-2 measures the number of people benefiting from flood protection infrastructure and early warning systems designed to enhance resilience to climate risks. Under IFRAP, this indicator captures outcomes generated through both physical risk-reduction investments and system-level interventions that improve preparedness and response.

Component II Contribution to PDO-2

Component-II contributes to PDO-2 indirectly, through the strengthening of hydrometeorological observation, forecasting, and early warning systems. These systems function as public goods, improving the availability, timeliness, and reliability of climate and flood risk information for populations residing within the geographic coverage of operational early warning services.

At baseline, Component II does not directly generate beneficiary counts. Instead, its contribution to PDO-2 is realized through:

- expansion and improved spatial coverage of early warning systems;
- increased forecast lead time and reliability;
- enhanced ability of institutions to issue timely alerts for flood and climate-related hazards.

These improvements reduce exposure and vulnerability to climate risks for populations in covered areas, thereby contributing to enhanced resilience outcomes measured under PDO-2.

Baseline Interpretation

At baseline, the contribution of Component-II to PDO-2 is defined by the availability and coverage of early warning systems, rather than by quantified population figures. The baseline establishes that early warning coverage and system effectiveness are constrained prior to IFRAP interventions, particularly in western Pakistan, including Balochistan.

Population-level beneficiary numbers are therefore not established at baseline for Component-II.

Measurement and Disaggregation Approach

During implementation and at endline, beneficiary counts under PDO-2 will be consolidated at the project level, drawing on:

- the geographic coverage of operational early warning systems supported under Component-II; and

- official population census data and projections for covered areas.

Disaggregation by gender and youth, as required under PDO-2 sub-indicators, will be derived from population statistics applied to coverage areas. This approach is consistent with the PDO-2 definition, which allows the use of actual counts where feasible and recognizes the public-good nature of early warning systems.

Component-II's role is therefore to enable and strengthen the systems through which resilience benefits are delivered, while population-level accounting is undertaken in an integrated manner across all relevant project components.

5.2 Alignment with Project Development Objective (PDO-4)

PDO-4: Increase in Weather Forecast Lead Time of PMD

PDO-4 measures the increase in the number of days of weather forecast lead time generated by the Pakistan Meteorological Department. Lead time is defined as the period between the issuance of a forecast and the occurrence of the predicted meteorological phenomena.

Baseline Reference Condition

At baseline, PMD's operational forecasting systems provide an average forecast lead time of approximately three days. This reflects the prevailing capacity of existing numerical weather prediction systems, observation data availability, and operational workflows prior to IFRAP-supported interventions.

Interpretation within the RBMF

The three-day lead time constitutes the baseline reference value for PDO-4. The RBMF end-target of five days represents an incremental improvement to be achieved through:

- expansion and densification of observation infrastructure,
- improved data integration and system interoperability, and
- strengthened forecasting workflows and operational capacity.

Progress under PDO-4 will therefore be assessed by measuring changes relative to this baseline reference during implementation and at endline, using verified monitoring data.

5.3 Alignment with Intermediate Results Indicator IRI-10

IRI-10: Weather Radars Installed and Operationalized

IRI-10 tracks the number of weather radars installed and operationalized under the project.

Baseline Reference Condition:

At baseline, weather radar coverage exists but is limited in geographic reach and density, particularly in Balochistan and western Pakistan. Existing coverage does not fully support real-time monitoring of localized precipitation systems across all flood-prone areas.

Interpretation within the RBMF:

The baseline condition establishes that progress under IRI-10 is not defined solely by the procurement or installation of radar units, but by their operationalization and integration into forecasting and early warning systems. Monitoring under this indicator will therefore assess both physical deployment and functional use relative to the baseline coverage and capability.

5.4 Alignment with Intermediate Results Indicator IRI-11

IRI-11: Automatic Weather Stations (AWS) Installed and Operationalized

IRI-11 measures the number of AWS installed and operationalized by PMD.

Baseline Reference Condition:

At project start, the AWS network supports national forecasting operations; however, station density and spatial distribution are uneven, with notable gaps in Balochistan. Baseline conditions also reflect constraints in capturing localized climatic variations relevant to flash floods and hill torrents.

Interpretation within the RBMF:

The baseline establishes a reference point against which the expansion, operationalization, and effective use of AWS will be measured. Progress under IRI-11 will therefore be assessed not only in terms of the number of stations installed, but also their contribution to improved data availability and forecasting capacity relative to baseline conditions.

5.5 Alignment with Intermediate Results Indicator IRI-12

IRI-12: Hydrological Modelling–Based Early Warning System Established for Hill Torrents in Balochistan

IRI-12 is a binary (Yes/No) indicator measuring the establishment of a hydrological modelling–based early warning system for hill torrents.

Baseline Reference Condition:

At baseline, PMD does not have an operational hydrological modelling–based early warning system for hill torrents in Balochistan. Existing forecasting practices do not include a dedicated, institutionalized model capable of generating hill torrent–specific early warnings.

Interpretation within the RBMF:

The baseline condition for IRI-12 is therefore “**No**”, providing a clear and unambiguous reference point. Achievement of this indicator will be assessed based on the development, testing, and operationalization of a hydrological modelling–based system during project implementation.

5.6 Baseline Contribution to Results-Based Monitoring

The baseline conditions documented for Component-II collectively establish a coherent reference framework for results-based monitoring by:

- Clearly defining starting values for PDO-4 and system-level IRIs;
- Distinguishing between existing operational capacity and IFRAP-supported enhancements; and
- Ensuring that progress measurement is grounded in observable and verifiable changes over time.

These baseline reference conditions will inform regular monitoring activities and provide the benchmark against which endline outcomes under Component-II will be evaluated.

5.7 Summary

In summary, the Component II baseline aligns fully with the Revised Results-Based Monitoring Framework by:

- Establishing a clear baseline forecast lead time for PDO-4;
- Defining system-level starting conditions for hydromet infrastructure indicators (IRI-10 and IRI-11); and
- Setting an explicit baseline for the development of a hill torrent early warning system under IRI-12.

This alignment ensures methodological consistency, transparency, and accountability in tracking progress toward strengthening hydromet and climate services under IFRAP.

ANNEXURE – A

PIU-11(1)/2025
GOVERNMENT OF PAKISTAN
PAKISTAN METEOROLOGICAL DEPARTMENT
PROJECT IMPLEMENTATION UNIT (PIU)
**MODERNIZATION OF HYDROMET SERVICES OF PMD IN PAKISTAN/
 STRENGTHENING HYDROMET AND CLIMATE SERVICES**

Islamabad, 10th of December, 2025

✓ Mr. Rafay Durrani
 M&E Specialist, IFRAP
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Islamabad

Subject: **BASELINE SURVEY FOR IFRAP: COMPONENT-2**

With reference to our endorsement of M&E Revised Framework prepared by M&E Consultants (ref our email of 19th November, 2025), we agree with and endorse the methodology and approach outlined in the Revised Framework regarding Baseline consideration of Component-II,

2. As mentioned therein, the approach adapted by M&E Consultants is consistent with World Bank's good practice guidance for infrastructure and system-strengthening projects, wherein baseline conditions for technical systems are established through engineering and operational audits rather than population-based surveys.

3. Unlike Components 1 and 3, which involve community-level assets and direct beneficiaries, Component 2 (Strengthening Hydromet and Climate Services) focuses on institutional and technological infrastructure. Its interventions, comprising the installation and operationalization of Automatic Weather Stations (AWS), RADAR systems, and hydrological models, do not generate household or community-level baseline data. Therefore, a **conventional baseline survey is not required or methodologically justified for this component.**

4. The M&E consultant's role begins with technical validation and continues through periodic monitoring of system performance using the Meteorological Equipment **Functionality Form** developed by M&E Consultants which is already included in the Revised M&E Framework.

5. Assuring you to the best of our cooperation and support.


(Dr. Sajjad Haider)
Deputy Project Director

Copy for information and further necessary action

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ANNEXURE – B**List of AWS Sites**

Sr	Province	District	Tehsil	Location	Type
1	Balochistan	Loralai	Loralai	Levies Thana Dosarki Shabozai Loralai	T-1
2	Balochistan	Barkhan		Pilot Balloon Observatory	T-1
3	Balochistan	Dera Bugti	Dera Bugti	Livestock Office Dera Bugti	T-1
4	Balochistan	Washuk	Naag	Nag naib tehsildar office distt washuk	T-1
5	Balochistan	Awaran	Mashkay	tehsil Office Mashkay Awaran	T-1
6	Balochistan	Sibi	Sibi	MO Sibi	T-1
7	Balochistan	Killa Saifullah	Shinki	Shinkai irrigation rest house distt killa saif ullah	T-1
8	Balochistan	Musakhel	Kingri	DC Guest House Kingri	T-1
9	Balochistan	Ziarat	Sinjavi	District Headquarter Hospital sinjavi	T-1
10	Balochistan	Harnai	Shahrig	Rural Health center, Shahrig	T-1
11	Balochistan	Gwadar	Ormara	Irrigation Office Ormara	T-1
12	Balochistan	Gwadar	Pasni	Coconut Farm Pasni	T-1
13	Balochistan	Sherani	Sherani	Levies Thana Manikhwa District Shirani	T-1
14	Balochistan	Mastung	Mach	DHQ Mach	T-1
15	Balochistan	Khuzdar		Levies Thana Moola Khuzdar	T-1
16	Balochistan	Mastung	Kardigap	Tehsil Complex Assistant Comm Office Kardigap	T-1
17	Balochistan	Surab	Surab	XEN irrigation division surab	T-1
18	Balochistan	Khuzdar	Baghbana	Emergency Response Centre, Baghbana Khuzdar	T-1
19	Balochistan	Musakhel		Union Council Office Zam Muhammad Zai	T-1
20	Balochistan	Zhob	Zhob	Irrigation Rest House Sabakzai Dam sawara road Zhob	T-1
21	Balochistan	Quetta	Sadar	Quetta Airport, Quetta	T-2
22	Balochistan	Gwadar	Gawadar	Aeromet Observatory	T-2
23	Balochistan	Kalat	Kalat	Pilot Balloon Observatory	T-3
24	Balochistan	Ziarat	Ziarat	FAWS/FFD PMD Site	T-3
25	Balochistan	Barkhan	Rakhni	Agriculture eXT Office Rakhni Barkhan	T-4
26	Balochistan	Naseerabad	Dera Murad Jamali	Basic health Unit, Nautal Dera Murad Jamali	T-4
27	Balochistan	Jhal Magsi	Jhal Magsi	Irrigation Colony Jhal Magsi	T-4
28	Balochistan	Jaffarabad	Jhatpat	Irrigation Office and Colony	T-4
29	Balochistan	Naseerabad	Chattar	Irrigation Office Patt Feeder canal Mir Hassan Chattar	T-4
30	Balochistan	Zhob	Zhob	Pilot Balloon Observatory	T-4
31	Balochistan	Musakhel	Musakhel	Agriculture Office Musakhel	T-4
32	Balochistan	Killa Saifullah	Badini	Agriculture Farm Nasai Muslim Bagh	T-4
33	Balochistan	Lasbella	Lasbela	Irrigation Office Kandrach	T-4
34	Balochistan	Lasbella	Dureji	Omeedabad Municipality Office Omeedabad	T-4
35	Balochistan	Quetta	Quetta	RAMC Sariab Quetta	T-5
36	Balochistan	Khuzdar	Wadh	Municipal Office Civil Lines Wadh	T-6
37	Balochistan	Sibi	Lehri	Irrigation Office Lehri Sibbi	T-6
38	Balochistan	Kachi	Balanari	Nari Headworks Haji Shaher Nari River, Balnari	T-6
39	Balochistan	Kachi	Sani	AC office sani	T-6
40	Balochistan	Ziarat	Ziarat	Levies Thana Ziarat Choteer	T-6
41	Balochistan	Loralai		Levies Thana Mekhter District Loralai	T-6
42	Balochistan	Panjgur	Panjgur	Pilot Balloon Observatory	T-6
43	Balochistan	Dera Bugti	Phelwagh	DCO - Office Baiker	T-6
44	Balochistan	Musakhel	Musakhel	Levies Thana Toisar District Musakhel	T-6
45	Balochistan	Jhal Magsi	Mirpur	Tehsil Office Mirpur	T-6
46	Sindh	Dadu	KN Shah	Pumping Station KN Shah	T-1
47	Sindh	Kashmore	Kashmore	Guddu Thermal	T-1

Sr	Province	District	Tehsil	Location	Type
48	Sindh	Khairpur	Pir Gudu	Pumping Station, Taluka Kot Dejee	T-1
49	Sindh	Shikarpur	Gari Yaseen	DDA Office GhariYaseen	T-1
50	Sindh	Matiali	Hala	Irrigation Office HALA Sub Division	T-1
51	Sindh	Sanghar	Tando Adam	SDO Irrigation office Tando Adam, Sanghar bypasses Near Baba Floor Mill	T-1
52	Sindh	Tharparkar	Nagarparkar	Agriculture office/ AC office, Nagarparkar	T-1
53	Sindh	Mirpurkhas	Sindhri	Agriculture office/ AC office Sindhri	T-1
54	Sindh	Jamshoro	Sehwan	Sehwan Airport	T-1
55	Sindh	Karachi	Karachi	Airport Site	T-2
56	Sindh	Ghotki	Ghotki	Sindh Cotton Research Sarhad	T-4
57	Sindh	Neushero Feroz	Padidan	Met Observatory	T-5
58	Sindh	Dadu	Johi	FRB Sub Division Office	T-6
59	Sindh	Sajwal	Sajwal	Agriculture office/ AC office Sajawal	T-6
60	Sindh	Kambar Shahdadkot	Shahdadkot	XEN Office	T-6
61	Punjab	Jhang		Govt Boys High School	T-1
62	Punjab	Attock		Met Obsy Attock	T-2
63	Punjab	Rawalpindi		Govt Sarwar Shakeel College Gujar Khan.	T-2
64	Punjab	Mainwali		Office of Asst Director Agriculture Tehsil kucheary Mainwali	T-2
65	Punjab	Wazirabad		Govt. Molana Zafar Ali Khan Degree College Wazirabad.	T-2
66	Punjab	Sialkot		Met Office Sialkot A/P	T-2
67	Punjab	Gujrat		Govt, Associate College for boy Kharian	T-2
68	Punjab	Faisalabad		Agri Extension & irrigation Sherwana	T-2
69	Punjab	Sahiwal		Office of Asst Director Agriculture Arif Wala.	T-2
70	Punjab	Lahore		DD Agriculture Nankana Sahib	T-2
71	Punjab	Kasur		Met Obsy Sheikhupura	T-2
72	Punjab	Okara		Govt. Islamia Model High School Okara-Govt. Associate college for boys depalpur	T-2
73	Punjab	Multan		Multan AP	T-2
74	Punjab	Islamabad		PMD Head Office	T-2
75	Punjab	Gujranwala		Met Obsy Narowal	T-2
76	Punjab	Murree		Kohsar University Murree	T-3
77	Punjab	Chakwal		Office of Asst Director Agriculture (ext.) Talagang	T-4
78	Punjab	Bhakkar		Office of Asst Director Agriculture (ext.) Goharwala Road Mankera	T-4
79	Punjab	T.T. Singh		Seed Form Agriculture.	T-4
80	Punjab	Vehari		University of Agriculture Faisalabad Sub Campus Burewala	T-4
81	Punjab	Jampur		ADA (ext.) Jampur Near Post Office Jampur	T-4
82	Punjab	Layyah		Office of Asst Director Agriculture (east) Near DPO Office/Govt. College Layyah.	T-4
83	Punjab	Chakwal		Office of AD Agriculture	T-4
84	Punjab	Hafizabad		MO Hafizabad.	Type-V
85	Punjab	Taunsa Sharif		ADA (ext.) Taunsa Office Near Tameer Now Chowk Tub Road Taunsa	Type-VI
86	KPK	Charsadda		University	T-1
87	KPK	Karak		KKK Univ	T-1
88	KPK	Kohat		University	T-1
89	KPK	Peshawar		RMC	T-2
90	KPK	Saidu		MO Saidu	T-2
91	KPK	DIK		MO Dera Ismail Khan	T-2

Sr	Province	District	Tehsil	Location	Type
92	KPK	Swat		Gabin-Jabba	T-3
93	KPK	Dir Upper		Sheringal University	T-3
94	KPK	Shangla		ShanglaTop	T-3
95	KPK	Chitral		Lowari Top	T-3
96	KPK	Chirai Up		Shandur	T-3
97	KPK	Nathiagali		Govt. Degree College for Boys	T-3
98	KPK	Kalam		MO Kalam	T-3
99	KPK	Malamjabba		MO Malamjabba	T-3
100	KPK	Naran		MO Naran	T-3
101	KPK	Nwaziristan		Cadet College Razmak/Shawal Rifels	T-3
102	KPK	Ayubia		PTDC Motel	T-3
103	KPK	Swaziristan		Wana (FC Camp)	T-3
104	KPK	Battagram		Alai	T-3
105	KPK	Mansehra		Shinkyari Tea RF	T-3
106	KPK	Hangu		Samana/Tourism Deptt	T-3
107	KPK	Kurru		Maiki (Chapri Rest House)	T-3
108	KPK	Peshawar		Uni of Agriculture	T-4
109	KPK	Mardan		FFWS	T-4
110	KPK	Swabi		University of Swabi	T-4