WINDS MANUAL 2023

WINDS

Weather Information Network & Data System

**Pradhan Mantri
Fasal Bima Yojana**

Department of Agriculture & Farmers Welfare
Ministry of Agriculture & Farmers Welfare
Government of India

कृषि रक्षक

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14	Abstract (with Keywords)	Weather Information Network and Data System (WINDS) is a recent initiative of DA&FW to augment the weather data collection system in the country in terms of adequacy of network, data collection, data standardization, data hosting and dissemination thorough coordinated efforts with IMD and States. DA&FW constituted an Expert Committee to prepare a detailed road map for realization of WINDS in the current year. The committee has consulted different States, weather agencies, S&T institutions and other stakeholders and developed the current manual providing end-to-end guidelines for implementation of WINDS. **Keywords:** WINDS, AWS, ARGs, RWBCIS, Climate Change		

Preface

A robust weather monitoring system consisting of granular, standard quality and timely available weather datasets, is the need of the hour to strengthen (a) farmer advisory, (b) crop planning, (c) crop insurance, (d) disaster management, (e) crop yield modelling and (f) infrastructure planning etc. in Agriculture sector. Weather-based parameters are key inputs for forewarning and mitigation of climatic risks and catastrophic events and protect agriculture from such risks.

The existing weather infrastructure is not uniform among the states in respect of granularity, number of parameters measured and timeliness in the availability of data. Data gaps are widely reported across different states. As a result, weather data utilisation in agriculture sector is skewed among the states. In many cases, the existing datasets are also not being effectively utilised due to quality and accessibility limitations.

Due to growing importance of weather data in agriculture decision making, there is an urgent need to stream line weather data infrastructure, standardise the datasets and enable data utilisation. There is a need to increase the density of both Automatic Weather Stations (AWS) and Automatic Rain Gauges (ARG), despite challenges associated with that endeavour.

Accordingly, Department of Agriculture & Farmer Welfare (DA&FW), Ministry of Agriculture & Farmers Welfare (MoA&FW), initiated Weather Information Network and Data System (WINDS) for generation of long-term hyper-local weather data, and promote the same for wider applications in Agriculture and other sectors.

WINDS focuses on (a) augmentation of the network of weather data collection systems, (b) developing comprehensive guidelines for enhancing the density of weather network, (c) defining protocols for data quality management, (d) pooling weather data from multiple measurement sources to a centralised platform and (e) enhancing the end use of weather data in agriculture. Keeping in view the importance of WINDS initiative, the DA&FW has notified the Expert Committee for WINDS committee with the following mandate:

- Setting up of standards and specification for siting of AWS/ARGs, sensors used in AWS/ARGs and protocols for data synchronization based on the specific requirements of crop insurance sector after reviewing the relevant efforts made in this regard in the past.

- Creating a panel of agencies authorized to install and maintain the AWS/ARG under Weather Information Network Data System (WINDS).

- Propose a system for 3rd party evaluation and verification of AWS/ARG.

- Resolving conflicts of interest in the data generated from AWS/ARG.

- Ensuring creation of National level data base and establishing protocols for accessing the country-wide data by various stakeholders.

- Proposing amendments in the relevant guidelines, if required.

- Any other issues related to establishment of WINDS under PMFBY

The WINDS committee consists of the following Members;

S. No	Name of Expert	Designation
1	Dr. C.S. Murthy, Director MNCFC	Chair
2	Representative of NRSC	Member
3	Dr. Bimal Bhattacharya Head, AED, SAC ISRO	Member
4	Dr. AVM Subba Rao, Principal Scientist, CRIDA-ICAR	Member
5	Dr. C N Prabhu, Joint Director, Bihar Mausam Seva Kendra	Member
6	Dr. Sunil Kumar, Asst. Comm. DA&FW	Member
7	Shri. Uday Deshmukh, Project Manager (NHM), Pune, Maharashtra.	Member
8	Dr. K. S. Hosalikar, Head & Scientist – G, IMD -Pune	Member
9	Commissioner (Agriculture), Andhra Pradesh	Member
10	Commissioner (Agriculture), Rajasthan	Member
11	Dr. Sunil Dubey, Deputy Director, MNCFC	Member Secretary

The committee has consulted different weather agencies, State Depts, S&T Agencies and other stakeholders and developed the current report to serve as a manual for implementation of WINDS.

WINDS will be the national level platform integrating the existing infrastructure, data sources and expertise available with IMD, State Governments and Public/Private technical organization supporting multiple needs of GoI and States. Although PMFBY is currently notified under WINDS, there is scope for integrating all other schemes of GoI where weather plays an important role. Thus, WINDS initiative will be a game changer for enhancing weather data utilisation in agriculture decision making in the tropical countries like India, where weather variability is high.

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Abbreviations

AES	:	Advanced Encryption Standard
AI/ML	:	Artificial Intelligence/Machine Learning
ARG	:	Automatic Rain Gauge
AWS	:	Automatic Weather Station
BG	:	Banak Guarantee
B-QC	:	Basic Quality Control
BWS	:	Back-up Weather Stations
CCE	:	Crop Cutting Experiment
CRIDA	:	Central Research Institute for Dryland Agriculture
CROPIC	:	Collection of Real Time Observations and Photographs of Crops
DA&FW	:	Department of Agriculture and Farmers Welfare
DAS	:	Data Acquisition System
DL	:	Data Logger
EOI	:	Expression of Interest
GoI	:	Government of India
GP	:	Gram Panchayat
GVA	:	Gross Value Added
ICAR	:	Indian Council of Agriculture Research
IMD	:	India meteorological Department
IoT	:	Internet of Things
KSNDMC	:	Karnataka State Natural Disaster Monitoring Centre
KVK	:	Krishi Vigyan Kendra
MNCFC	:	Mahalanobis National Crop Forecast Centre
M&E	:	Monitoring and Evaluation
MoES	:	Ministry of Earth Sciences
MoA&FW	:	Ministry of Agriculture and Farmers Welfare
MOSDAC	:	Meteorological and Oceanographic Satellite Data Archival Centre
MoU	:	Memorandum of Understanding
NABCB	:	National Accreditation Board for Certification Bodies
NABL	:	National Accreditation Board for Testing and Calibration of Laboratories
NHM	:	National Horticulture Mission
NRSC	:	National Remote Sensing Centre

PMFBY	:	Pradhan Mantri Fasal Bima Yojana
PSU	:	Public Sector Unit
QC & QA	:	Quality Control and Quality Assessment
QAP	:	Quality Assurance Partner
QAS	:	Quality Assurance System
QCI	:	Quality Council of India
QMS	:	Quality Management System
RH	:	Relative Humidity
RMC	:	Regional Meteorological Centre
RUA's	:	Reference Unit Area's
RWBCIS	:	Restructured Weather Based Crip Insurance Scheme
RWS	:	Reference Weather Stations
SAC	:	Space Application Centre
SAU	:	State Agriculture University
SLA	:	Service Level Agreement
SOP	:	Standard Operating Procedure
TBRG	:	Tipping Bucket Rain Gauge
UT	:	Union Territory
VEDAS	:	Visualization of Earth Observation Data and Archival System
WLG	:	WINDS Local Guardian
WIP	:	WINDS Implementation Partner
WMO	:	World Meteorological Organization
WINDS	:	Weather Information Network Data System
YES-TECH	:	Yield Estimation System Based on Technology

Executive Summary

Weather data plays an important role in agriculture for decision making by farmers to policy makers. Recognizing (a) the growing importance of weather data in agriculture, (b) the gaps and asymmetries in the existing data collection networks, (c) the isolated efforts of different stake holders and (d) the lack of standard datasets, DA&FW has conceptualized a system "Weather Information Network and Data System (WINDS)". The objective of WINDS is to augment the weather data collection system in the country in terms of adequacy of network, data collection, data standardization, data hosting and dissemination thorough coordinated efforts with IMD and States.

Accordingly, DAFW constituted an Expert Committee to prepare a detailed road map for realization of WINDS in the current year. The committee has consulted different States, Weather agencies, S&T institutions and other stakeholders and developed the current report providing end-to-end guidelines for implementation of WINDS.

Currently, WINDS initiative has focused on PMFBY requirements alone and the future requirements of other schemes/programmes such as disaster management, agro-forestry etc can also be integrated with WINDS framework. As per the requirements of PMFBY, it is proposed that every Gram Panchayat should have an Automatic Rain Gauge (ARG) and every Block/Tahsil should have an Automatic Weather Station (AWS). The existing network of ARGs and AWS in the country are mapped and additional requirements are worked out. It is estimated that the number of new ARGs to be setup is around 2,00,000 and new AWS around 5,000 in all States/UTs. It is envisaged that the new network shall not overlap with the existing/proposed stations of IMD. Details of instrumentation, siting norms and site preparation are furnished for compliance.

Establishment of new network will be carried out by Winds Implementation Partner (WIP), to be selected through tender process. WINDS envisages rental model for new network. The existing network data will be brought in to WINDS platform, by paying the data cost to respective owners. Compliance of existing network to the WINDS guidelines is to be achieved in a stipulated timeframe.

Quality Assurance Partner (QAP) is identified for third party verification of network and data collection as per the protocols mentioned in this manual. Guidelines for calibration and validation, third party verification, payment system linked with work progress are furnished here. Penalty system for faulty/no data sets is also introduced. Details of WINDS platform for receiving the data transmitted by ARG/AWS, data checking and maintenance are also discussed.

Data ingestion, data storage and management, data processing, visualization and customization, data sharing modes and data security are fully described in this document.

Financial arrangement for implementing WINDS by states includes 90% share by GoI in first year followed by 80%, 60% and 50% in subsequent years. In case of North-eastern and Himalayan states, the GoI's contribution is 90% in all years.

Mahalanobis National Crop Forecast Centre functions as the secretariat of the WINDS committee for taking care of the day-to-day matters of WINDS implementation.

WINDS is expected to create a robust system of weather data infrastructure, first of its kind, in the country and will become a game changer in crop planning, advisories and crop risk management benefitting farmers and others in Agriculture sector.

SECTION 1
WINDS Manual

1. Introduction

India is a tropical country with high weather variability across the vast swath of its geography and variety of soils affording scope for diversity of agriculture. Climate (main components of which are water, air and sunshine) is the single most important factor in crop production and determines the appropriate timing for important agriculture operations like sowing, transplantation, irrigation scheduling and fertilizer application etc. Agriculture in India is important for people as well as economy, as it provides livelihood, directly or indirectly, to more than 50% population and contributes around 20% in Gross Value Added (GVA) of the country. Apart from food security for the second largest population in the world, it also plays important role in exports and plays a significant role in the overall socio-economic fabric of India.

Exogenous factors like climate, weather, biotic agents cause agriculture production risks leading to low and uncertain crop yields. Due to climate change or climate variability, occurrence of abnormal weather events is ever increasing, causing frequent crop loses in one part or other part of the nation. About 86 % of the total operational landholding in India is shared between marginal and small farmers holding less than Two Hectares of land. These farmers are therefore, most vulnerable to risk arising out of unforeseen natural calamities like drought, dry-spell, flood, untimely/inadequate/excess rainfall, frost, cyclone, thunderstorm, hailstorm, cold wave and pest and disease attack etc. Risk management in agriculture thus becomes imperative and critical looking at its socio-economic importance and for making agriculture economically viable and sustainable for the huge majority of small and marginal farmers. It has been estimated that, on an average, 20% of the annual production is lost due to pests, plant diseases and weeds. Crops on nearly 11.6 million hectares, on average are damaged every year by natural calamities and adverse seasonal conditions. Better management of agricultural risks is one of the important strategies to address the current challenges of food security, farm income security, and climate resiliency in Indian agriculture.

Long-term and hyperlocal weather data thus becomes essential for understanding, predicting, and responding to weather conditions, enabling individuals, organizations, and governments to make informed decisions to mitigate the impact of weather-related risks and to develop strategies for sustainable development. Furthermore, weather data plays a crucial role in scientific research, climate studies, and environmental monitoring. Weather data is collected from various sources and observations to provide details about atmospheric conditions and meteorological parameters at a given time and location. It includes measurements of temperature, humidity, precipitation, wind speed and direction, air pressure, cloud cover, and other relevant factors that characterize the current weather conditions. Weather data is collected through a variety of methods and instruments, including weather stations, satellites, weather radars, buoys, and weather balloons etc and help different industries to understand and predict weather patterns, monitor climate changes, and make informed decisions in sectors like agriculture, transportation, energy, and disaster management.

India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) is the nodal agency for providing weather data and agromet advisory in the country and maintains a large network of AWS/ARGs across the nation. Recently, a number of States/UTs Governments and other agencies have also established their own network of AWS/ARGs. However, the current density of the available AWS/ARG network is not adequate, with large gaps in granular level weather data coverage. Also, multiple sources of data from different agencies have limited inter-operability and are marred with data quality and data standardization issues. Further, the absence of an integrated platform for hosting weather data at national level, leads to underutilization of the existing weather datasets.

1.1. Weather information and Network Data System (WINDS)

WINDS is a programmatic initiative to strengthen weather data infrastructure in the country and to provide good quality weather datasets from a single digital platform. WINDS will enable

large scale use of weather variables in Agriculture.

WINDS will setup a robust mechanism to integrate weather data, pooled from different weather observation systems in the country, into a single national level WINDS portal. This digitally integrated platform for hosting long-term, hyperlocal, quality checked and reliable weather data will synergise the efforts and the data collected by different stakeholders for larger usage in risk mitigation strategies of the Governments and ensure seamless and near real time dissemination of services.

WINDS is a national level initiative which will integrate the existing infrastructure and expertise available with IMD, various State Governments and public/private technical organizations. In this connection, this document will act as a guide and manual for the concerned 'Stakeholders' implementing WINDS, i.e., the Centre, the States/UTs, IMD etc. It is proposed to install an AWS at Block/Tehsil/Taluk level and ARG at Gram Panchayat (GP) level. An institutional mechanism for implementation of WINDS, involving the WINDS Implementation Partners (WIPs), Quality Assurance Partners (QAPs), Dispute resolution system etc. is proposed in this document.

1.2. WINDS Applications

WINDS is a programmatic initiative to strengthen weather data infrastructure in the country and to provide good quality weather datasets from a single digital platform. WINDS will enable large scale use of weather variables in Agriculture.

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1.2.1. General Applications

The availability of long-term hyperlocal, accurate and reliable weather data is crucial for making informed decisions, managing risks, and planning for the future. Long-term weather data, also known as historical weather data, can be valuable in various applications, such as:

1. **Agriculture:** Farmers and agricultural researchers rely on long-term weather data for crop planning and to optimize crop management practices. By analyzing historical weather patterns, they can determine the best planting and harvesting times, adjust irrigation schedules, predict the likelihood of pest outbreaks and development of predictive models for yield forecasting. Historical weather datasets are also very crucial for both yield-based and weather-based crop insurance schemes. Decision makers can integrate weather information with agronomic models and algorithms for providing near real-time advisories to the farmers on crop management, irrigation, pest control, and other farming practices.

2. **Insurance and Risk Assessment:** Insurance companies utilize historical weather data to assess and mitigate risks associated with natural disasters. By analyzing long-term weather patterns, they can estimate the probability of events like hurricanes, floods, or

wildfires occurring in specific regions and determine insurance premiums accordingly.

3. **Disaster Management:** Long-term weather data plays a crucial role in disaster management by providing valuable insights into historical weather patterns, trends, and climate change impacts. It helps in risk assessment, preparedness planning, installation of early warning systems, and infrastructure development, etc.

4. **Climate Research and Environmental Studies:** Long-term weather data is crucial for studying climate patterns, trends, and changes over extended periods. Researchers analyze and model historical weather data to identify climate shifts, assess the impact of human activities, predict future climate scenarios and to monitor and assess the impact of climate change on ecosystems. By analyzing historical weather records, they can identify shifts in species distribution, track changes in habitats, and develop conservation strategies.

5. The long-term weather datasets are also useful in a number of other sectors as Urban Planning, Energy Sector, Transportation and Logistics, Tourism etc.

1.2.2.   WINDS for Agriculture Risk Assessment and Protection

1.2.2.1. Good quality long-term hyperlocal weather data play a crucial role in the crop insurance sector, PMFBY, RWBCIS and other crop insurance schemes and products in India:

1. **Risk Assessment:** Long-term weather data helps assess the risk associated with weather-related perils in specific regions. By analyzing historical weather patterns, crop insurance companies can identify areas prone to droughts, floods, hailstorms, frost, or other weather events. This information allows to evaluate the likelihood and severity of potential losses and set appropriate premiums and coverage levels.

2. **Actuarial Modelling, Underwriting, Pricing and Premium Setting:** Long-term hyperlocal weather data assists in the development of statistical models that estimate the probability and magnitude of crop losses due to various weather perils. These models help in taking informed underwriting decisions and help in policy pricing, coverage terms, and overall risk management strategies. This includes setting coverage limits, deductibles, and for setting pricing and premium based on the historical likelihood of weather-related losses for specific crops and regions.

3. **Weather index development and triggers for indemnity payment:** Weather data, such as rainfall, temperature, humidity and wind speed, collected from weather stations or satellite sources, is used to develop customized weather indices that correlate with crop growth, yield or specific crop risks (e.g., drought, excess rainfall, frost). It is further utilized to determine if the predefined thresholds or triggers for indemnity payments have been reached. Insurance payout are triggered when weather conditions deviate from the expected norms and adversely affect crop yields. Weather data helps in determining the timing and extent of crop losses and facilitating claims settlement. The Operational Guidelines of RWBCIS mandates to ensure 100% of weather data must be from Automatic Weather Station (AWS) and Automatic Rain Gauge (ARG) only.

4. **Crop Yield Estimation:** Weather parameters, such as precipitation, temperature, solar radiation and humidity, in combination with satellite remote sensing data are used to estimate crop yields. By analyzing historical weather patterns and using crop growth models, regression models or machine learning algorithms, relationships between weather variables and crop yields can be established for predicting potential crop yields in a specific region. Weather datasets are already used for crop yield estimation under PMFBY and forms and integral part of the YES-TECH initiative.

1.2.2.2. Leveraging weather data provides an efficient and transparent mechanism for crop insurance by enabling fair premium pricing, accurate yield estimation, efficient claims settlement, and effective monitoring of the insurance scheme.

1.2.2.3. Summary of weather datasets that are useful for capturing various crop risks are presented in **Table 1** below:

Table 1 : Summary of crop risks and related weather datasets

Sr. No	Risks	Weather variables
1.	Drought/Prolonged dry spell	Rainfall, Rainy days, Dry days
2.	Flood	Cumulative rainfall, rainfall intensity
3.	Cyclone	Cumulative rainfall, rainfall intensity, Wind speed
4.	Hailstorm	Rainfall
5.	Unseasonal rain	Rainfall amount, rainfall intensity & duration
6.	Frost	Minimum temperature, sunshine hours, wind speed
7.	Heat waves	Maximum temperature
8.	Cold waves	Minimum temperature
9.	Pest/Disease	Humidity, temperature

AWS/ARG Datasets are of immense use for improving crop loss estimation procedures under PMFBY and RWBCIS for the risks listed below:

a) Prevented / failed sowing / planting

b) On-Account payment of claims due to mid-season adversity

c) Localized Calamity

d) Post-Harvest Losses

e) Dispute resolution regarding Yield Data/Crop loss

f) Designing of Triggers and Term-Sheets

g) Technology based direct yield estimation

1.3. Scope of this manual

1.3.1. Documentation of the detailed protocols and guidelines for facilitating the establishment of AWS/ARG network under WINDS, which shall conform with the standards of IMD or National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited laboratories or equivalent, while taking into account the practical aspects and needs of agriculture sector, including Crop Insurance. In this manual the WINDS Committee has provided detailed guidelines covering the following aspects:

a. Roles and responsibilities of stakeholders implementing WINDS, and empanelment/selection criteria of WIPs and QAPs.

b. AWS/ARG siting requirements, sensor/instrument specifications, installation, calibration and maintenance protocols,

c. Protocols for integrating the data from already existing AWS/ARG network maintained by different Agencies/States/UTs

d. Protocols of data transmission, quality control/validation, storage, accessibility, setting up a central WINDS portal hosting and dissemination,

e. Data ownership and data and Information sharing policy

f. Financial Model for data procurement.

1.4. Major Components in WINDS Implementation

1.4.1. Automatic Weather Stations (AWS)/Automatic Rain Gauge (ARG)

1.4.1.1. An **Automatic Weather Station (AWS)** is an advanced meteorological instrument that automatically measure, record, and transmit weather data, such as precipitation, temperature, relative humidity, wind speed and direction, solar radiation, atmospheric pressure, etc., at a particular location and at regular pre-set intervals & transmits it automatically in real time. It is an assembly of various sensors to monitor weather parameters, coupled with a data logger and a communication device to record and transmit the weather data to a central WINDS PORTAL, where it may be stored, accessed and analysed.

1.4.1.2. An **Automatic Rain gauge (ARG)**, either independent or as part of an AWS, is an instrument used to collect and measure the amount of precipitation, specifically rainfall, at a particular location. The sensors may use various principles such as tipping buckets, weighing mechanisms, or optical methods to measure the amount of rainfall accurately. The collected data can be stored internally or transmitted wirelessly to a central database or weather monitoring system for analysis and further use.

1.4.2.   Existing AWS/ARG Network

Figure 1 depicts the current status of AWS/ARG network in India. This includes the current operational network of AWS/ARGs across different States/UTs.
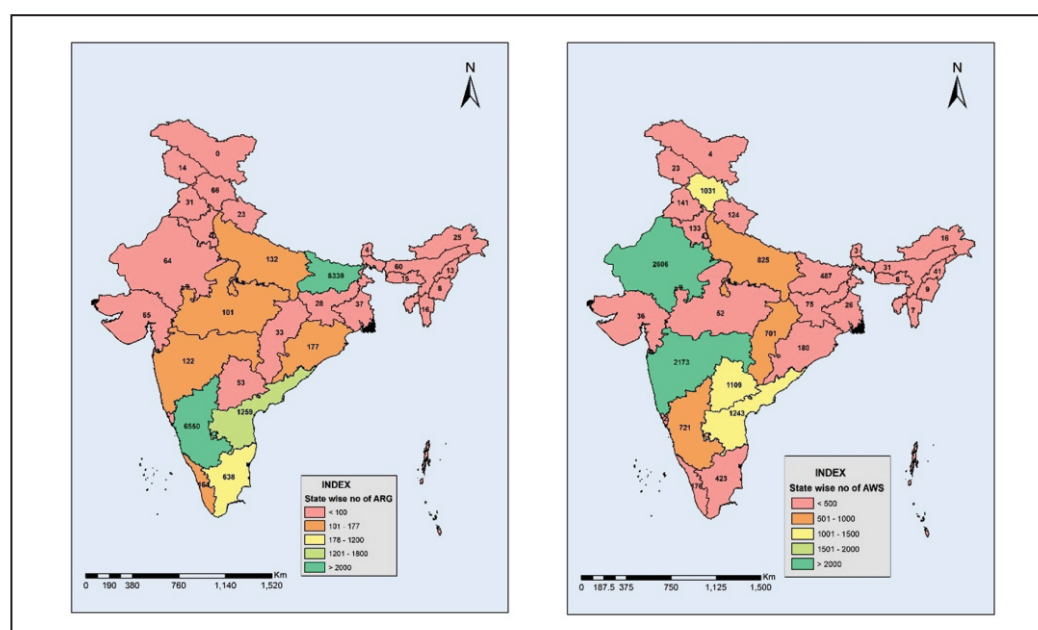
Figure 1: State wise status of Automatic Rain Gauges (ARGs) and Automatic Weather Stations (AWS) across India

*Source: Data collected/accessed from different states till May 2023

1.4.3.   Additional/Future Requirement

WINDS Committee has done an initial feasibility study to find out the status of the current operational network available with the States/UTs and IMD and the State/UT wise requirement of additional AWS and ARG at Reference Unit Area (RUA). The details of the same are provided in Annexure I. This was done to avoid duplication of efforts by different Central/State/UT Governments and for planning and selection of locations for installation of additional AWS/ARGs under WINDS.

1.4.4.   Quality Control & Quality Assessment

1.4.4.1. A robust quality control (QC) and quality assessment (QA) mechanism will be the backbone of the WINDS. Therefore, Quality Assurance Partners (QAPs) notified by GoI on

recommendation of the WINDS Committee shall undertake quality assessment of the AWS/ARG network and the resulting data as per the quality control and quality assessment protocols defined in this manual.

1.4.4.2. The quality assurance protocols and the implementation of the same will be challenging as the standard operating procedures (SOPs) for QC & QA of the weather network and data are not standardized in the country. It is expected that in years to come, this may become a niche market for third party accreditation of weather stations in India.

1.4.4.3. Therefore, going forward, the requirement will be a standard set of protocols and guidelines for accreditation of such networks. As of now it is the mandate of IMD to certify and accredit weather stations in the country and they are also part of the WINDS committee. Due to current limitations of IMD in terms of presence of accreditation laboratories across the country to manage the proposed network, it has been decided to onboard third party quality assurance partners (QAPs) for QC & QA of the proposed network.

1.4.4.4. DA&FW, GoI, shall select/engage the QAP for quality control and quality assurance.

1.4.4.5. DA&FW, GoI shall prepare detailed guidelines for selection/engagement of QAP.

1.4.5. **WINDS Portal**

The WINDS portal will be the nerve centre for hosting, managing, processing, storing and dissemination of large volumes of weather data recorded by the AWS/ARGs under WINDS. Functional aspects of WINDS portal are as follows:

1. **Data Ingestion:** The platform shall support the ingestion of weather data from AWS/ARGs under WINDS. It shall have the capability to handle real-time, near-real-time, and historical data.

2. **Data Storage and Management:** The platform shall provide scalable and reliable storage to accommodate the huge amount of weather data in near-real time mode. It should offer efficient data management techniques, including data organization, indexing, and compression, to optimize storage and retrieval operations.

3. **Data Processing and Analysis:** The platform shall support data processing capabilities, including data cleansing, quality control, interpolation, and aggregation. It shall facilitate various analytical operations, such as statistical analysis, trend detection, pattern recognition etc., to derive valuable insights from the weather data.

4. **Data Visualization and Reporting:** The platform shall offer visualization tools and interactive dashboards to present weather data in a user-friendly and intuitive manner. It shall support the generation of reports, charts, maps, and other graphical representations to facilitate data interpretation and communication.

5. **Data Access and APIs:** The platform shall provide secure access controls and APIs to enable authorized users to retrieve, query, and analyze weather data. It shall support standard data formats and protocols to ensure interoperability and facilitate integration with other systems or applications.

6. **Scalability and Performance:** A robust WINDS portal should be scalable to handle increasing data volumes and user demands. It shall be designed to deliver high-performance processing and storage capabilities to support real-time or near-real-time applications and analytics.

7. **Security and Privacy:** The platform shall incorporate robust security measures to protect sensitive weather data from unauthorized access, data breaches, and cyber threats. It shall adhere to data privacy regulations and industry best practices to ensure data confidentiality and integrity.

8. **Collaboration and Data Sharing:** The platform shall facilitate collaboration among weather agencies, Science & Technology institutions/agencies, and other stakeholders by providing mechanisms for data sharing, collaborative analytics, and collaborative workflows. It should offer features for data exchange, version control, and data access permissions.

1.5.   WINDS Establishment Plan / Realization framework

1.5.1. The proposed framework for realisation of WINDS is given in **Figure 3** below.
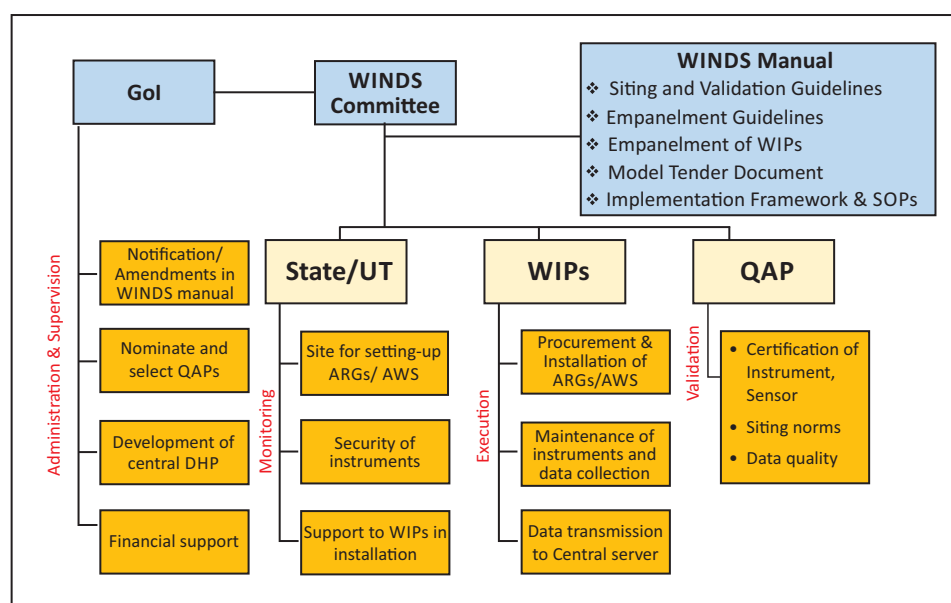
Figure 2: Realisation of WINDS

1.5.2. The purpose of WINDS is to facilitate the establishment of a full-fledged AWS at Block/Tehsil/Taluk level and ARG at Gram Panchayat (GP). There shall be no overlap between the AWS established at Block/Tehsil/Taluk level and the ARGs to be established at Gram Panchayat (GP) level.

1.6.   Existing Network Continuity Plan

1.6.1. There are three types of existing AWS/ARG networks available in the country at the time of launching of WINDS:

1.6.1.1. Institutional Networks: Networks established by GoI institutions like IMD, ICAR etc.

1.6.1.2. State Networks: Networks established by State/UT Governments such as Andhra Pradesh, Bihar, Himachal Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Telangana, Kerala etc. on their own through various schemes or funding mechanisms.

1.6.1.3. Private Networks for Crop Insurance: Networks established by private weather data providers under PMFBY/RWBCIS.

1.6.2.   Institutional Networks

Networks established by GoI institutions like IMD, ICAR etc. shall be integrated with WINDS, as per terms and conditions framed by WINDS Committee. Wherever any augmentation happens in such networks, it shall be made in compliance to WINDS standards and integrated with WINDS to avoid duplication.

1.6.3.   State Networks

1.6.3.1. The existing AWS/ARG network of the State/UTs and other authorized agencies, shall be integrated into WINDS, provided that the network, is a) fully operational, b) conforms with the minimum specifications as defined in this manual.

1.6.3.2. States/UTs can integrate their AWS/ARG network with WINDS anytime, however, funding

support shall be provided only if the State/UT is using the network under Centrally sponsored initiatives in Agriculture, Crop Insurance, Disaster Management or other sectors.

1.6.4. Private Networks for Crop Insurance

1.6.4.1. These networks have been established under the PMFBY/RWBCIS, mostly by charging the rental or establishment cost to the insurers operating under the said schemes. However, this has had the unintended consequence of loading the cost of running these networks onto the premium subsidy borne by the State/UT and Central Government. Needless to say, this increases the implementation burden on the State/UTs and makes the scheme unviable in the long run.

1.6.4.2. Therefore, it has been decided to delink this cost from WINDS and the same is proposed to be separately funded from FIAT (Fund for Innovation and Technology) established under PMFBY. However, as detailed above, the access to hyper local weather data is crucial for the crop insurance framework. Now that PMFBY tenders are being floated for the next 3-year tender cycle it is likely that there will be a discontinuity in the flow of this crucial data, as roll-out of WINDS may take time. This gap in weather data may also adversely impact YES-TECH activities.

1.6.4.3. Accordingly, to maintain the data continuity, as a stop gap arrangement, the existing arrangements of the State/UTs with the weather data service providers shall continue up to 6 months from the expiry of such Agreements, subject to approval of GoI on specific request of the State/UT, maximum up to 1 Year.

1.6.5. Existing weather networks, shall be eligible for reimbursement of data renting cost, subject to sharing of data on WINDS portal and compliance with the WINDS framework. The rental cost recommended by the WINDS Committee shall be based on the following factors:

1. National average of the renting cost discovered through bidding process under WINDS.

2. State/UT average of renting cost actually paid by the State/UT in the past under PMFBY/RWBCIS or any other Government scheme/initiative.

3. Rental rates charged by the respective State/UT Government or a body authorised to charge such rental by the State/UT Government.

4. Any other factor which may be relevant.

1.7. New Network

1.7.1. States/UTs shall map the existing AWS/ARG infrastructure in their respective State/UTs and additional requirements for setting up new AWS and ARG at Block/Taluka/Tehsil and Gram Panchayat (GP) level respectively, and inform the same to the WINDS Committee soon after the launch of WINDS by GoI.

1.7.2. The State/UT shall notify the Block/Taluka/Tehsil and Gram Panchayat (GP) for setting up of new AWS and ARGs respectively.

1.7.3. The new AWS/ARGs proposed to be established under WINDS shall not overlap with the existing functional AWS/ARG network, as well as the any future network proposed by IMD and State/UT Governments.

1.7.4. In case a new AWS/ARG is established by IMD or State/UT Government where WINDS is already being implemented by WIPs, data procurement from WIPs shall be withdrawn and data from IMD or State/UT Government AWS/ARG shall be transmitted to the WINDS Portal.

1.8. General Conditions

1.8.1. GoI shall facilitate the operationalization of AWS/ARG network under WINDS with private

player participation on the basis of **'renting of data'** i.e., final payment shall be linked to the data received at the WINDS portal, maintained by DA&FW. Data generated from AWS/ARGs under WINDS shall be directly sent to the WINDS portal as per the data and information sharing policy of WINDS.

1.8.2. The WIPs can explore the commercial potential of the weather data generated through AWS/ARG network installed and maintained by them under WINDS.

1.8.3. However, WIPs shall not provide any data to any entity specifically restrained by the GoI. Further, data of stations/area notified by IMD or any other Government body as classified, shall also not be shared by the WIPs. The same shall be described in the data and information sharing policy of WINDS, to be notified separately by the WINDS Committee.

1.8.4. The GoI and the State/UT Governments shall have the liberty to use the data generated under WINDS for public purposes, including but not limited to, implementation of welfare and development schemes, research and development works, developing weather advisory/agro-meteorological advisory, disaster management or for any other purpose involving larger public interest through Central/State/UT Government bodies or any other public institution including IMD, etc.

1.8.5. The WINDS data shared by GoI with any entity shall not be used for any other purpose or shared with any third party or monetized by such entities.

1.8.6. The weather data generated through AWS/ARG network under WINDS shall be hosted on an access-controlled WINDS portal and shall be shared with the concerned stakeholders, free of cost, as per the data and information sharing policy of WINDS, to be notified separately by the WINDS Committee.

2. **Stakeholders and their roles in WINDS implementation**

2.1. **DA&FW, Government of India (GoI)**

2.1.1. DA&FW shall notify the WINDS Committee.

2.1.2. The GoI, through the WINDS Committee, shall select Quality Assurance Partners (QAPs) as per the proposed "guidelines on selection and engagement of QAP" who shall undertake third party quality assessment of the AWS/ARG network and the resulting data as per the quality control and quality assessment protocols defined in this manual.

2.1.3. The GoI shall make necessary provisions for the development of a central WINDS Portal under the WINDS initiative for hosting and monitoring of the real time weather data gathered from different sources and for seamless flow of data and information. An integrated escalation mechanism for dispute resolution and a financial management tool for tracking of penalties and payments shall also be developed as part of the WINDS portal.

2.2. **WINDS Committee**

2.2.1. Overall execution and monitoring of WINDS.

2.2.2. The WINDS Committee shall empanel WIPs and QAPs, both private and government bodies, and notify the list from time to time.

2.2.3. WINDS committee shall lead the efforts for creating and implementing a robust framework of QC & QA mechanism for WINDS implementation and for on boarding of QAPs.

2.2.4. Periodical training and awareness program for stakeholders through National Agencies/ WIPs shall be organized under the guidance of WINDS Committee.

2.2.5. The WINDS committee shall devise a Monitoring and Evaluation (M&E) framework, containing key performance indicators, for the ranking of WIPs. This performance appraisal will be one of the criteria for the extension of the agreement.

2.2.6. The WINDS Committee, through MNCFC, may deploy its teams to randomly inspect the WINDS network.

2.2.7. Mahalanobis National Crop Forecast Centre (MNCFC) functions as the secretariat of the WINDS committee for taking care and disposing off the day-to-day matters for all WINDS related activities, on its behalf. The WINDS committee comprising at least two thirds of its strength shall meet for decision making on the following matters:

1. Recommend Changes/Revisions in WINDS manual.

2. De-empanelment of WINDS Implementation Partners (WIPs).

3. Dispute Resolution.

4. Fixing norms for paying cost to WIPs/QAPs.

5. Fixing norms for paying cost for Institutional Networks, State Networks and Private Networks.

6. Finalization of protocols for data flow between different stakeholders

7. Finalization of data and information sharing protocols.

8. Notification of Monitoring and Evaluation (M&E) framework

9. Any other matter referred by DA&FW, Government of India.

2.3. States/UTs

2.3.1. The State/UT shall float the WINDS tender for a tenure of five years, extendible for a period of further two years based on the performance evaluation of the WIPs as per the M&E framework to be notified by the WINDS Committee.

2.3.2. With the help of this manual, States/UTs shall select a WIP for facilitating the establishment of AWS/ARG network under WINDS from the list of agencies empanelled by the WINDS Committee.

2.3.3. The State/UTs who wish to integrate their existing AWS/ARG network with WINDS shall submit a detailed report as per the template provided in Annexure II, with the WINDS committee for evaluation.

2.3.4. States/UTs shall select a private agency as WIP through financial bidding process or a public entity through nomination as WIP as per their respective financial rules, from the list of agencies empanelled by WINDS Committee.

2.3.5. The State/UT shall identify and provide land/space for establishing AWS/ARGs under WINDS, by way of handing over possession of the said tract of land/space to the WIP. The list of Blocks/Tehsils/Gram Panchayats (GPs) shall be provided by the State/UT along with Latitude and Longitude details, as per their relevant rules. The same shall be uploaded on the WINDS portal, along with local contact person details (name, email and mobile) and integrated into the WINDS App. The siting verification and shall be through WINDS App only.

2.3.6. The State/UT shall handover the sites for establishing AWS/ARGs to the WIPs within One Month of the award of work.

2.3.7. The State/UT shall refer to the WINDS model tender document in SCETION 2.

2.3.8. There shall be no conflict of interest in the roles and responsibilities of the WIP and the QAP.

2.3.9. The State/UT shall notify the number of AWS to be established at Block/Tehsil/Taluk level and the number of ARGs to be installed at GP level, along with the names of such Block/Tehsil/Taluk and GP as per the format provided in Annexure III.

2.3.10. The State/UT shall notify the WINDS network as a source of certified weather data for settling claims under RWBCIS, for generating proxy indicators for applicable perils under PMFBY and for any other crop insurance schemes notified by the respective State/UT Government.

2.3.11. State/UT shall follow the procedure as defined in dispute resolution mechanism, if the WIP has not delivered the results or the State/UT is not satisfied with the deliverable/ methodology.

2.3.12. State/UT shall nominate an official of the concerned GP where the AWS/ARG is installed, as WINDS Local Guardian (WLG), for supervision of the site. The WLG shall be present at the time of installation, commissioning, calibration, maintenance etc. of the AWS/ARGs. The details of the WLGs shall be uploaded on the WINDS portal and OTP based authentication of the aforementioned activities by the WLGs shall be ensured.

2.3.13. The State/UT shall notify and publish the proposed AWS/ARG locations and name of concerned WLG, and a copy of the same shall necessarily be uploaded on the WINDS portal and also displayed in the concerned gram panchayat office for public information GP.

2.3.14. The State/UT shall sign a mandatory Agreement with the WIP selected by it for implementing WINDS.

2.4. Quality Assurance Partners (QAP)

2.4.1. As the scale of WINDS is huge, it is not possible to visualise all the challenges or issues in its implementation, including quality related aspects, at the time of framing of this manual. However, the need for a robust quality control and quality assessment (QC & QA) mechanism is well recognised and hence proposed to engage QAPs for such mechanism, for long-term functioning of WINDS.

2.4.2. Cost of QAP services will be recommended by the WINDS Committee to GoI.

2.4.3. The QAPs shall undertake third party quality assessment of the AWS/ARG network and the resulting data as per the QC & QA protocols defined in this manual.

2.4.4. QAPs shall use National Accreditation Board for Certification Bodies (NABCB) accredited certification/inspection bodies (if required) and follow a robust, mixed methodology for conducting third Party inspection and quality check of AWS/ARG siting, equipment and data transmission procedures through three stage assessment and verification process as mentioned below (Details in Annexure IV).

1. Existing Quality Assurance system followed by WIP,

2. On site inspections of AWS/ARGs,

3. Rigorous Data quality checks on flagged data alerts

2.4.5. The procedure for empanelment of 3rd party NABCB accredited agencies is provided in Annexure V.

2.4.6. The staff of NABCB accredited Inspection bodies will be deployed on-ground as assessors for the assessment of AWS/ARGs. A list of NABCB accredited bodies can be found at https://nabcb.qci.org.in/search-accredited-bodies/.

2.4.7. A list of NABL accredited calibration laboratories can be found at https://nabl-india.org/nabl/index.php?c=searchlab&m=index&Itemid=177. The WIPs can approach these NABL accredited laboratories directly for calibration of AWS/ARG sensors and other equipment. The process of accreditation of calibration laboratories by NABL is provided in Annexure VI.

2.4.8. QAP will assess WIPs quality assurance system for continually improving the delivery and effectiveness of AWS/ARG installation, operations, verifications, data transmission and

data integrity. This will be based on either the Quality Management System (QMS) outlined in the ISO 9001:2017 standards or the detailed description of the Quality Assurance System (QAS) being followed by the WIPs (Annexure IV).

2.4.9. The QAPs shall perform the audit/inspection using the WINDS app and submit the same on the WINDS portal on real time basis. Templates for audit/inspection are provided in Annexure IV.

2.4.10. The QAPs shall sign a Memorandum of Understanding (MoU) with MNCFC as per Annexure VII.

2.5. **WINDS Implementation Partners (WIPs)**

2.5.1. The empanelment of WIPs and their participation for implementation of WINDS shall imply their acceptance of all provisions, modalities and guidelines of WINDS.

2.5.2. The empanelled WIPs may participate in the financial bidding process of the State/UT Governments for implementing WINDS.

2.5.3. The empanelled WIPs selected by the State/UTs through financial bidding process for implementing WINDS shall have to deploy requisite infrastructure and resources for implementation of WINDS for the duration of the tender cycle.

2.5.4. The WIPs shall ensure an identical instance of data as available on WINDS portal on their own servers and there should not be any difference in data shared with any third-party vis a vis the data on the WINDS portal.

2.5.5. The WIP shall mandatorily establish a functional physical office in the State/UT at the State/UT headquarters or in a city mandated by the State/UT.

2.5.6. Installation of AWS/ARG setup and having the equipment verified from IMD or calibrated from NABL accredited laboratories or equivalent shall be the responsibility of the WIPs and an undertaking to that extent shall be submitted/uploaded on the WINDS portal.

2.5.7. Periodic calibration and maintenance of AWS/ARG sensors and equipment, either in-situ or in laboratory conditions shall be the responsibility of the WIPs.

2.5.8. The WIP shall setup and notify the reference standard AWS/ARG stations at district level and shall have adequate number of Travelling Standard kits for calibration of the sensors deployed.

2.5.9. The WIP shall ensure adequate physical infrastructure and manpower with requisite expertise and experience, at district level and below, as required for performing supervision, maintenance, calibration etc. of the AWS/ARGs, sensors and other equipment installed at the site.

2.5.10. The WIPs shall ensure that on reporting of fault, the response time shall not go beyond 24 hours.

2.5.11. The WIP shall have their own warehouse for storage of equipment and adequate spare parts and they shall be responsible for transportation and security of all the equipment and deliverables to the field location of AWS/ARG.

2.5.12. Site preparation and site security including all civil and other related works shall be the responsibility of the selected WIP.

2.5.13. The WIP shall ensure compliance of all laws/regulations/rules/guidelines including but not limited to Labour Laws.

2.5.14. The WIP shall establish and commission the AWS/ARGs at the locations provided by the State/UT within a period of three months from the date on which the site was handed over to them by the State/UT, as per the guidelines provided in Annexure VIII and Annexure IX.

2.5.15. The WIP shall upload the commissioning report as per Annexure X on the WINDS portal for each new AWS/ARG installed by them.

2.5.16. The WIP shall strictly follow the specifications for the installation of the sensors, electronics and other equipment, at the AWS/ARG location.

2.5.17. The WIP shall facilitate physical inspection or verification of any AWS/ARG installed under WINDS, by the concerned stakeholders or any person authorized by GoI, WINDS Committee or the State/UT Governments.

2.5.18. The WIP shall facilitate audit/inspection of the AWS/ARG site, sensors and equipment by the QAPs and provide necessary support for the same.

2.5.19. The WIP shall sign a mandatory Agreement with the State/UT for WINDS implementation.

2.5.20. The WIPs shall ensure that at least 90% of the AWS/ARGs installed and maintained by them under WINDS, are functioning and providing quality weather data without any errors, at any given point of time.

2.5.21. The WIPs shall submit system generated periodic status reports (online or physical) as per the defined timeline and through the desired channels.

2.5.22. The WIP shall participate in the review meeting with the State/UT and other stakeholders at regular intervals.

2.5.23. The WIPs shall ensure compliance with the data and information sharing policy notified by WINDS committee.

2.6.   Insurance Companies

2.6.1. The insurer may take part in regular meetings/workshops related to WINDS pertaining to their area of implementation.

2.6.2. The insurer shall not indulge in any unethical practices to influence the WIPs or QAPs

2.6.3. The insurer shall disclose any conflict of interest with the WIPs or QAPs in the implementing state.

2.6.4. The insurer shall check siting immediately pre-deployment and shall raise any objections regarding the same within 7 days of notification of the AWS/ARG location by the State/UTs.

2.6.5. Data access to the ICs shall be access controlled in their area of implementation only.

2.6.6. IC shall raise any dispute regarding the weather data within 7 days of reporting of data on the portal.

2.7.   Agreement between WIPs and State

2.7.1. The State/UT, and the WIP shall enter into an Agreement, for implementation of WINDS in the prescribed format.

2.7.2. The roles and responsibilities of the States/UTs, and the WIPs, as defined above and the provisions of payment terms, performance evaluation matrix, applicable penalties and service level agreement, shall be a part of the Agreement necessarily.

2.7.3. A template of the Agreement shall be shared separately by GoI with recommendation of the WINDS committee.

3.   Technical Details of Instrumentation & Siting

3.1.1. An Automatic weather station (AWS) shall have the following sensors as minimum requirement:

1. Tipping Bucket Rain Gauge Sensor

2. Air Temperature Sensor

3. Relative Humidity (RH) sensor

4. Wind Direction Sensor

5. Wind Speed Sensor

3.1.2. Approximately 10% of the total Automatic Rain Gauges (ARGs) to be established under WINDS, at Gram Panchayat (GP) level, shall have Temperature Sensors.

3.1.3. All the AWS under the WINDS network shall have a tilt sensor/clinometer installed as part of the mounting assembly/mast, which shall detect any shifts caused by strong winds, vibrations, or other factors that could impact the accuracy of the measurements. The tilt sensor shall generate automatic alerts on the WINDS Portal, if the measured tilt is more than the tolerance range of the sensor.

3.1.4. **Reference Weather Stations (RWS):** Based on distance and location and availability of AWS / ARGs, State/UT Governments in consultation with the WINDS committee shall compulsorily notify an AWS/ARG as Reference Weather Stations (RWS), for each Reference Unit Area (RUA) in their respective State/UT. The information regarding RUAs along with RWS stations shall be covered in notification issued by the State/UT at the commencement of the season.

3.1.5. **Backup Weather Stations (BWS):** In case an RWS is unable to provide data for any reason, Backup Weather Stations (BWS) shall be designated automatically based on the Nearest Neighbourhood Approach and/or correlation analysis subject to availability of historical data. The algorithm for selection of BWS shall be integrated into the WINDS system, and in case of missing data from an RWS, the same shall be filled using the identified BWS. Each RWS shall have two backup weather stations designated as BWS-1 and BWS-2.

3.1.6. If case of erroneous or missing data of AWS/ARGs, data recorded from BWS shall be considered final.

3.1.7. In case of multiple AWS at Block/Tehsil/Taluk level, the State/UT shall notify the location details where the AWS is to be installed and clearly define the service area of each AWS in the notification.

3.1.8. For ARGs installed at GP level, the State/UT shall notify the name of villages where the ARG is to be installed and the number and names of villages to be serviced by each ARG.

3.2. **AWS and ARG Sensor Specifications**

3.2.1. The Sensors shall be certified/calibrated by IMD or NABL accredited laboratories or equivalent.

3.2.2. All the sensors and equipment installed as part of AWS/ARG network under WINDS shall conform with the minimum specifications as described below.

3.2.3. **Automatic Rain Gauge**

Table 2: Automatic Rain Gauge Sensor Specifications

S No	Description	Required Specification
a	Instrument	Tipping Bucket Rain Gauge (TBRG)
b	Orifice Size/ collector diameter	Specified diameter of the collector rim shall be at least 159.5 mm
c	Collector Area	Specified collector area shall be at least 200 cm²
d	Reed Switch	Magnetic switch
e	Operating range	Unlimited; electrical impulse output
f	Response time	Capable of operating at rates up to 1 pulse per second.
g	Resolution	0.25 mm or 0.5 mm per tip
h	Output	Reed switch count
i	Sustainability	Up to 300 mm/hour
j	Accuracy: Maximum permissible % error in the measurement of rainfall	±2% or better, for rain rate up to 25 mm/hour
		±3% or better, for rain rate between 25mm/ hour to 50 mm/ hour
		±4% or better, for rain rate between 50mm/ hour to 100 mm/ hour
k	Range	Unlimited
l	Material of outer body /Housing (Base and collector)	Non-Corrosive material
m	Bucket Material	Injection molded non-hydroscopic ABS(Acrylonitrile Butadiene Styrene), UV-stabilized or brass with chrome plated or stainless steel
n	Levelling	Suitable levelling adjustment screws and circular spirit level must be provided at the base of TBRG for levelling the Tipping Bucket Mechanism.
o	Debris protection filter	Suitable (Wire mesh) debris protection filter should be provided inside the collector.

3.2.4. Air Temperature Sensor

Table 3: Air Temperature Sensor Specification

S No	Description	Required Specification
a	Type	PT100 1/3 class B or solid state or equivalent
b	Range	-20°C to 60°C
c	Resolution	0.1 °C
d	Accuracy (With Radiation shield)	±0.2 °C or better
e	Response time	< = 10 seconds
f	Out put	Digital
g	Louvered Radiation shield	UV Resistant (Minimum 6 Louvers)

3.2.5. Relative Humidity (RH) Sensor

Table 4: Relative Humidity (RH) Sensor Specifications

S No	Description	Required Specification
a	Type	Capacitive/Solid state sensor with protective coating
b	Range	0 to 100 % RH
c	Resolution	1 % RH
d	Accuracy (With Radiation shield)	±5% or better for RH 0 to 50%, ±3% or better for RH >50%
e	Response time	<=10 sec
f	Out put	Digital OR Analog
g	Louvered Radiation shield	UV Resistant (Minimum 6 Louvers)

3.2.6. Wind Speed and Wind Direction

Table 5: Wind Speed and Direction Sensor Specification

S No	Description	Required Specification
a	Type	Ultrasonic
b	Measurement Range (Wind Speed)	0-75 m/s
c	Measurement Range (Wind Direction)	$0\text{-}359^{0}$
d	Resolution (Wind Speed)	0.1 m/s
e	Resolution (Wind Direction)	1^{0}
f	Accuracy (Wind Speed)	±2% or better up to 50 m/s ±3% or better above 50 m/s
g	Accuracy (Wind Direction)	$\pm 3^{0}$
h	Response Time	Instantaneous
i	Output	Digital

3.3. Siting and Exposure - Conditions and Requirements

3.3.1. General Siting and Exposure conditions for AWS/ARG station

3.3.1.1. Standard Operating Procedure for AWS Installation/Deployment and guidelines for site preparation are described in Annexure VIII and Annexure IX shall be followed strictly, as siting and exposure have an important influence on the performance of the AWS/ARGs and the quality of the data generated.

3.3.1.2. Site for installation of the AWS/ARGs is to be provided by respective state governments, preferably government owned land/space, or if private land on rental basis, the rent for the same shall be borne by the state government. The site should be free from any encumbrance. It would be the responsibility of the State/UT Government to provide safe and secure sites for the installation.

3.3.1.3. The AWS is to be located on a level piece of ground, covered with short grass or natural earth ideally 5 m x 7 m in dimension. In cases of non-availability of space, 5 m x 5 m would be sufficient, especially in hilly areas.

3.3.1.4. Foundation should be laid for civil work at the site with RCC, for the mast, fencing and the equipment to be installed as part of the station.

3.3.1.5. The AWS/ARG site must be free from obstructions like tall buildings, trees, etc. The site shall be assessed for potential obstructions and potential sensor contaminants (e.g., water and dust sources) should be identified.

3.3.1.6. The site must be selected in a way that the distance between the fencing and the AWS/ARG mast should be at least 2 m. This distance is recommended to minimize the effect of the fence on the sensor's readings especially when weeds and/or debris on the fence act as horizontal obstruction.

3.3.1.7. Conditions to be avoided:

    a. Sheltered hollows, high vegetation, shaded areas, swamps, steep slope

    b. Obstructions like tall buildings, trees etc.

    c. Location of site on the edge of a slope, hillocks, cliff or inside a valley

    d. Large industrial heat sources

    e. Locations near high-tension power lines

    f. Low places holding standing water after rains

    g. Underground obstructions like buried cables or conduits

    h. Pollution influence from surrounding farms and towns

3.3.2. **Automatic Rain Gauge (ARG) – Tipping Bucket Rain Gauge (TBRG)**

3.3.2.1. The ARGs shall be located on a level piece of ground, covered with short grass or natural earth ideally 4 m x 3 m in dimension.

3.3.2.2. The ARGs shall be installed at minimum height of 30 cm from ground. However, in case suitable siting requirements are not met or in case of flood prone areas, the maximum height of such ARGs can be the rooftop of the one-story building.

3.3.2.3. In the event the ARGs are installed at rooftops, stable and proper foundation along with secure and tamper proof environment, shall be ensured.

3.3.2.4. The area surrounding the ARGs, at least up to 5 meters, should generally be flat and open, with slope of less than 30º.

3.3.2.5. Possible obstacles must be situated at a distance greater than the height of the obstacle.
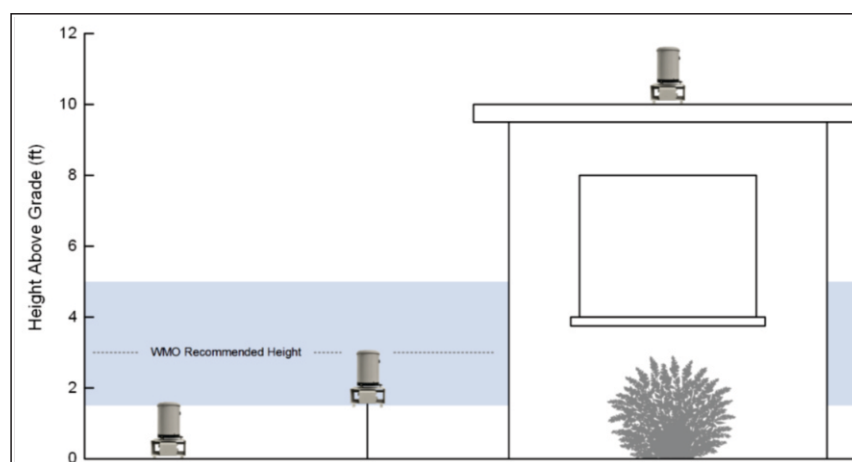
Figure 3: Most Common Rain Gauge Siting Criteria for height Above Grade
***(Source: Kevin L. Enfinger et al., ADS Environmental Services)**

3.3.3. Air Temperature and Relative Humidity (RH)

3.3.3.1. The standard measurement height of temperature and relative humidity sensors is 1.25 meter to 2 meters from the surface. The sensor must be enclosed in a radiation shield.

3.3.3.2. Ground covered with natural and low vegetation (<25 cm) representative of the region.

3.3.3.3. No irrigation or routine lawn watering system within 5m radius.

3.3.3.4. No significant heat source or reflective surface (buildings, roads, concrete surface) within 10m radius.

3.3.3.5. In case where 60 % of the RUA is covered by the water source or large-scale inland water, such locations shall be excluded from installation of AWS/ARGs.

3.3.3.6. Minimum distance from sensor to nearby other objects at least 1x the height of the object away.

3.3.4. Wind Speed and Wind Direction

3.3.4.1. The sensors shall be mounted on a mast at a height of 3 meters above the ground.

3.3.4.2. Surrounding obstacles must be at least 1.5 times their height away from wind mast.

3.3.4.3. Individual obstacles (i.e., shade, fence, short trees etc.), lower than 1.5 meters above ground can be ignored.

3.4. Data Acquisition and Transmission

3.4.1. Data Acquisition System (DAS) or Data Logger

3.4.1.1. A data acquisition system (DAS) or Data Logger is the heart & brain of the AWS station and shall provide a means to for collecting, logging and transmitting the weather data in a secure, reliable and efficient manner, while maintaining the availability, confidentiality and integrity of the data.

3.4.1.2. The data logger shall read data from a sensor, and store in an encrypted format, as per the Advanced Encryption Standard (AES) specification for the encryption of electronic data, for data security and to prevent unauthorized access to the data. The protocols for encryption & decryption of data are provided in Annexure XV.

3.4.1.3. It should have adequate number of analogue & digital channels and sufficient number of communication ports and shall be configurable and programmable remotely from the user end.

3.4.1.4. It must have open architecture to connect any commercially available sensor.

3.4.1.5. The software of the data logger shall be able to implement error handling mechanisms and remote updating to ensure the integrity of the data during collection, logging and transmission, and shall log any errors or exceptions.

3.4.1.6. Microcontroller/microprocessor-based technology shall be used for data acquisition or measurement.

3.4.1.7. Recording Timing: 08:30:01 am to 8:30:00 am (Todays data = starting from 08:30:01 am of previous day to 08:30:00 of measurement day).

3.4.1.8. Measurement of the weather parameters shall be conducted in the following manner:

Temperature : Continuous (one minute)

Humidity : Continuous (one minute)

Wind speed : Continuous (one minute)

Rainfall : Continuous

3.4.1.9. Data averaging period of the measurement shall be One Hour and the following parameters **(Table 6)** shall be recorded in the hourly summary:

Table 6 : Parameters to be recorded in hourly summary

Parameter	Description
Tavg	Average value of the temperature measured in one hour (average of 60 records)
Tmax	Maximum value of the temperature recorded in one hour (out of 60 records) It will be reported as per IMD Norms
Tmin	Minimum value of the temperature recorded in one hour (out of 60 records) It will be reported as per IMD Norms
RH	Average value of the relative humidity recorded in one hour (Average of 60 records)
Wind Speed	Average value of the wind speed recorded in one hour
Max W Speed	Maximum value of wind speed recorded in one hour
Min W Speed	Minimum value of wind speed recorded in one hour
Avg W Dir	Average value of the wind direction in one hour
Rainfall	Cumulative (Total) rainfall recorded in one hour (sum of all the records in one hour)

3.4.1.10. The following parameters shall be recorded in the daily summary:

Table 7: Parameters to be recorded in Daily Summary

Parameter	Description
Tmax	Maximum of maximum temperature recorded in one day (out of 24 records)
Tmin	Minimum of minimum temperature recorded in one day (out of 24 records)
RH at 08:30 am	Relative Humidity of 08:30 am/Relative Humidity (Morning)/RH-I
RH at 05:30 pm	Relative Humidity of 05:30 pm/Relative Humidity (Evening)/RH-II
Wind Speed	Average value of the wind speed recorded in one day (average of 24 records)
Max W Speed	Maximum value of wind speed recorded in one day (out of 24 records)
Min W Speed	Minimum value of wind speed recorded in one day (out of 24 records)
Avg W Dir	Average value of the wind direction recorded in one day (average of 24 records)
Rainfall	Cumulative (Total) rainfall recorded in one day (sum of 24 records).

3.4.1.11. The data logger software shall be able to provide status values indicating information about the state of the connected sensors. This indication shall include both analog sensors as well as sensor with digital serial interface. For each sensor, there shall be a value in the variable status, which can be included in the report(s) and or monitored in order to produce an alarm, e.g., for monitoring purposes. The manner how the status information will be presented shall be freely user definable in the setup software (e.g., good, suspicious, bad).

3.4.2. Data Transmission or Reporting

3.4.2.1. Mobile telemetry shall be used for the data transmission. Data logger should be compatible with 4G and above networks. It shall contain active dual sim cards for handling data communication redundancy.

3.4.2.2. The Data logger shall transmit the data directly to the WINDS portal which is owned and operated by DA&FW, GoI. Simultaneously, as a fallback, the same data as on WINDS portal shall be transmitted to server maintained by the service provider.

3.4.2.3. Data shall be transmitted on hourly basis i.e.; hourly summary of the data shall be transmitted to the WINDS portal.

3.4.2.4. For data completeness, 90% of the total AWS/ARGs in the network shall provide complete and error free data at any given time or day.

3.4.2.5. In addition to the parameters mentioned in **Tables 6 & 7**, the parameters viz, battery voltage, panel voltage, signal strength, IMEI number, time stamp, firmware version, device_id, latitude, longitude, shall be transmitted by the data logger to the server, in the form of a 'json' response.

3.4.2.6. JSON template for transmission of weather data from data logger to WINDS portal is as given below:

```
{
"Maximum_Temperature": 30.5,
"Minimum_Temperature": 15.2,
"Average_Temperature": 22.8,
"Maximum_Relative_Humidity": 90.1,
"Minimum_Relative_Humidity": 45.8,
"Average_Relative_Humidity": 68.2,
 "Average_Wind_Direction": "N",
"Maximum_Wind_Speed": 25.3,
"Average_Wind_Speed": 12.7,
"Rainfall_Hourly_Cumulative": 5.8,
"Rainfall_Daily Cumulative": 20.3,
"Rainfall_Weekly_Cumulative": 35.1,
"Maximum_Solar_Radiation": 1200.6,
"Minimum_Solar_Radiation": 300.2,
"Average_Solar_Radiation": 800.4,
"Atmospheric_Pressure": 1013.2,
"Average_Soil_Moisture": 45.6,
"Average_Soil_Temperature": 18.7,
"Sunshine_Duration": 6.2,
"Dew_Point_Temperature": 12.3,
"Battery_Voltage": 3.7,
"Panel_Voltage": 12.1,
"Signal_Strength": 80,
"IMEI_Number": "123456789012345",
"Device_id": "123456",
"Latitude": "22.771234",
"Longitude": "77.281234",
"Time_Stamp": "2023-04-18T15:30:00Z"
}
```

3.4.3. Power Requirements

3.4.3.1. The WIPs shall run the entire AWS/ARG network on solar and battery power. The system should be self-sustained, with fully solar power operated system with solar panels, battery bank and solar charge controller.

3.4.3.2. The battery must be maintenance free & it must be of such a capacity that the AWS/ARG shall run uninterrupted even in completely cloudy weather for at least 30 days.

3.4.3.3. The solar panel should be of adequate ratings to charge the battery during sun.

3.4.3.4. The Supplier must attach a detailed Power Budget Calculation taking care of solar panel and battery efficiency and sufficient safety factor of the system supported with documentary proof during technical empanelment for power consumption of the station for minimum 30 days on batteries without any charging.

3.4.3.5. The detailed power consumption of each component of the AWS/ARG system must be clearly mentioned in the technical brochures to support empanelment.

4. WINDS portal

4.1. For better synergies in the processes of data collection, reception, monitoring, storage, processing, quality control and dissemination, a National level WINDS portal shall be established at DA&FW, GoI. All the data generated through WINDS shall be hosted on this platform which will include the existing as well as all future networks of IMD, State/UT Governments and other agencies, and will be shared among the stakeholders freely as per the data and information sharing policy of WINDS.

4.2. A digital platform/app for uploading the details of maintenance, verification visits at the AWS/ARGs locations by QAPs, WIPs and other stakeholders is being developed by DA&FW, GoI and the same shall be integrated and made available on real-time basis on the WINDS portal. It will be mandatory for all stakeholders to use the digital platform/app without exception.

4.3. Specific hardware and software shall be added to the WINDS portal as required.

4.4. Specifications and architecture of WINDS portal along with corresponding user manual will be shared separately by the DA&FW, GoI.

4.5. 4.5. A metadata database, which shall provide detailed information necessary for users to gain adequate background knowledge about the AWS/ARG stations and observational data, together with updates due to changes that occur, shall be a part of the WINDS database. The major metadata elements include the following:

a) Station information,

b) Individual instrument information,

c) Data processing information,

d) Data handling information,

e) Data transmission information,

f) Quality check information

4.6. A general flowchart of the WINDS data flow through the WINDS portal is depicted in **Figure 4** below.

Workflow showing detailed steps for the data integration and dissemination
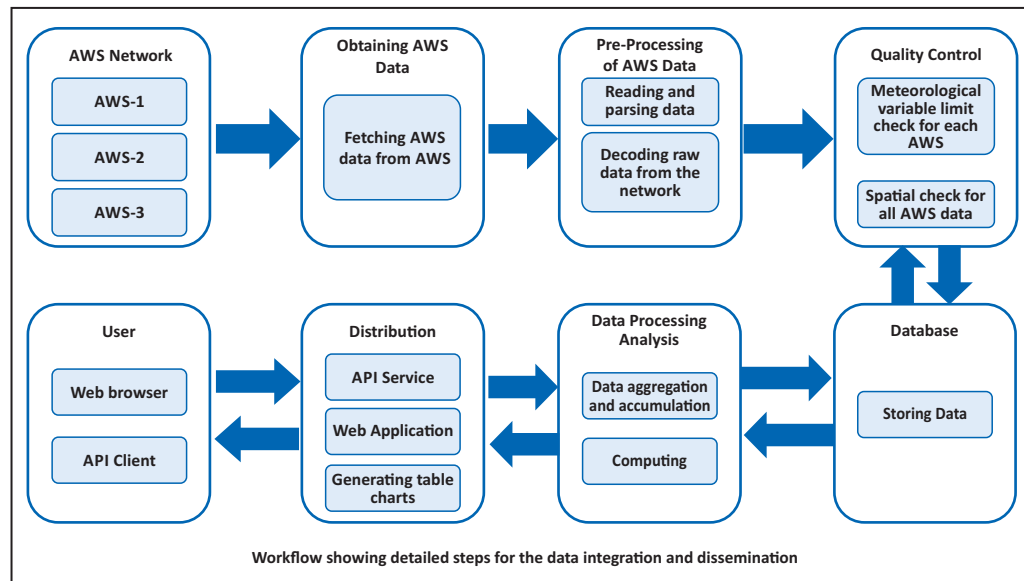
Figure 4: Data Flow through WINDS portal

4.7. Reports/Tools/Dashboard

4.7.1. **Status Reports:** There should be an automatic report generation tool to monitor on status of the AWS/ARGs installed under WINDS. The Report Tool should be embedded with WINDS portal, shall allow users to create Report summaries. The Reports can be generated in formats such as a delimited text file, Microsoft Word, Microsoft excel, PDF, etc.

4.7.2. **Visualization Tools/Dashboard:** The WINDS portal shall be supported with advanced visualization and data analysis tools to monitor and review the real-time and historical data on multiple levels and shall provide at-a-glance view of key weather indicators.

5. Accreditation, Calibration and Maintenance of AWS/ARG network

5.1. Accreditation

5.1.1. WIP shall be responsible for the accreditation of the Instruments and sensors of AWS/ARGs, through accredited labs of IMD or NABL accredited laboratories in the country, as per the sensor and instrument specifications defined in this manual, before commissioning of the AWS/ARGs under WINDS.

5.2. Calibration

5.2.1. AWS/ARG sensors with electrical components, along with signal conditioning modules and data-acquisition and transmission equipment, show accuracy drifts in time and, consequently, need regular inspection and calibration.

5.2.2. The calibration of the equipment may be done in-situ i.e., Field Inspection and/or under Laboratory conditions, by the WIPs at regular intervals and compulsorily be logged into the WINDS Portal.

5.2.3. The calibration interval is determined by the drift specifications given by the manufacturer and the required accuracy.

5.2.4. To maintain data quality, sensor calibration shall be performed by the WIPs as and when required and at least once in a year with travelling standards.

5.2.5. The periodic comparison of AWS/ARG sensors with travelling standards at the AWS/ARG location is an absolute requirement to monitor the performance of the sensors. Before and after field inspections, the travelling standards and reference sources must be compared with the working standards which has traceability to SI units through calibration from NABL/equivalent laboratory. The maintenance service must be informed as soon as possible when accuracy deviations are detected.

5.2.6. Instruments at the end of their calibration interval, instruments showing an accuracy deviation beyond allowed limits during a field inspection and instruments repaired by the maintenance service, should be returned to a calibration laboratory prior to re-use.

5.2.7. The detailed guidelines for calibration of AWS/ARG sensors and equipment are provided in Annexure XI.

5.3.   Maintenance

5.3.1. Periodic maintenance of the AWS/ARGs, under the WINDS network shall be the responsibility of the WIP.

5.3.2. The WIPs shall depute a service engineer and adequate service staff at the district level, for quick response and turnaround time.

5.3.3. Response time, for emergency maintenance shouldn't be more than 3 days, in any case. SLA shall be followed.

5.3.4. The WIPs shall follow the following maintenance checks:

5.3.4.1. Preventive Maintenance

Apart from regular field visits by the service engineers of WIPs, preventive maintenance shall be done once in a quarter. However, during the four monsoon months (June-September), preventive maintenance shall be done every month. To minimize corrective maintenance and to increase the performance of an AWS/ARG, well-organized preventive maintenance shall always be practiced.

5.3.4.2. Emergency/Corrective/Breakdown Maintenance/ Trouble Shooting

WIPs shall monitor the AWS/ARGs installed under WINDS and attend to any kind of breakdown or emergency, proactively or on intimation of the concerned stakeholders. Emergency/corrective/breakdown maintenance must be attended within 2 days from the day of fault/breakdown reported.

5.3.4.3. Adaptive Maintenance

Adaptive maintenance of AWS/ARGs by WIPs is required to take into account the rapid changes in technology and the availability of spare parts after a few years.

5.3.5. The WINDS portal should be capable of providing access to online maintenance logs on a web portal for the maintenance of AWS/ARG.

5.3.6. The Standard Operating Procedures (SOPs) for Maintenance of the AWS/ARGs under WINDS are provided in Annexure XII.

6.   Third Party QC & QA of AWS/ARG Network Data Verification

6.1. QAP shall conduct physical verification of randomly selected AWS/ARG stations at regular intervals at least once in a year, including the existing network of the States/UTs, other than IMD network, and shall upload the report on the WINDS portal through WINDS app.

6.2. QAP shall verify the AWS/ARGs as per the age of the AWS/ARG station as depicted in **Table 8** below:

Table 8: Proportion of AWS/ARGs to be verified as per the age of the station

S. No	Age Weather Station/Sensor	Proportion
1	Up to one Year	Minimum 10% of stations
2	Above One Year and up to two years	Minimum 15% of stations
3	Above Two Year and up to Three years	Minimum 20% of stations
4	Above Three Years	Minimum 25% of stations

6.3. Validation (Physical)

6.3.1. Physical verification/inspection/audit of the selected AWS/ARGs, including siting, sensors and other equipment, shall be done by the QAP at least once during the year and the same shall be facilitated by the WIPs and the State/UT Governments.

6.3.2. The detailed guidelines for inspection and audit of the AWS/ARG network under WINDS are provided in Annexure IV.

6.4. Data Validation

6.4.1. Automatic QC & QA algorithms shall be built in the WINDS portal. The access of QC failed data along with missing/erroneous data instances shall be provided to the QAP through the login/API services of the WINDS portal.

6.4.2. To maintain the quality and integrity of the huge amount of weather data being generated through the AWS/ARG network under WINDS, certain checks and validations shall be performed on the flagged QC failed data made available through WINDS portal and QAPs may initiate focussed additional inspections/audits of the such AWS/ARGs.

6.4.3. The various checks and tests which may be performed by WIP in their respective system and by MNCFC on the WINDS portal are:

6.4.3.1. Plausible Value Check

The aim of the test is to verify whether the values are within acceptable range limits depending on the climatic conditions of the measurement site and the season. The check provides information as to whether the values are erroneous or suspect.

6.4.3.2. Range test

The range test is based upon a combination of performance specifications for each sensor and the annual, seasonal and monthly climatic extremes. Each parameter has predetermined limits (Lookup tables). Any observation that occurs outside of the maximum or minimum allowable value is flagged as a "failure."

6.4.3.3. Step Test

The step test compares the change between successive observations. If the difference exceeds an allowed value, distinct for each parameter, the observation is flagged as a "warning." If either one of the data points used in the comparison are missing, the test indicates a null result for those pairs; other tests determine which data point is missing. (The step test has proven useful for detecting erroneous readings due to unsecured wires/cables or datalogger problems.)

6.4.3.4. Temporal Consistency/variability Check

a. The measured rate of change of a meteorological parameter is checked against a maximum physically acceptable temporal variability or against a maximum climatological plausible variability in a specified time interval.

b.   The measured rate of change between two consecutive measures is tested against a minimal required variability in a certain period.

6.4.3.5. Internal Consistency Test

a.   Under this check all tests of the consistency of the different parameters measured at the same site, as, for example, non-zero rain with relative humidity below a threshold value.

b.   Check number of data points, it should be 24 (always).

c.   Data points must be of 60 minutes' interval.

6.4.3.6. Persistence Test

The persistence test checks an entire day's data from a single station, one parameter at a time. The mean and standard deviation for that parameters are calculated. If standard deviation is below acceptable minimum, the corresponding data values are flagged as either "suspect" or "warning", depending upon the departure of the standard deviation from the minimum threshold (i.e., 3σ). The persistence test is useful for determining damaged/defective instruments or those "stuck" at a particular reading.

6.4.3.7. Spatial Consistency Check

In this test the data is checked and compared with the surrounding nearby automatic weather station's data. First, an outlier detection is performed on both the station data being quality checked and the data of the surrounding stations using the daily time series of each station. If an outlier is detected for the station being quality checked, then the data fails the spatial consistency test. Otherwise, entire data is tested on an hourly basis whether the analysed station value falls inside a confidence interval formed from surrounding stations data that were not classified as outliers. Measurements that fail the test are flagged as suspect or erroneous depending upon the departure of the data from the confidence interval.

6.4.4.   The details of the tests and checks to be performed and the algorithms/processes to be deployed in the WINDS Portal for data validation are described in Annexure XIII.

7.   Financial Implications

7.1.   Implementation of AWS/ARG network under WINDS at national level will involve cost considerations for the following components:

a)   Site selection, land cost/rentals, and preparation, maintenance and security of the site,

b)   Installation, calibration and maintenance of the AWS/ARG setup including sensors, electronics and other equipment,

c)   Setting up the WINDS portal, WINDS App, computational facilities and integration with external systems,

d)   Quality control and quality assurance, data monitoring and analysis, expert knowledge, etc.

e)   Rental Cost for procurement of weather data

7.2.   All the above inputs and factors will contribute towards the overall implementation cost of WINDS. Since, WINDS mechanism is limited to procurement of **weather data on rental basis,** DA&FW, GoI shall only contribute funds towards rental data cost.

7.3.   Accordingly, the contribution under WINDS shall be shared between Central and State Governments on sunset basis, for State/UTs implementing PMFBY/RWBCIS, as mentioned in **Table 9** below.

Table 9: Financial arrangement for implementing WINDS

S. No	Particulars	Sharing Ratio/Pattern between Central and State Governments for WINDS			
		2023-24 (1st year)	2024-25 (2nd year)	2025-26 (3rd year)	4th Year Onwards*
1	North-eastern and Himalayan States	90:10	90:10	90:10	90:10
2.	Other States	90:10	80:20	60:40	50:50

* Subject to Review and Approval

7.4. The States/UTs which are not implementing PMFBY/RWBCIS schemes but have their own operational network of AWS/ARGs and are using the data for other Central/State/UT sponsored schemes under NDMA, NDRF etc, can request funding support from other GoI departments or use their own State Disaster Relief Fund (SDRF) for operationalizing WINDS within the State/UT, provided the AWS/ARG network conforms with the protocols specified in this manual.

7.5. Payment to QAP

7.5.1. The cost of third-party verification and validation by QAPs shall be funded from FIAT established under PMFBY.

7.5.2. The cost of third-party audit and inspection by QAPs will involve the following components:

    1.   Audit/Inspection of AWS/ARGs (for ground visits)

    2.   Audit/Inspection of WIPs after reviewing their self-assessment

    3.   Travel Expenses to the AWS/ARG site

    4.   Infrastructure Cost - Computer Systems, Hardware, Dashboard

    5.   Manpower – Dedicated and floating resources

    6.   Training of Assessors

    7.   Project Management Cost

    8.   Other miscellaneous expenses,

7.5.3. MNCFC/WINDS Committee will examine the proposal submitted by QAP and the admissible cost of audit/inspection and other expenses, will be considered and sanctioned for the tender cycle.

7.5.4. The payment to QAP shall be paid on actual cost basis on submission of Bills/Invoice/Expenditure Statement etc. by the QAP at regular intervals.

8. Dispute resolution in WINDS – Timelines and Mechanisms

8.1. Since WINDS is being rolled out for the first time, it is not possible to visualise all disputes/issues at the time of framing of this manual. Accordingly, provision is being made to handle disputes of both types, viz. those which are anticipated and otherwise.

8.2. As WINDS is a national initiative with a broad range of applications, different stakeholders who may raise disputes under the WINDS are:

    a)   Any stakeholder using WINDS data for implementing Government sponsored programme/study or research in the State/UT, which may include:

        i.   State/UT Administration

ii.   Insurance companies implementing PMFBY & RWBCIS,

iii. MITRs, TIPs and WIPs,

b)   Any citizen of India, by intimation through Local Government Officer and/or the WLG.

8.3. A dispute may be raised by any of the above-mentioned stakeholders on the WINDS Portal or WINDS App, in case the protocols related to siting conditions of AWS/ARG, data recording and data transmission, maintenance etc., are not being adhered to.

8.4. Disputes, if any, related to WINDS implementation framework shall be handled by the concerned Nodal Department of the State/UT Government responsible for implementation of WINDS in the State/UT.

8.5.   Siting Disputes

8.5.1. The State/UT shall notify and publish proposed AWS/ARG locations and name of concerned WINDS Local Guardian (WLG) and a copy of the same shall necessarily be uploaded on the WINDS portal and also displayed in the concerned gram panchayat office for public information.

8.5.2. Any dispute related to location of the AWS/ARG shall be raised within 7 working days of notification of the AWS/ARG location by the State/UTs through the WINDS app/portal.

8.5.3. The siting location of AWS/ARG shall be deemed to be accepted by all the stakeholders if no objection is raised within 7 working days of such notification of AWS/ARG locations by State/UT.

8.6.   Data Quality Disputes

8.6.1. The data quality related disputes shall be resolved by adopting the standard quality control and quality assessment procedures as defined in this manual.

8.6.2. Any dispute related to data, shall be raised within 7 days of receipt of data on the WINDS portal, through the WINDS app/portal.

8.6.3. The AWS/ARG data on the WINDS portal shall be deemed to be accepted by all the stakeholders if no objection is raised on data within 7 working days of receipt of data on the WINDS portal.

8.7.   Escalation Mechanism

8.7.1. The escalation mechanism for dispute resolution shall be built into the WIND Portal/App and shall follow the following structure:

8.7.2. **Level 1:** The WIP's representative and the concerned Block level officer of the Nodal Department of the State/UT Government responsible for implementation of WINDS, shall review the complaint/objection and resolve the same withing 3 days.

8.7.3. **Level 2:** If any of the stakeholders are not satisfied with the Level 1 resolution, the matter shall be escalated to a District level committee comprising of the concerned District Level Officer of the Nodal Department of the State/UT Government responsible for implementation of WINDS and an agrometeorologist from any government institution (IMD, ICAR, KVKs, SAUs, etc), who shall review the objection raised and resolve the matter within 7 days of escalation, after verifying the AWS/ARG siting and/or data quality norms and shall notify the WIPs for taking corrective action with defined timelines not more than 7 days.

8.7.4. **Level 3:** Any issue which remains unresolved at level 2 of the escalation mechanism, shall be escalated to a State/UT level committee comprising of the authorized senior officer of the concerned nodal department of the State/UT, officer from IMD's Meteorological Centre's

head office in the State/UT or Regional Meteorological Centres (RMCs), who shall review the escalation and pass a speaking order on the matter within 7 days of the escalation.

8.7.5. **Level 4:** The WINDS Committee shall act as appellate authority in case any dispute between the stakeholders is not resolved at level 3 of the escalation mechanism. Its decisions shall be final and binding on all concerned. For this, the WINDS committee shall call for a meeting of all the concerned stakeholders and external experts, if necessary, within 7 working days of the date of receipt of appeal in which views of all the stakeholders shall be recorded. The WINDS Committee will hear the appeal and pass a speaking order within 15 days of the date of receipt of appeal, after hearing all the stakeholders' implementing WINDS.

8.7.6. In case, more than 10% of the total AWS/ARG locations in a district are affected due to siting or data quality issues, the WINDS committee can suo moto or on the recommendation of the State/UT or other stakeholders, can take cognizance of the matter and issue directions for resolution or serve a show cause notice or warning to the WIP.

8.8. **RWBCIS/PMFBY Related Disputes**

8.8.1. Any dispute pertaining to claim related or other issues under RWBCIS/PMFBY or other crop insurance schemes shall be referred to the appellate authorities mentioned under the corresponding scheme guidelines notified by the State/UTs and shall be resolved as per the dispute resolution mechanisms as per the relevant provisions of the operational guidelines of those schemes.

8.9. **General Provisions related to other disputes**

8.9.1. Data generated under WINDS shall not be compared with any other sources not notified by the WINDS committee.

8.9.2. Any dispute by the State/UT, WIP, insurer, or other stakeholders raised under the Dispute resolution mechanism of WINDS must be related to the technical aspects of WINDS implementation and not to the policy decisions.

8.9.3. Disputes, if any, related to WINDS implementation framework shall be handled by the Nodal Department of the State/UT Government responsible for implementation of WINDS.

9. **Empanelment of WINDS Implementation Partners (WIP)**

9.1. **Empanelment of WIP by WINDS Committee**

9.1.1. WINDS Committee shall technically empanel the WIPs through an open and transparent process of seeking expression of interest (EOI).

9.1.2. The agencies who have already implemented weather data related services for at least 3 Years in different states, and have installed and successfully operated more than 1000 AWS and/or ARGs cumulatively in the last three out of five years, will be considered for empanelment by the WINDS Committee as WIP.

9.1.3. The Private Sector and Central/State/UT technical organizations empanelled by WINDS Committee as WIP and selected by State/UT Government through financial bidding process/nomination shall implement WINDS.

9.1.4. Any Private Sector Company or Central/State/UT organization may submit their proposal to the WINDS committee in the prescribed format for technical empanelment as WIP.

9.2. **Criteria for Empanelment of WIP (Eligibility & Procedure)**

9.2.1. **Eligibility Criteria**

9.2.1.1. This work is open to all technical agencies, which include government, private, international, and autonomous organizations. However, International Agencies should have legal presence and registered entity in India with adequate capacity to work at field level.

9.2.1.2. The agencies must be having proper Manpower Resources i.e., Lead Experts, Agro-Meteorological Experts, Remote Sensing Experts, Statistics Experts, Agriculture Experts, Data Science & Modellers, and Software Developers on their pay rolls, minimum of 10-15 experts, for which documentary proof needs to be submitted.

9.2.1.3. They must have in-house capacity/resources/manpower (service engineer) for maintenance, calibration and troubleshooting of AWS/ARGs including the sensors and other equipment as per the protocols defined in this manual.

9.2.1.4. The agency must have well equipped data centre and lab for monitoring and analysis/modelling of weather data.

9.2.1.5. Preference shall be given to agencies who have demonstrated experience in implementing innovative weather-based solutions in agricultural applications, i.e., integrating weather data and derived products with remote sensing, AI/ML, IoT, and crop simulation tools etc and their approaches have been tested/used by the State/insurance companies/central government agencies/PSUs etc.

9.2.1.6. The Agency must not have been blacklisted/debarred by any Government or its bodies, nor should they have been debarred from dealing with any public entity in the past three years.

9.2.1.7. The Agency must be registered with all Government/statutory authorities, for not less than 5 years, such as ROC, GST, the Sales Tax Department, Income Tax Department, etc. as required in the normal course of business for providing similar services.

9.2.1.8. The agency should have a minimum annual turnover of 10 Crores in three out of last five years, specifically related to similar activities.

9.2.2. **Technical criteria for Empanelment of WIPs**

9.2.2.1. The agencies fulfilling the eligibility criteria shall only be considered for technical evaluation. The minimum qualifying mark will be 70 out of a maximum of 100 (hundred marks) as a benchmark for the quality of the technical proposal. The agencies qualifying the technical criteria shall be empanelled as WIP by the WINDS Committee. The various criteria based on which the technical proposal will be evaluated are given in Table 10 below.

Table 10: Marking Criteria for Technical Evaluation

Sr. No.	Parameter	Supporting Document	Maximum Marks	Marking Criteria
1.	**Weather Data as a Service:** Experience in Crop Insurance Sector or any other Central/State/UT Government scheme **(Minimum 3 Years)**	Details of Contracts relating to supplying of data to reputed Central/State Govt./Public sectors, attested copies of the work orders.	25 Marks	a) >= 3 Years & < 5 years: **12 Marks;** b) **>= 5 Years & < 8 years: 18 Marks;** c) >= 8 years: **25 Marks**
2.	The Bidder must have executed at least one similar project involving installation of 1000 AWS / ARGs cumulatively in the past 3 Years. **Substantially completed ongoing projects will also be considered.**	Client References: - 1. 2.. 3.	20 Marks	a) Similar projects (=1): **10 Marks;** b) Similar projects (= 2): **15 Marks;** c) Similar projects (3 or more): **20 Marks;**

Sr. No.	Parameter	Supporting Document	Maximum Marks	Marking Criteria
	Documentary Proofs such as contract order, client references & contact details (email/ landline/ mobile) of such client(s) for whom similar projects were executed (Start & End Date of the Project to be mentioned) shall be provided.			
3.	**No. of Subject matter Specialists/Technical Manpower** The agency should have inhouse meteorologists, service engineers, data science experts, software developers on their payroll	Documentary proof of qualification/ employment to be attached. (Agro-**Meteorological Experts** – Masters/ PhD in Atmospheric science / Meteorology/Agro-Meteorology **Remote Sensing Experts** - Masters/ PhD in Remote Sensing or GIS **Service Engineers** – BTech/MTech/ PhD in Electronic or Electrical Engineering **Data Science experts, and Software Developers** – MCA/ BTech/ MTech/PhD in CS/IT with minimum 5 year of experience.	15 Marks	**a)** 15 Experts – **5 Marks 1 Mark** for each additional resource
4.	**Business Turnover:** Minimum annual turnover of 10 Crores in three out of last five years, specifically related to similar activities.	Copy of the audited Balance Sheet and/ or Certificate of the Chartered Accountant for preceding three years.	15 Marks	Average of Annual turnover for considered three years will be considered and marks will be given as follows: a) >=10 Crores & < 12.5 Crores: **10 Marks; Additional 1 Mark** for each 50 Lacs increase in Average Turnover

Sr. No.	Parameter	Supporting Document	Maximum Marks	Marking Criteria
5.	**Technical capability** The agency should have proven track record of analyzing, visualizing and modeling of weather data/products through Portals/App/Dashboard	Documentary proof to be attached	5 Marks	a) Dashboard/ visualization platform - **Max 2 marks** b) Mobile App for monitoring/quality control - **Max 2 marks** c) Weather based use cases - **1 mark**.
6.	The Applicant should have experience of working in (AWS/ARG and data related activities) at least 4 States/UTs of India with Government/ PSU/Government Institutions/ Insurance Companies for Govt Subsidized Crop Insurance Schemes	Written, Certified documentation of all the QA procedures	10 Marks	4 States: **5 Marks, 1 Mark** for each additional State/UT
7.	Technical presentation		10 Marks	Interaction with agencies

9.2.3. Documents to be Submitted by the Agencies

The agencies shall submit the following documents along with their proposal for empanelment as WIP:

a) An Undertaking on the agency's letterhead along with requisite documentary proofs. The format of the undertaking is provided in .

b) Any other document required as per the EOI document.

10. General Conditions for Selection of WIP by the State

10.1. The State/UT shall select the WIP either through nomination from empanelled Central/State/UT Government's technical institutes, as per the prevailing financial rules, or by inviting financial bids from the empanelled agencies only through Least Cost System (LCS).

10.2. The expected average lifecycle of an AWS/ARG is approximately seven to eight years, therefore the tenure of the tender shall be for five years extendable by two more years, subject to meeting the minimum performance criteria (as per the M&E framework) to be notified by the WINDS Committee. This is to ensure optimum cost benefit ratio for investment into creation of WINDS network. This will also facilitate the WIP to build its capacity and credibility among the stakeholders and will enable a supportive and collaborative environment and service effectiveness.

10.3. Detailed Model Tender Document for WINDS financial bidding process shall be notified by DA&FW on the recommendation of WINDS Committee.

10.4. The model tender document shall consist of a basic scope of work, payment terms, milestone delivery timelines, infrastructure and resource requirements etc. and other terms which may be incorporated by the implementing State/UT as per the prevailing financial rules.

10.5. In order to have transparency, all the details mentioned in the WINDS Model Tender Document shall be made a part of the tendering process. No material modification in the

terms and conditions enumerated in the tender document shall be allowed post tendering.

10.6. Bidding shall be done through the mode as prescribed in the Financial Rules prevailing in the State/UT and work order may be released within 2 weeks of the opening of the financial bids.

10.7. All conditions proposed to be stipulated by State/UT Government should be incorporated in the bid document itself and no new condition materially amending the terms should be included in the Agreement. In case empanelled WIPs have any objection to any Tender condition which is in conflict with the guidelines in this manual, they can make a reference to the State Government within 3 days of issuance of Tender.

10.8. State shall follow its due process including financial rules, general rules etc., while floating the tender.

10.9. The State/UT will validate the necessary documents as mentioned in the Model Tender Document, before opening the financial bid.

10.10. The rate at which real time weather data per AWS/ARG per month is sold by the WIP to GoI will be the parameter for evaluating the financial bids.

10.11. Once the process is over, State/UT will issue a notification of award/ work order to the L1 Bidder followed by an Agreement and the same shall be informed to the WINDS Secretariat.

11. Payment to WIP – Terms and Conditions

11.1. Payment to the WIPs shall be calculated and disbursed based on the price discovered through financial bidding process for rental cost of Weather data under WINDS across the State/UTs.

11.2. The payment to WIPs shall be made as per the SOP to be notified by DA&FW, GoI.

11.3. 1st Instalment – Advance

11.3.1. Since the cost of manufacturing, importing, installation of AWS/ARGs is very high, the fund requirement for WIPs at the commissioning stage is high and therefore WIPs need to ensure adequate funds and capacity to invest beforehand and also ensure uninterrupted installation and execution of project as per the timelines defined in the manual.

11.3.2. Accordingly, advance/mobilization charges of 20% of the procurement cost of weather data for five-year tender cycle shall be paid upfront to the implementing WIPs within 15 working days of the award of the work order subject to fulfilment of relevant provisions of the financial rules of the State/UT.

11.3.3. Advance payment shall be made against the Bank Guarantee (BG) of requisite amount valid for 6 months more than the Agreement period, to be submitted by the WIPs at the time of signing of Agreement.

11.3.4. WIPs shall be liable to start commissioning of AWS/ARGs only after the receipt of the 1st instalment or advance payment.

11.4. Subsequent Instalments - Quarterly

11.4.1. The roll-out/commissioning of AWS/ARGs will take two quarters, so further payments to WIPs shall be made on quarterly basis, from the 3rd Quarter onwards, against the invoices raised by the WIPs based on the quality-verified data as per WINDS portal. The advance paid in the first tranche will be amortized across 18 equal installments which will be adjusted from the quarterly invoice at the time of payment.

11.4.2. The WIPs shall raise the request for payment on the WINDS portal which shall be verified and approved by the respective State/UT and released by the agency/CNA authorized by GoI as per the notified SOP.

11.4.3. Payment invoices shall be subject to validation against the data received and quality verified

on WINDS portal as per the specification mentioned in this manual and fulfilment of other obligations stipulated in the Agreement.

12.   Performance Evaluation of WIPs

12.1.   The performance of the WIPs shall be closely monitored by the concerned department of the State/UT Government.

12.2.   For this purpose, a detailed Monitoring and Evaluation (M&E) framework for the ranking of WIPs, containing key performance indicators with assigned weightage, will be devised and shared separately by the WINDS Committee.

12.3.   Penalty Provisions

12.3.1.   Selected WIPs shall comply with the guidelines in this manual and the instructions issued by the Government from time to time. Non-compliance to guidelines shall attract penalty.

12.3.2.   Penalty will be imposed on the WIPs based upon the Service Level Agreement (SLA) indicators of compliance to specifications, timelines and data quality.

12.4.   Service Level Agreements (SLA)

12.4.1.   Delay in commissioning of AWS/ARG from stipulated timelines

The liquidated damage shall be 0.5% of procurement cost of weather data for the agreement period for delayed commissioning of AWS/ARG per week or part thereof, on pro-rata basis. The maximum amount of liquidated damages shall be 10% of the procurement cost of weather data for the agreement period.

12.4.2.   Missing/Erroneous Weather Data

12.4.2.1.   Missing of any of the weather parameters in a given day for a given AWS/ARG station shall be considered as erroneous data and no rental cost for such AWS/ARGs for the day shall be payable.

12.4.2.2.   A penalty upon per day data rental cost of AWS and ARG respectively shall be levied for each day of erroneous/missing data irrespective of number of weather parameters. Thereafter, the penalty shall increase gradually with each day of continuous erroneous/missing data.

12.4.2.3.   However mobile data network failure due to unforeseen circumstances, such as natural calamities, vandalization, etc., will be excluded, case wise on merits of situation while calculating the period of failure.

12.4.2.4.   The penalty shall be calculated on the basis of the yearly rental cost of the AWS and ARG station data as per the table below:

Table 11 : Penalty Calculation

S No	No. of Days or part thereof beyond Timeline	Penalty (Percentage of Yearly rental cost of the AWS and ARG station data
1	Up to 3 Days	0.00%
2	4	0.50%
3	5	0.50%
4	6	0.50%
5	7	1.00%
6	8	1.50%
7	9 and more	2.00%

12.4.2.5. Maximum penalty per station shall be up to 10% of the annual charges.

12.4.2.6. Penalty amount shall be adjusted against the invoice submitted at quarterly intervals by the WIP.

12.5. **Damages**

Notwithstanding anything contained in this manual, the WINDS Committee and/or the State/UT reserves the right to recover damages, without prejudice and in addition to the right mentioned under this Manual or remedies available under law, incurred as a result of claims arising due to misuse of any information or data acquired during implementation of WINDS and/or the Agreement or inaccurate or incorrect data provided by WIP or breach of any confidential information, wilful gross negligence, breach of indemnity clause, wilful misconduct etc. Such right to recover damages shall be without limitation of any liability.

13. **Termination, De-empanelment and Blacklisting**

13.1. **Termination of Agreement**

13.1.1. Either party shall be entitled to terminate the Agreement under specific situations and conditions as mentioned below, with an advance notice of ninety (90) days. The special conditions that invite termination of Agreement are as follows:

a) In case, the WIP is debarred/black-listed/de-empanelled by the WINDS committee.

b) Failure of the State/UT and/or the WIP in performing their core responsibilities as prescribed in this manual.

c) Any material changes in the WINDS parameters as listed in the empanelment criteria of WIPs and their roles and responsibilities, by the Centre/State/UT.

d) In case liquidated damages imposed on the WIPS exceed the limit of 10% of the procurement cost of weather data for the agreement period, as mentioned in clause 12.4.1. of this manual.

e) If it is found that more than 10% of the AWS/ARGs in the network, installed and maintained by the WIPs, are not functioning properly or are not providing quality data as per the norms, for more than One Month, the State/UT Government may de-notify the AWS/ARG network of part thereof.

f) Termination proceedings shall be initiated if the malfunctioning AWS/ARG network or part thereof as de-notified by the State/UT are not installed within 15 days of such notification.

g) Upon termination of Agreement, the WIP shall hand over peaceful possession of the premises / site to the State/UT Government except the AWS/ARG's machinery with all related accessories. However, fencing, foundation / brick masonry works, sign boards, tower for mounting instruments, lightening arrestor and miscellaneous accessories / assets etc. shall remain at site.

13.1.2. Termination of Agreement by either party due to any reason not listed above shall be taken up by the concerned State/UT govt. with the approval of competent authority, as per their respective financial rules.

13.2. **De-empanelment of WIP**

13.2.1. The WINDS Committee may review the WIP for de-empanelment suo-moto.

13.2.2. The WINDS Committee may also review WIP for de-empanelment on the recommendation of the concerned State/UT if:

13.2.2.1. The agreement has been terminated as per the Termination of Agreement clause.

13.2.2.2. If the malfunctioning AWS/ARG network or part thereof as de-notified by the State/UT is not installed within 15 days of such notification.

13.2.3. Before passing any order under these provisions, the WINDS Committee shall give an opportunity of being heard to the concerned WIP.

13.3. **Blacklisting**

13.3.1. The WINDS Committee may blacklist, if required, the de-empanelled WIP for a period of up to three years, after giving the WIP an opportunity of being heard.

14. **General Implementation Clause**

14.1. Henceforth, any changes in WINDS manual, shall be notified by DA&FW as addendums/amendment/appendices to this document and shall be binding on all stakeholders implementing WINDS, without any prejudice.

14.2. The power to modify, amend, withdraw, interpret any of the clauses in this manual shall solely vest in DA&FW, GoI. During the course of implementation, DA&FW may issue directives/advisories/notifications related to effective implementation of WINDS framework.

14.3. DA&FW, GoI at any time, may issue amendments/clarifications to any provisions in this manual or withdraw the manual, suo moto or on the reference of the WINDS committee.

S No	State/UT	District	Tehsil	Block / Mandal/ Hobli	Gram Panchayat	Existing Network		Required Network	
						IMD ARG	IMD AWS	ARG	AWS
1	Andaman and Nicobar Islands	3	9	9	70		1	70	8
2	Andhra Pradesh	26	679	668	13,325	1259	1243	12,066	0
3	Arunachal Pradesh	25	209	114	2,108	25	16	2,083	193
4	Assam	35	157	230	2,197	57	34	2,140	196
5	Bihar	38	534	534	8,174	8339	487	0	47
6	Chhattisgarh	33	220	146	11,656	33	26	11,623	194
7	Daman and Diu	3	3	3	38	1	2	37	1
8	Delhi	11	33			1	11	0	22
9	Goa	2	12	12	191	5	4	186	8
10	Gujrat	33	270	250	14,372	65	36	14,307	234
11	Haryana	22	143	143	6,220	33	32	6,187	111
12	Himachal Pradesh	12	190	99	3,615	66	26	3,549	164
13	Jammu & Kashmir	20	208	287	4,290	14	27	4,276	260
14	Jharkhand	24	264	264	4,345	28	75	4,317	189
15	Karnataka	31	236	234	5,958	6550	935	0	0
16	Kerala	14	78	152	941	30	109	911	43
17	Ladakh	2	15	31	193			193	31
18	Lakshadweep	1	10	10	10			10	10
19	Madhya Pradesh	52	424	313	23,066	101	66	22,965	358
20	Maharashtra	36	358	352	27,893	122	2173	27,771	0
21	Manipur	16	65	70	161	8	22	153	48
22	Meghalaya	12	46	46	708	15	12	693	34
23	Mizoram	11	26	26		16	7	0	19
24	Nagaland	15	120	74		13	41	0	79
25	Odisha	30	476	314	6,794	170	42	6,624	434
26	Puducherry	4	8	6	108	1	3	107	5

S No	State/UT	District	Tehsil	Block / Mandal/ Hobli	Gram Panchayat	Existing Network		Required Network	
						IMD ARG	IMD AWS	ARG	AWS
27	Punjab	23	97	153	13,241	31	141	13,210	12
28	Rajasthan	33	392	353	11,265	64	48	11,201	344
29	Sikkim	6	18	33	198	4	7	194	26
30	Tamil Nadu	38	313	388	12,525	79	47	12,446	341
31	Telangana	33	594	594	12,769	53	1109	12,716	0
32	Tripura	8	23	58	591	14	10	577	48
33	Uttarakhand	13	128	95	7,801	22	28	7,779	100
34	Uttar Pradesh	75	352	826	58,189	132	68	58,057	758
35	West Bengal	23	346	345	3,339	37	26	3,302	320

WINDS Template: Information's required from States/Agencies having already existing network of AWS/ ARGs

State/ Public Private agencies shall provide the information contained in the following table to review the status of existing ARGs/AWS network across the states. If the installed network is not complying the given criteria shall not be included in WINDS system.

S No.	State	District	Station	Pincode	Lat	Long	Altitude	Project	Aws/ Arg	Working Status	Measure-ment Interval
								(Supplier)			Frequency For Data Acquisition
1	2	3	4	5	6	7	8	9	10	11	12
1	Maharashtra	Mumbai	Bandra	400074	19.3N	72.49 E	7 Meter	IMD	AWS	Working	15 min

Communication (GPRS/Satellite/Dual)	Sensors				Soil Sensors		Solar Radiation Sensors	Any Other Sensors	Height Of Mast	Location Of Aws/Arg	Photograph Of Aws/ Arg Site	Remarks
	AT/ RH	TBRG	PRESSURE	WIND	SOIL MOISTURE	SOIL TEMP	(Thermo pile /Photo Diode)			(Ground/ Roof Top of Building)		
13	14	15	16	17	18	19	20	21	22	23	24	25
GPRS	Y	Y	Y	Y	(DEPTH)	(DEPTH)	N	N	10 M	GROUND		OK

Format for notifying List of AWS/ARGs under WINDS by the State/UT

S. No	State/ Union Territory	Block/ Tehsil/ Taluk	Gram Panchayat	Village	Name of WLG	Station Type (AWS/ ARG)	Station Status (New/ Old)	Date of Commissioning DD/MM/YYYY	Latitude (Degree Decimal, 5 decimal places)	Longitude (Degree Decimal, 5 decimal places)
1.										
2.										
3.										
4.										
5.										
6.										
7.										
.										
.										

3rd Party Inspection and Audit of AWS/ARG Network and Data by QAPs

1.   Validation of instrument, sensor, siting and data parameters

1.1.   Desktop Analysis and Ground Visits

QAP will assess WIP quality assurance system for continually improving the delivery and effectiveness of AWS/ARG installation, operations, verifications, data transmission and data integrity. This will be based on either the Quality Management System (QMS) outlined in the ISO 9001:2017 standards or the detailed description of the Quality Assurance System (QAS).

Prior to conducting any onsite assessment, QAP will require a self-assessment and commissioning report to be submitted. This report must be signed by the competent authority. Once a satisfactory desktop assessment is completed, the site assessment will be scheduled and communicated to the relevant parties at least one day in advance.

The QMS/QAS procedures of WIPs should have the following procedures:

1.1.1.   Documentation Required: (indicative list)

    a)   Organisation Structure and Leadership

    b)   Role and Responsibilities

    c)   Standard Operating Procedures (SOP) of activities

    d)   Human Resource Recruitment, training and periodical Evaluation

1.1.2.   Infrastructure required to complete the work (indicative list)

    a)   Office, Store Facilities, Training Facilities

    b)   Testing Facilities

    c)   Calibrations Equipment

    d)   Spare Parts

1.1.3.   Logistics requirement

    a)   As per geo-locations specifications defined by respective agenci

1.1.4.   AWS commissioning and Operational Team

    a)   As per geo-locations specifications defined by respective agencies

1.1.5.   Procedures (indicative list) for internal QMS

    a)   Define Leadership & Team: District wise / Region / Head Office

    b)   Define Role and Responsibilities.

    c)   Internal Auditing procedures

    d)   Risk identification & mitigation procedures.

    e)   Complaints handling & root cause Analysis

    f)   Corrective Action (CA) & Preventive Action (PA), Planned Do Act and Check (PDCA) cycle

    g)   Self-assessment and review of all SOP & activities in a month/6 month

1.1.6.   Indictive list of SOPs is mentioned below:

- Human resource recruitment / Tie ups, Training and evaluation.

- Procurement of materials & Quality Check and Calibration. To cross check the all documents, standards, materials data sheets, installation /Chips/Sensors requirements.

- Material transfer & storage requirements. (do's and don'ts)

- Site selection, documentation and drawings.

- Installation & verification of 1st 10 sets of data transmitted.

- Calibration of instruments. Defining the periodicity, cross checking records by handheld instruments to cross check the readings displayed at the AWS/ARG canters.

- Preventive maintenance and its log book

- Regular maintenance / replacement of chip/sensors recording each repair and replacement record and disposal SOP

- Obsolete sensors and discarded materials

- Data collection, Verification, QC check, Data transfer after due diligence & Authorised report to QC

1.2. Research Tool development

Based on the weather stations monitoring guidelines, a process map describing the 'should be' functioning of the AWS/ARG shall be developed. The minimum threshold parameters will be identified to imbibe the regional practices of states and options will be provided to gauge the verification and working conditions of AWS/ARG.

1.3. Training and Deployment of Assessors

For the purpose of assessment, Quality Council of India will use accredited agencies and their staff. The staff of NABCB Accredited Inspection bodies will be deployed on-ground as assessors for the assessment of Automatic Weather Stations (AWS). The assessors will be rigorously trained and tested for the selection. A continuous review of their performance shall be carried out for maintaining the optimum quality of data.

1.4. Technology for Data Collection and Quality Monitoring

A cloud-enabled mobile application will be used to collect the data and photographic
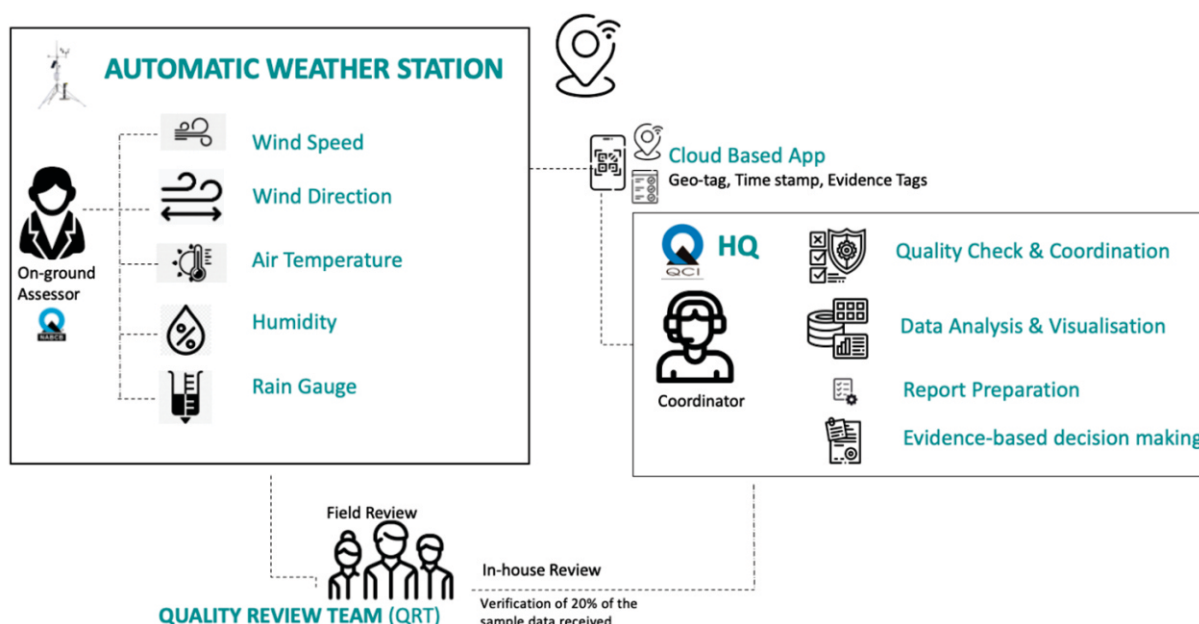
2. MONITORING AND QUALITY CONTROL

The regular monitoring of the ground team shall be conducted that shall help align with the expected outcomes of the verification study. Two layers of Quality Control is proposed to ensure quality and eliminate malpractices:

a) Quality Check of site verification: Every assessor, even after receiving thorough training, will undergo daily online monitoring by a QRT located in the QAP office. The verification of assessment and its data shall be fed into an application. 10% of the sample data received through calls will be verified with the SOP guidelines to ensure that the satisfactory level of quality is being maintained.

b) Quality Review Team: The Quality Review Team (QRT) shall review the verification data collection and operations as mentioned below.

3. Site Assessment & Verification

3.1. Data required from Agency before planning of site visit

a) Geo-location of AWS/ARG/sites to visit

b) Signed Site survey report, and installation report as per WINDS manual.

c) AWS/ARG instrument records such as unique ID of Data Loggers/Sensors, software, hardware, mechanical and electrical accessories including solar panel & batteries.

d) Installation & validation - site commissioning report by a competent and authorized person of the WIPs.

e) Site Acceptance Test Certificate (SAT), Factory Acceptance Test Certificate (FAT) {as per Annexure-I} & Batch Calibration Report

f) Preventive, Corrective & Adaptive Maintenance and calibration records/data chart (Annexure-II)

g) Educational and skill certification of human resource deployed at AWS/ARG stations (state/district coordinator, site supervisor)

3.2. Planning for On-site visit

a) On the basis of satisfactory completion and self-assessment report by AWS/ARG agency, QAP will plan a site visit.

b) QAP will inform the HQ/state coordinator only one-day prior to the visit and no excuse will be entertained regarding change in visit date/plan unless until there will be exceptional circumstances which will be defined on award of contract

c) QAP professional/ team will reach directly at site

d) Onsite Assessment of AWS/ARG stations after getting commissioning report

3.3. Site visit for 3rd party verification

a) During 3rd party independent verification, QAP will verify the proper siting/fencing/working of AWS/ARG stations and data recorded/transmitted during inspection.

b) Capability assessment (in terms of knowledge and awareness) of on-site man-power deployed by WIPs for installation/deployment and maintenance of AWS/ARG stations as per annexures I & II.

4. Data verification & Validation

4.1. Data required

a) Real time viewing access of WINDS Portal

b) Real time access to alerts/flags being generated on the WINDS portal

c) Site commissioning report with on-boarding intimation

d) Regular maintenance/ calibration records

e) Pre-intimation regarding maintenance and breakdown of AWS/ARG stations with approximate maintenance timing.

4.2. QAP's intervention during 3rd party verification

QAP will establish a central monitoring hub at its office in New Delhi for comprehensive oversight and monitoring purposes

a) Desktop Assessment: QAP will develop & deploy an algorithm for quality check of data gathered from all AWS/ARG centres as per the WINDS manual.

b) Alert System: Real time alert system will be implanted by WINDS portal for wrong & missing data, and respectively alert through system generated SMS will be notified to concerned person/agencies. Flagged data will be marked to QAP

c) Manual Verification post Algorithmic Quality Check: Certain risk based (based on discussion with WINDS committee) % of data / ARG/AWS from each state will be verified manually to authenticate the data gathered on the WINDS Portal.

d) Once QAP has found some discrepancy during a visit and was rectified initially, then any reassessment charges in case of recurring malfunctions at the same location - the cost of the 2nd - 3rd visit should be recovered from the concerned WIPs.

5. Guidelines for audit

- Siting, Exposure and Installation conditions of ARG/AWS and sensors

- Sensors Specifications

- Data recording, transmission and Reception

- Metadata

- Protocols and standards for maintenance, inspection and calibration

5.1. Inspection/Audit Report of AWS/ARG – Siting and Exposure

The repot of inspection/audit of AWS consist of following points:

5.1.1. Automatic weather station general siting considerations

The general principle is that a station should provide measurements of weather parameters of the site that are, and will remain representative of the surrounding area for PMFBY/RWBCIS

5.1.2. Exposure conditions for sensors

The general exposure conditions & installation as per the recommendations, for Wind speed and direction, Air temperature and Relative Humidity, Rainfall, are checked during the inspection, and as per the WINDS protocol.

5.1.3. Enclosure

The approach of the site, the enclosure, animal approach is checked during the inspection.

5.1.4. Tower Foundation

The condition of RCC foundation of the AWS mast is checked during the inspection.

5.1.5. Rain Gauge foundation

The condition of RCC foundation of the rain-gauge foundation is checked during the inspection.

5.1.6. Local Earth points

Earth point (earthing standards) to protect the AWS from the electrical surges, lightning induced transients is checked during the inspection.

5.1.7. Painting

AWS mast and its accessories are painted periodically is checked during the inspection.

5.2. Instrument performance:

Sensor Heights

Parameter	Desirable Height above which sensor to be installed	Confirm	Recommendations
Air temperature & Relative humidity	1.25 - 2m		
Rainfall	0.6 to 1 m (AWS) Rooftop (ARG)		
Wind speed & Wind direction	3m (10 ft)		

Format for the comparison of AWS site data with the Travelling standard

Sr. No.	Time (IST)	Data logger	Travelling standard	NCIP Server	Remarks
1)	Rainfall(mm)	-	-	-	
2)	Temperature(°C)				
3)	Humidity (%)		--		
Sr. No.	Time (IST)	Data logger	Travelling standard	NCIP Server	
1)	Rainfall(mm)				
2)	Temperature(°C)				
3)	Humidity (%)				
Sr. No.	Time (IST)	Data logger	Travelling standard	NCIP Server	
1)	Rainfall(mm)				
2)	Temperature(°C)				
3)	Humidity (%)				

Data from the central server to show the functionality of sensors

Date/Time	Tavg	Tmax	Tmin	RH	Wind Speed	Wind Dir	Wind Gust	Rain

Photographs of the sites while inspectiona

(Minimum 4 photographs of each site visit are pasted as a part of the report)

Photo 1	Photo 2
Photo 3	Photo 4

Actual observation of sitting & exposure condition of AWS/ARG.

S No	Obstacle Type	North	South	East	West	Comment
1	Tree	o Small o Medium o Big	o Small o Medium o Big	o Small o Medium o Big	o Small o Medium o Big	
		Distance from the AWS/ARG in meters				
		Distance: Height:			Distance: Height:	
2	Building/ Office/ House	o Small o Medium o Big No. of floors = Width (mts) =	o Small o Medium o Big No. of floors = Width (mts) =	o Small o Medium o Big No. of floors = Width (mts) =	o Small o Medium o Big No. of floors = Width (mts) =	
		Distance from the AWS/ARG in meters				
		Distance: Height:	Distance: Height:	Distance: Height:	Distance: Height:	
3	Car Parking	o Small o Medium o Big Length (mts) = Breadth (mts) =	o Small o Medium o Big Length (mts) = Breadth (mts) =	o Small o Medium o Big Length (mts) = Breadth (mts) =	o Small o Medium o Big Length (mts) = Breadth (mts) =	NA
		Distance from the AWS/ARG in meters				
4	Expansion of Water	o Small o Medium o Big Radius (mts) =	o Small o Medium o Big Radius (mts) =	o Small o Medium o Big Radius (mts) =	o Small o Medium o Big Radius (mts) =	
		Distance from the AWS/ARG in meters				
5	Slope	o Gentle o Steep o Very Steep Angle (Degree) =	o Gentle o Steep o Very Steep Angle (Degree) =	o Gentle o Steep o Very Steep Angle (Degree) =	o Gentle o Steep o Very Steep Angle (Degree) =	
6	Grave Yard	Dist. From AWS/ARG =	Dist. From AWS/ARG =	Dist. From AWS/ARG =	Dist. From AWS/ARG =	
7	Water Tank	Distance =	Distance =	Distance =	Distance =	

(The above forms are filled at sites and store as permanent record.)

5.3. **Over all summary of observations will be based on the following:**

- The observations of, Temperature, Relative Humidity, Wind Direction and Wind Speed. & rainfall, were checked for accuracy limit as per WINDS.

- The sitting & exposure condition AWS site need to be checked for free from obstruction like tall buildings, tress, or any encumbrance as per the norms given in WINDS.

- The performance of sensors, data logger and supporting accessories such as solar panel and battery, communication devices are also checked during the inspection.

- The maintenance log also needs to be checked during the inspection.

Procedure for empanelment of 3rd Party NABCB Agencies by QCI

1. About NABCB

The National Accreditation Board for Certification Bodies (NABCB), a constituent Board of QCI, is the apex national accreditation body which provides accreditation to Certification as well as Assessment Bodies in accordance with ISO Standards, international requirements / guidelines and NABCB Accreditation Criteria.

NABCB is internationally recognized and represents the interests of the Indian industry at international cooperation frameworks such as the International Accreditation Forum (IAF), International Laboratory Accreditation Cooperation (ILAC) and its recognized regional bodies such as the Asia Pacific Accreditation Cooperation (APAC). Its objective is to promote acceptance of India's certifications and inspections internationally by becoming a signatory to the Multilateral/Mutual Recognition Arrangements (MLAs/MRAs) of these bodies after undergoing successful international peer evaluations

2. Process of Empanelment

Empanelment of Agencies or Procurement at QCI is undertaken in compliance with the provisions of the Service & Finance (S&F) Manual of QCI as approved by the DPIIT, Ministry of Commerce & Industry. QCI uses the services of its accredited bodies for sampling, inspection and testing projects. The brief of the process followed has been submitted below:

2.1. Requisition and Documentation

The requisitioning department raises a request to the Central Procurement Cell (CPC), mentioning the detailed specification and requirement of NABCB accredited bodies for the services to be procured as per the IAF scope code.

The bodies/agencies are being accredited under the various scope code as per there expertise.

2.2. Request for Proposal (RFP)

Central Procurement Cell, QCI prepares a Request for Proposal (RFP) document on the basis of requirements stated by the respective project team, which is floated after internal review and approval from the competent authority to invite proposals through the eligible list of service providers or from open market as may be applicable.

2.3. Invitation of Bids:

RFP prepared is floated to invite tenders from the relevant service providers, depending on the estimated values following ways are adopted:

2.3.1. Limited Tender Enquiry- For estimated value of work/service up to Rs.25,00,000/- (Twenty-five lakh - exclusive all the taxes), the method of Limited Tender Enquiry will be adopted in which tenders are invited from the empanelled service providers. Copies of the bidding document are received directly by speed post/registered post/courier/e-mail to QCI borne on the approved panels of such service providers.

2.3.2. Two bids system consisting of technical bid and financial bid can be adopted wherever it is considered necessary:

o Technical bid consisting of all the required technical information

o Financial bid indicating consideration amount for the scope of work and deliverables mentioned in the technical bid.

2.3.3. Advertised/Open Tender Enquiry- For estimated value of work/service of Rs. 25 lakhs and above can be procured by floating the tenders in two leading national dailies, QCI website, and on the Central Public Procurement Portal (CPPP) e-publishing module. Two bid system consisting of technical bid and financial bid can be adopted wherever it is considered necessary as mentioned above. QCI uses the services of its accredited bodies in case of sampling, inspection and testing projects through a limited enquiry for the bodies accredited under the relevant scope sectors.

2.4. Evaluation of the Bids Received:

Bids received are then evaluated by the respective technical committee. The Technical Bid and the Financial Bid are received in two separately sealed covers duly super scribed and both these covers are to be put in a bigger cover which is also sealed and super scribed.

2.4.1. Technical Evaluation:

The technical evaluation is done through a technical evaluation committee, duly formed for this purpose. The technical committee is responsible for bid evaluation and submitting a report for further financial evaluation.

2.4.2. Financial Evaluation-

At the second stage, financial bids of only the technically accepted offers are opened for further evaluation and ranked before the award of contract. The award of contract to the service providers is done based on Least Cost Selections (LCS) or Quality cum cost-based selection (QCBS) as per the laid down requirements and the scope of services. The financial evaluation and scrutiny of process is undertaken by an internally constituted Purchase Committee consisting of Senior members. This committee submits its final recommendations to the competent authority for approval.
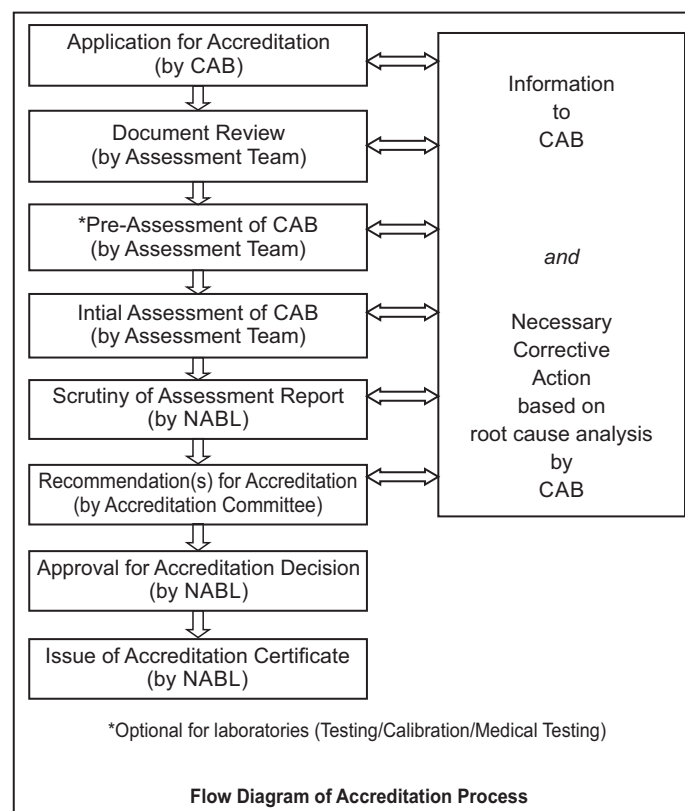
2.5. Award of Work Order-

Work order/Contract is awarded to the potential service provider after due completion of the evaluation process and approval of the competent authority.

Procedure for accreditation of calibration laboratories by NABL

1.   **Introduction**

The National Accreditation Board for Testing and Calibration Laboratories (NABL), another constituent board of QCI that accredits laboratories across scopes. NABL is a   Mutual Recognition Arrangement (MRA) signatory member of APAC (Asia Pacific Accreditation Cooperation) and ILAC (International Laboratory Accreditation Cooperation) since 2000. NABL in the year 2016 achieved the APAC MRA signatory status for Proficiency Testing Providers (PTP) and Reference Material Producers (RMP) schemes along with extension in the existing fields of Testing, Calibration and Medical till December 2020. In October 2019, NABL has also obtained ILAC MRA for Proficiency Testing Providers (PTP) accreditation program (ISO/IEC 17043) in addition to existing Testing including Medical (ISO/IEC17025 and ISO15189) and Calibration (ISO/IEC17025) programs.

2.   **Procedure for NABL accreditation**

Application for Accreditation (by CAB)	⟺	Information to CAB
Document Review (by Assessment Team)	⟺	
*Pre-Assessment of CAB (by Assessment Team)	⟺	*and*
Intial Assessment of CAB (by Assessment Team)	⟺	Necessary Corrective Action based on root cause analysis by CAB
Scrutiny of Assessment Report (by NABL)	⟺	
Recommendation(s) for Accreditation (by Accreditation Committee)	⟺	
Approval for Accreditation Decision (by NABL)		
Issue of Accreditation Certificate (by NABL)		

*Optional for laboratories (Testing/Calibration/Medical Testing)

Flow Diagram of Accreditation Process

2.1. **Application Submission:** The laboratory seeking accreditation must submit an application to NABL, providing details about their organization, scope of calibration services, facilities, equipment, and quality management system documentation.

2.2. **Document Review:** NABL assesses the submitted documents to verify if the laboratory meets the requirements specified in ISO/IEC 17025, which is the standard for calibration laboratory accreditation. This includes reviewing the quality manual, procedures, policies, records, and other relevant documents.

2.3. Pre-Assessment: NABL may conduct a pre-assessment visit to the laboratory to evaluate its readiness for the formal assessment. This helps identify any gaps or areas that need improvement before the actual assessment.

2.4. Formal Assessment: The laboratory undergoes a comprehensive assessment by a team of qualified assessors appointed by NABL. The assessment includes an examination of the laboratory's management NDT system, technical competence, personnel competency, calibration procedures, equipment, traceability of measurement standards, and adherence to ISO/IEC 17025 or equivalent requirements.

2.5. Corrective Actions: If any non-conformities or deficiencies are identified during the assessment, the laboratory must implement corrective actions to address them within a specified timeframe.

2.6. Follow-up Assessment: Once the corrective actions are completed, NABL may conduct a follow-up assessment to verify the effectiveness of the corrective measures.

2.7. Decision and Accreditation: Based on the assessment findings, NABL makes a decision regarding accreditation. If the laboratory meets all the requirements, NABL grants accreditation for the specified scope of calibration services. The laboratory receives an accreditation certificate and is listed on the NABL website.

2.8. Surveillance and Reassessment: Accredited laboratories are subject to regular surveillance assessments by NABL to ensure their continued compliance with the accreditation requirements. Periodic reassessments are also conducted to renew the accreditation.

2.9. It's important to note that the exact procedure may vary slightly, and it's advisable for laboratories to refer to the specific guidelines and documents provided by NABL for detailed information on the accreditation process for calibration of sensors and instruments.

3. Scope of Accreditation

NABL Accreditation is currently given in the following fields and disciplines. The multi-disciplinary CABs shall have to apply in relevant discipline separately depending upon to which discipline the scope belongs.

TESTING LABORATORIES	CALIBRATION LABORATORIES	MEDICAL LABORATORIES
• Chemical • Biological • Mechanical • Electrical • Electronics • Fluid Flow • Forensic • Non-Destructive (NDT) • Photometry • Radiological • Diagnostic Radiology QA Testing • Software & IT System	• Mechanical • Electro Technical • Fluid Flow • Thermal • Optical • Medical Devices • Radiological	• Clinical Biochemistry • Clinical Pathology • Haematology • Microbiology & Infectious disease serology • Histopathology • Cytopathology • Flow Cytometry • Cytogenetics • Molecular Testing

Memorandum of Understanding (MoU) Between MNCFC and QAP

Memorandum of Understanding

Between

Mahalanobis National Crop Forecast Centre (MNCFC), Department of Agriculture, Cooperation and Farmers' Welfare, Ministry of Agriculture & Farmers' Welfare, Government of India, Sahyadri Ave, Pusa, New Delhi, Delhi 110012

And

<Name of the QAP>, <Address of the QAP>

Mahalanobis National Crop Forecast Centre (MNCFC) has been established under the Department of Agriculture and Farmers Welfare (DA&FW), Ministry of Agriculture and Farmers Welfare (MoA&FW), Government of India (GoI) for applications of space and geospatial technology in various domains of agriculture, which expression shall unless excluded by or repugnant to the context, be deemed to include its successors-in-interest and permitted assigns (hereinafter referred to as "MNCFC") of the **ONE PART.**

AND

The **<Name of QAP>,** <Brief description and Address of QAP> (hereinafter referred to as "QAP") which expression shall, unless excluded by or repugnant to the context, be deemed to include its successors-in-interest and permitted assigns of the **SECOND PART**.

The MNCFC and **<Name of QAP>** are hereinafter also referred to individually as "Party" or collectively as "Parties").

This Memorandum of Understanding (hereinafter referred to as "MoU") sets forth the relationship and obligations between the Parties relating Implementation of the WINDS (Weather Information Network Data System) initiative, specifically focusing on quality assurance and verification of AWS/ARG network and data

PREAMBLE

WHEREAS,

- MNCFC is a prestigious government organization established under the Department of Agriculture and Farmers Welfare (DA&FW), MoA&FW, GoI. It serves as a vital institution in the field of crop acreage estimation, drought forecasting etc., with the primary objective of providing accurate and reliable information on crop production and yield estimation. MNCFC is entrusted with the responsibility of collecting, analyzing, and interpreting diverse agricultural data to generate comprehensive crop forecasts. Its expertise lies in employing advanced statistical models, remote sensing techniques, and modern technologies to assess crop health, monitor agricultural practices, and predict crop yields with precision. MNCFC's insightful forecasts play a crucial role in informing policy decisions, supporting farmers' welfare, and ensuring food security at the national level.

- **<Name of QAP>** <Description of QAP>.

- The GoI is implementing the WINDS initiative, which aims to establish a robust national-level network of Automatic Weather Stations (AWS) and Automatic Rain Gauges (ARG) for generating long-term hyperlocal weather data.

- **<Name of QAP>** has been nominated as the Quality Assurance Partner (QAP) under WINDS, responsible for conducting third-party quality assessment of the AWS/ARG network and the resulting data.

- MNCFC and **<Name of QAP>** desire to collaborate and establish a framework for cooperation to achieve the objectives of WINDS and enhance the quality control and quality assessment processes.

- MNCFC and **<Name of QAP>** agree to provide support, to activities covered under this MoU subject to details outlined in subsequent articles to this MoU.

1. **GENERAL PROVISION**

   The purpose of this MOU is to outline the terms and conditions of cooperation for scope of work, roles and responsibilities between MNCFC and <Name of QAP> in the implementation of WINDS initiative, specifically focusing on quality assurance and verification of AWS/ARG network and data. It is agreed that the Parties to this MoU shall work under this agreement with due care and diligence, and as per the guidelines and protocols of the WINDS Manual 2023, as amended from time to time, thereby, always safeguarding the interests of both Parties.

2. **AIM**

   In accordance with the relevant provisions of the MOU, MNCFC and <Name of QAP> will work with an aim to establish a collaborative framework for quality assurance and verification of weather data collected through the WINDS initiative. The MOU aims to enhance the accuracy, reliability, and consistency of the AWS/ARG network and data transmission procedures, ensuring the availability of high-quality hyperlocal weather information for effective disaster risk resilience, agriculture planning, and other sectors. Through this collaboration, MNCFC and <Name of QAP> seek to strengthen the implementation of WINDS by facilitating the exchange of information, conducting third-party quality assessments, developing quality check systems, and promoting a culture of continuous improvement in the collection and analysis of weather data. Ultimately, this MOU aims to contribute to the strategic decision-making process of the Central/State/UT Governments and other stakeholders by providing them with real-time, reliable, and quality-assured weather data for risk mitigation strategies and seamless dissemination of services.

   This document is not intended to create legal or binding obligations on either party. It serves only as a record of the parties' current intentions before any of the activities set out in this MoU are implemented, to ensure the activities can be accomplished in conformity with the law.

3. **SCOPE OF COOPERATION**

   Areas of cooperation between MNCFC and **<Name of QAP>** in implementing the WINDS initiative, with a specific focus on quality assurance, third-party verification, and the actions on Flagged data based on algorithmic quality check systems over WINDS portal and other agreed activities that further the aims and objectives of the Institutions are as follows:

3.1 General Scope

Exchange of Information: MNCFC and <Name of QAP> shall facilitate the exchange of relevant information, including technical guidelines, protocols, and quality control procedures, to ensure alignment and adherence to the established standards. This exchange of information will enhance the quality assurance process and promote uniformity in data assessment.

Collaboration in Quality Assessment: MNCFC and <Name of QAP> shall collaborate closely in the quality assessment of the AWS/ARG network and data transmission procedures. <Name of QAP>, as the designated Quality Assurance Partner (QAP), shall conduct third-party verification and quality checks of AWS/ARG siting, equipment, and data, utilizing the protocols defined in the WINDS Manual 2023, as amended from time to time.

On-Site Visits: <Name of QAP> shall conduct on-site inspections of AWS/ARG stations to verify the proper siting, fencing, and functioning of the stations.

Algorithmic Quality Check: <Name of QAP> shall develop and deploy an algorithm for quality checks of data gathered from all AWS/ARG centers as per the WINDS Manual 2023, as amended from time to time. This algorithmic quality check system will analyze the collected data in real-time, identify any anomalies or discrepancies, and provide timely alerts for corrective actions.

Central Monitoring Hub: <Name of QAP> shall establish a central monitoring hub at its office in New Delhi to centralize the data analysis process. WINDS Portal will incorporate the algorithmic quality check system developed by <Name of QAP> and generate real-time alerts for wrong or

missing data. MNCFC shall cooperate in providing necessary data access and support for the hub's operation.

<Name of QAP> shall involve DA&FW/MNCFC as a member in all procurement processes related to the activities of current MoU.

3.2 Obligations of MNCFC

Data Provision: MNCFC shall provide **<Name of QAP>** with access to relevant data, reports, and documentation required for quality assessment and algorithm development. This includes sharing weather data, reports on AWS/ARG installations, and any other information necessary for **<Name of QAP>** verification processes.

3.3 Obligations of <Name of QAP>

3.3.1. On-site Visit and Verification

- **<Name of QAP>** shall undertake third-party quality assessment of the AWS/ARG network and the resulting data as per the quality control and quality assessment protocols defined in the WINDS Manual 2023, as amended from time to time.
- **<Name of QAP>** shall conduct on-site inspections of AWS/ARG stations to verify their proper siting, fencing, and working, as well as the data recorded and transmitted during inspection and flagged-data in WINDS portal.

3.3.2. Central Monitoring Hub and Quality Check

- <Name of QAP> shall set up a central monitoring hub at its office in New Delhi.
- Flagged data over the WINDS Portal: <Name of QAP> shall manually verify and analyze a certain risk-based percentage of data/ARG/AWS from each state to authenticate the data gathered on the WINDS Portal.
- Reporting and Recommendations: <Name of QAP> shall provide regular reports (fortnightly interval) as well as need-based reports to MNCFC on the findings of the quality assessments, including any identified issues or areas of improvement. <Name of QAP> shall also offer recommendations for corrective actions to enhance the overall quality and reliability of the weather data.

3.4 Recurring Malfunctions and Reassessment Charges

- If **<Name of QAP>** identifies any discrepancy during a visit, MNCFC shall take necessary action.
- In case of recurring malfunctions at the same location, the cost of the 2nd and 3rd visits for reassessment shall be charged extra.

4. DURATION OF MOU

The effective date for this MoU is **<DD/MM/YYYY>**. The duration of this MoU will be for a period of **5 years** effective **from <DD/MM/YYYY> to <DD/MM/YYYY>**.

This MoU shall be terminated in the following instances:

1. On the completion of the period of the MoU, if there is no agreement for renewal;
2. Apart from the above-mentioned termination clauses, either party may terminate this MoU by giving a written notice of intent to terminate to other party, not less than Sixty (60) calendar days prior to the effective date of the termination.

5. FINANCIALS

This is a general MoU for co-operation for assignment. The specific terms and condition between parties such a financial support, terms of payment, time schedule and other applicable commercial terms and conditions shall be discussed, agreed upon and incorporated separately as annexure to this MoU, on the basis of the requirements of the intended schemes and programmes.

6. INDEMNITY

Parties agree to defend, indemnify and hold other party and its employees, directors, and officers harmless for any and all claims, losses, due to breach of contract on account of any negligent act or omission, any breach of its obligations provided in this Agreement or any violation of applicable

law, rule or regulation by either party or its agents during and after the term of the MoU.

7. **NOTICE AND POINTS OF CONTACT**

    <Name of QAP> and MNCFC will each designate a principal point of contact for the implementation of this Agreement. These officials are identified below:

For MNCFC:	For <Name of QAP>:
Department of Agriculture, Cooperation and Farmers' Welfare,	**<Address of QAP>**
Ministry of Agriculture & Farmers' Welfare, Government of India, Sahyadri Ave, Pusa, New Delhi, Delhi 110012	
Attention:	
Email:	Attention:
Contact No.	Email:
	Contact No.

8. **DISPUTE RESOLUTION**

    Any dispute, controversy or claim arising out of or in relation to this MoU, or the breach, termination or invalidity thereof, shall be settled amicably by negotiation between the Parties.

9. **SEVERABILITY**

    If any provision (or part thereof) of this Agreement is unenforceable or held to be in violation of any applicable law, the same shall be severed from this Agreement and the remainder of the Agreement shall remain in full force and effect, until renegotiated and agreed upon. Notwithstanding the foregoing, the Parties shall negotiate in good faith to agree on the terms of a mutually acceptable alternative provision in place of the provision so severed.

10. **MISCELLANEOUS**

10.1. The headnotes to the clauses of this Agreement are inserted for reference purposes only and shall not affect the interpretation of any of the provisions to which they relate.

10.2. **Force Majeure:** Should circumstances arise that hinder wholly or in part either Party from fulfilling its obligations hereunder, namely: fires, acts of God, epidemic/ pandemic hostilities of any kind, blockades, import/export bans or any other circumstances beyond the control of the Parties, the Parties shall be relieved from their obligations hereunder for the duration of such circumstances. A Party for which it has become impossible to fulfil its obligations under this Agreement must notify the other Party within no later than Fifteen (15) calendar days of the commencement and cessation of circumstances preventing the Party concerned from meeting its obligations. The documentation provided by relevant organizations will serve as legitimate proof of the existence of such circumstances. The failure of a party to fulfil any of its obligation hereunder shall not be considered to be a breach of or default under this MoU in so far as such inability arises from occurrence of Force Majeure event.

10.3. **Amendments:** This MoU may be modified, altered, revised, extended or renewed by mutual written consent of both the parties, by the issuance of a written amendment, signed and dated by an authorized representative of both the parties.

10.4. **Counterparts:** This MoU may be executed simultaneously in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one instrument.

10.5. **Assignment:** None of the Parties may assign or transfer any right, interest or claim (or any part thereof) under this MoU without the express written consent of the other Parties.

10.6. Governing Law: This MoU shall be governed by, and construed in accordance with the prevailing laws of India and parties hereby submit to the sole and exclusive jurisdiction of appropriate courts in New Delhi, India.

10.7. This MoU shall not be valid until approved and executed by authorized representatives of both MNCFC and <Name of QAP>. Further signatory to this MoU represents and warrants that they have all the necessary authority and power to enter into this MoU and perform its obligations hereunder.

11. The specific terms of this MoU do not preclude the development of future collaborative ventures or projects not mentioned in this document.

IN WITNESS WHEREOF, the parties hereto have signed this MoU in two sets of originals,

For and on behalf of **MNCFC**   For and on Behalf of **QAP**

                                                                                    <Name of QAP>

Mahalanobis National Crop Forecast Centre

                                                                                    ....
....   <Designation>
Director, MNCFC   Dated: <DD/MM/YYYY>

Dated: <DD/MM/YYYY>

Witnesses (Signature):   _____
_____   ....
....

Standard Operating Procedure for AWS/ARG Installation/Deployment by WIPs

Pre-Deployment Check list (indicative):

1. Ensure that, you have received all the required material (sensors, DL, Batteries, Solar Panels, accessories, hardware, software) for the installation and are in working condition.

2. Ensure that all the instruments including sensors received for installation of AWS/ARG are calibrated by IMD or NABL accredited laboratories and conforms to specifications/requirements laid down in this manual.

3. Ensure that Factory Acceptance Test certificate (FAT) has been received along with the material for installation of AWS/ARG.

4. Ensure that received site survey has been conducted and report regarding the same has been submitted on WINDS portal.

5. Ensure that the same mobile service provider which was recommended in the site survey report has been selected for providing SIM cards and services.

6. Ensure that, the battery received with data logger is fully charged.

Deployment Check list (indicative):

1. Confirm that, the site is as per the site survey report and fulfilling the siting norms. Report if not.

2. Ensure that, the mounting mast is upright and making 90° angle to the ground.

3. Confirm that, the mounting pole of TBRG is upright and making 90° angle to the ground and its height is 30 cm above from the ground.

4. Identify the North direction of the site, make mark on the mast as well as on the mast foundation.

5. Install anemometer at the top of the mast (i.e., 3 m from the ground).

6. Ensure that, the North direction marking on the sensor is facing towards the North direction.

7. Ensure that, temperature and relative humidity sensor (with radiation shield) is installed at the height of 1.25 to 2m from the ground surface.

8. While installing the TBRG on the mast, ensure that, the connecting cable of the TBRG goes through the conduit pipe and base of the TBRG is above 30 cm above the ground.

9. Mount the solar panel at suitable height with suitable angle along the South direction so that it can work with optimum efficiency.

10. Mount the Data Logger at suitable height without disturbing sensors position.

11. Connect all the sensors and solar panel to the data logger.

12. Check the functionality of all the sensors, DL and Solar Panel and communication of the station to the server.

Post-Deployment indicative Check list (indicative):

1. Check temperature and humidity readings and compare with reference sensor. Take five set of observations for the comparison.

2. Check and compare wind sensor's reading with reference sensor. Take five set of observations for the comparison.

3.   Ensure that, the buckets lock/tie is open, and its movement is free.

4.   Ensure that, the levelling bubble of the TBRG is at centre position.

5.   Ensure that, both the buckets are tipping on accumulation of 5 ml of water in it.

6.   Ensure that, after every tip data logger shows 0.25 mm of rainfall on the DL screen/display.

7.   Ensure that, all the cables are neatly tied with the help of cable-tie and adhesive tape/conduit.

8.   Generate Site Acceptance Test Certificate (SAT) based on the comparison of on-site sensors against reference sensor and submit the report to the server.

Submission

1.   Submit the installation report to the server.

2.   Keep the station under observation at least 24 hours. If found okay register the station on WINDS Portal.

General Guidelines for AWS/ARG site preparation and installation

The quality of the AWS/ARG data & the life span of the AWS/ARG station is totally dependent upon quality of the installation. The following minimum norms should be followed for the installation of AWS/ARG.

1. Site Selection

1.1. The AWS is to be located on a level piece of ground, covered with short grass or natural earth ideally 5 m x 7 m in dimension. In cases of non-availability of space and in tough terrains, 5 m x 5 m would be sufficient with prior approval from State/UT Government.

1.2. The ARG is to be located on a level piece of ground, covered with short grass or natural earth ideally 4 m x 3 m in dimension. In cases of non-availability of space, of in case of flood prone areas the maximum height of such ARGs can be the rooftop of the one-story building.

1.3. The site shall be levelled, cleared of bushes, unplanned growth of trees, high-tension wires and other obstructions which may hamper the working of the AWS/ARG.

2. AWS/ARG Civil Work

2.1. Proper foundation should be laid for civil work at the site with RCC of 1:2:4, 2 feet below ground level to 0.5 feet above ground level for the Mast for installing AWS/ARG sensors and electronics, fencing and other equipment to be installed.

2.2. Mast for mounting the sensors should be made up of Aluminium or GI material of 1.5-inch diameter and gauge 2 or better.

2.3. The fencing of the AWS/ARG site should be done in such a manner that it ensures the safety of the instruments in the remote locations.

2.4. A suitable chain-link or barbed wire fence with a gate and Signboard at each AWS/ARG site shall be preferable.

2.5. All metallic components should be painted with standard quality-approved anti rust coating paints. Painting of fencing, chain-link and gate to be done properly at least once a year.

2.6. The approach to the site should be made free of obstacles like bushes, trees etc., should be beyond the reach of pets & the other animals and should be easily accessible by the installation and maintenance team.

3. Enclosure/Fencing/Chain-link

3.1. The height of the fencing for the AWS/ARG site enclosure must be at least 1.5 meters above ground level.

3.2. The fencing must be made over a cement foundation which is nine inches above ground level.

3.3. Fencing angle should be of size 50mm x 50mm x 6mm and pre coated with red-oxide. The total height of the fencing angle should be 2.3 meters i.e. (1.5m above ground level + 0.8 m below ground level).

3.4. Two MS angles must be used diagonally at each of the four corner angles of the site. The angles can be attached (with welding or the other appropriate means) from the middle of the existing corner angle to the ground. The depth of the support will remain the same as of main angle.

3.5. The dimensions of the fencing angle foundation should be 1.0 ft x 1.0 ft (length x width) and at a depth of 3 feet. The foundation should be square shaped.

3.6. Distance between each fencing angle should be 1 meter.

3.7. Chain-link mesh must be stretched and welded/fixed properly on the fencing angles.

3.8. A pipe or angle must be fixed on the upper part of the fencing to have a neat finishing and at the same time to avoid loosening of the fencing over a period of time.

3.9. The Chain-link fencing should be fastened with the help of screws fitted on the fencing angles. Alternately it may be welded neatly at four equidistant positions of 0.5 meter each.

3.10. Gate should have proper support of MS angles with additional support of crossed MS angles. Alternately gate should be fixed with the support of RCC pillars.

3.11. Suitable locking facility with 3 keys for safety purposes is mandatory. One set is to be handed over to the department.

4. **Tower/Mast Foundation**

4.1. This is the platform on which the life of the AWS/ARG system is dependent. It should be strong enough to sustain the weight of the mast of the AWS/ARG instrument in adverse weather.

4.2. The mounting pole of TBRG shall be upright and making 90° angle to the ground and its height is 30 cm above from the ground.

5. **Automatic Rain Gauge foundation**

The foundation of the rain-gauge should be such that it can sustain the sensor even in the case of very heavy rain. The orientation of the sensor should not be perturbed in case of heavy rain.

6. **Anchor Rod and Guy rope**

In case of AWS system, the anchor rod supports the AWS mast. It should be rugged & strong.

7. **Local Earthing**

It is a common perception that most of the outdoor instruments, start malfunctioning because of the improper earthing. It should be done in such a manner that it protects the AWS from any earthing/static discharges issues.

8. **Painting**

7.1. To protect the AWS from environmental hazards & avoid the rusting, the AWS & its various components should be painted accordingly.

7.2. The fencing angles, chain-link/barbed wire fencing, gate and the sign board shall be suitably painted to avoid rusting and to withstand the vagaries of the weather.

Checklist format for uploading commissioning report on WINDS portal through WINDS app

S.No.	Parameter		Details	Remarks
A	**Automatic Weather Station (AWS) - General Information**			
A1	AWS Unique ID	:	<Enter/Scan/Auto populate>	
A2	AWS Latitude	:	<Degree Decimal, up to 5 decimal Places>	
A3	AWS Longitude	:	<Degree Decimal, up to 5 decimal Places>	
A4	Name of the State	:	<Select From Dropdown/Auto populate>	
A5	Name of the District	:	<Select From Dropdown/Auto populate>	
A6	Name of the Sub - District/Taluka/Block	:	<Select From Dropdown/Auto populate>	
A7	Name of the Revenue Circle	:	<Select From Dropdown/Auto populate>	
A8	Name of the Gram Panchayat	:	<Select From Dropdown/Auto populate>	
A9	Name of the Village	:	<Select From Dropdown/Auto populate>	
A10	Name of the WINDS Local Guardian	:	<Select From Dropdown/Auto populate>	
A11	Station Established and Maintained by	:	<Name of WINDS Implementation Partner/Auto populate>	
A12	Land Provided by	:	<Name of the Department, Government/Auto populate>	
A13	Land Handed over to the WIP on		<DD/MM/YYYY>	
A14	Station Commissioned On <Date & Time>	:	<DD/MM/YYYY>/Auto populate	
B	**Siting & Civil Work**			
B1	AWS Plot Size	:	Select from Dropdown <7m*5m> or <5m*5m>	
B2	Whether Plot Size Conforms with WINDS Manual 2023: i) AWS - 5m * 7M ii) ARG - 4m * 3m	:	<YES/NO>	

S.No.	Parameter		Details	Remarks
B3	If Plot Size does not conform with B2, Reason along with requisite Approval as per WINDS Manual	: :	<Hilly/Undulated Terrain, Unavailability of Space etc.> Option to Upload Document/Photograph	
B4	Is the Surface Levelled	:	<YES/NO>	
B5	Whether site surrounded by bushes, unplanned tree growth, high-tension wires other obstructions which may hamper working of the AWS/ARG?	:	<YES/NO>	
B6	Whether proper earthing installed	:	<YES/NO>	
B7	North Direction Identified and Marked on Mounting Mast and Foundation	:	<YES/NO>	
B6	**Mounting Mast**			
i	Proper Foundation laid with RCC of 1:2:4, 2 feet below ground level to 0.5 feet above ground level	:	<YES/NO>	
ii	Mast for mounting the sensors made up of Aluminium or GI material of 1.5-inch diameter and gauge 2 or better	:	<YES/NO>	
iii	Mounting mast is upright and at 90° w.r.t the ground	:	<YES/NO>	
iv	Height of the Mounting Mast (in meters)	:		
v	Is anchor rod/guy rope installed	:	<YES/NO>	
vi	Height of TBRG Mounting Mast (In meters)	:		

S.No.	Parameter		Details	Remarks
vii	TBRG Mounting mast is upright and making 90° angle to the ground	:		
viii	Whether tilt sensor/clinometer installed	:	<YES/NO>	
B7	**Fencing/Chain-link**			
i	Height of the Fencing (in meters)	:		
ii	Whether Proper Foundation laid with RCC of 1:2:4, which is 9 inches above ground level	:	<YES/NO>	
iii	Dimensions of the fencing angle foundation (Length=1.0 ft x Width=1.0 ft x Depth=3 ft)	:		
iv	Size of the Fencing Angle (50mm x 50mm x 6mm)	:		
v	Total height of the fencing angle (2.3 meters i.e., 1.5m above ground level + 0.8 m below ground level)	:		
vi	Distance between fencing angles (1 meter)	:		
vii	Chain-link fencing installed	:		
B8	All metallic components painted with quality -approved anti rust coating paints	:	<YES/NO>	
C	**Sensors and Other Equipment**			
C1	**Deployment Checklist**			
i	Anemometer is installed at top of the Mast (3m above ground level)	:	<YES/NO>	

S.No.	Parameter		Details	Remarks
ii	Height of Temperature Sensor (1.25 to 2m) (in meters)	:		
iii	Temperature Sensor Installed with Radiation Shield	:	\<YES/NO\>	
iv	Height of Relative Humidity Sensor (1.25 to 2m) (in meters)	:		
v	Relative Humidity Sensor Installed with Radiation Shield	:	\<YES/NO\>	
vi	Height of TBRG (at least 30 cm above surface)	:		
vii	Data logger installed at a suitable height without disturbing sensors position	:	\<YES/NO\>	
viii	All the Sensors are connected to the Data Logger	:	\<YES/NO\>	
ix	Are the cables neatly tied with cable -tie and adhesive tape/conduit	:	\<YES/NO\>	
x	Is tilt sensor/clinometer installed on AWS mast	:	\<YES/NO\>	
C2	**Post-Deployment Checklist**			
i	Check temperature readings and compare with reference sensor	:		Provision for taking five set of observations for the comparison
ii	Check relative humidity readings and compare with reference sensor	:		
iii	Check Wind Speed readings and compare with reference sensor	:		

S.No.	Parameter		Details	Remarks
iv	Check Wind Direction readings and compare with reference sensor	:		
v	TBRG - Bucket lock/tie is open, and its movement is free	:	<YES/NO>	Provision for taking five set of observations for the comparison
vi	TBRG - Levelling bubble is at centre position	:	<YES/NO>	
vii	TBRG - both the buckets are tipping on accumulation of 5 ml of water in it	:	<YES/NO>	
viii	TBRG - after every tip data logger shows 0.25 mm of rainfall on the DL screen/display	:	<YES/NO>	
D	**Reports**			
D1	Sensor Calibration Reports by IMD or NABL accredited Laboratories	:	<YES/NO>	
D2	Site Acceptance Test (SAT) based on the comparison of on -site sensors against reference sensor submitted to WINDS Portal	:	<YES/NO>	
E	**Generate Commissioning Report on WINDS Portal**			

Calibration Processes and Methods for AWS/ARG Stations by the WIPs

Timely and frequent calibration of the sensor provides reliability, accuracy quality to the sensors as well as to the data. It can be done in the laboratory as well as on the field. In laboratory the sensors are calibrated under controlled environment. Whereas the field calibration has been done on the field in dynamic and uncontrolled environment. Equipment used at site shall be calibrated by NABL accredited laboratories. Reference standards used for verification also to be calibrated through NABL accredited laboratory. Field calibration can be done by two methods i) at actual field with travelling standards traceable to international standards through calibration from NABL Accredited laboratory and ii) By comparing with reference grade AWS station which has traceability to international standards through calibration from NABL Accredited laboratory. The sensors having tested, compared and calibrated by this method will be having traceability with reference standard AWS and Travelling standards used in this process.

1. Calibration Equipment

Figure 7: Reference standard AWS

Figure 8: Sensors collocated with Reference Grade AWS for field calibration and comparison on field

Figure 9: Reference Travelling Standard Kit for actual site calibration:

Figure 10: Reference Travelling Standard Whirling Psychrometer.

2. Calibration procedure

2.1. Standardized Procedure for Tipping Bucket Rain Gauge (TBRG)

Constant water flow generator of various intensities or rain gauge calibrator is used to calibrate the TBRG. These TBRGs ideally should have ability to generate constant water flow of 50 mm/hr, 100 mm/hr, 200 mm/hr and 500 mm/hr. Pulse counter is used to count the pulses generated by TBRG sensor for the various intensity flow of known volume.

1. Following environmental condition has been noted and reported during each calibration

a) Date and Hour (start/End)

b) Air temperature (°C)

c) Water Temperature (°C)

d) Atmospheric Pressure (hPa)

e) Ambient Relative Humidity (%)

2. The number of tests performed for each instrument, their description in terms of time units and/or number of tips has been documented.

3. Relative error of TBRG"

The relative error is evaluated for each reference flow rate as:

$$e = \frac{I_{m-}I_r}{I_r} \times 100$$

where I_m is the intensity measured by the instrument and I_r the actual reference intensity provided to the instrument.

4. Five tests or a minimum of three tests has been performed for each set of reference intensities, so that five error figures are associated with each instrument. The average error and the average values of Ir and Im are obtained by discarding the minimum and the maximum value of e obtained for each reference flow rate, then evaluating the arithmetic mean of the three remaining errors and reference intensity values.

2.2. Standardized Procedure for Air Temperature, Relative Humidity, Wind Speed and Direction

1. Simultaneous continuous collocated measurements with reference grade AWS sensors have been conducted for the calibration. The sensors calibrated by this method has been used to replace with the field sensor which has been detected drift or bias in on field calibration/testing with reference travelling standards.

2. Simultaneous long term (24 hrs) collocated measurements with reference grade AWS sensors has been conducted for the confirmation of the observed drift or bias in the field sensor during field calibration. Based on the result obtained from this testing the sensor has been handed over to the R & D embedded system unit for further decision i.e repair or discard the sensor.

3. Bias and precision were calculated using the equation below:

$$Bias = \frac{1}{n} \sum_{1}^{n} (S - R)$$

$$Relative\ mean\ bias = \frac{\sum_{1}^{n}(S - R)}{\sum_{1}^{n} R}$$

$$Precision = \sqrt{\frac{\sum_{1}^{n}(S - R)^2}{n}}$$

$$Relative\ precision = \frac{\sum_{1}^{n} |S - R|}{\sum_{1}^{n}(R)}$$

Where,

S = Sensor Value

R = Reference Sensor Value

n = number of samples.

Standard Operating Procedure for AWS/ARG Maintenance

AWS/ARG maintenance shall cover on-site maintenance of the hardware, software, sensors, electronics and all civil work. The following maintenance mechanism is proposed under WINDS

a) Preventive Maintenance: Preventive maintenance should be done quarterly and once every month for the four monsoon months (June to September).

b) Corrective Maintenance: Corrective maintenance should be on call there is no constraints. Corrective maintenance must be attended within 3 working days from the day of fault/breakdown reported

c) Adaptive Maintenance: Adaptive maintenance is required to consider the rapid changes in technology and the availability of spare parts after a few years.

d) Calibration- Both field inspection with traveling standards and laboratory inspection will be conducted at regular interval. For faster and quicker movement and response, spare parts sub-inventory needs to maintain at cluster level. Ensure that, you are always maintaining 10 % of the spare parts of total cluster in your inventory.

For both, Preventive and Corrective maintenance following guidelines / checklist should be followed.

1. Pre-Maintenance Check List:

The representatives of the WIPs shall ensure the that:

a) their mobile battery is fully charged.

b) they are carrying a toolbox containing all required of maintenance tools.

c) they have understood the breakdown issue and associated activities.

d) they are carrying required spare parts and accessories as per the breakdown call.

e) they have looked upon and are familiar with the operational history of the station to be visited.

2. Maintenance Check List:

Note down and report the overview of physical inspection of the site on hanging of wires, theft/damage of equipment, grass, civil and fencing status, new obstacle raised if any)

4.3. Sensors:

a) Ensure that north marking/arrow is aligned to the North direction of the station.

b) Check wear and tear of the anemometer.

c) Check anemometer connection and ensure its functionality.

d) Check the anemometer cable, if required change the cable.

e) Clean the anemometer connectors, connect to the DL and ensure its functionality again.

f) Ensure that the ATRH (Atmospheric Temperature & Relative Humidity Sensor) sensor is mounted at the height of 1.25 to 2 meter from ground

g) Check the connection of the ATRH sensor and ensure its functionality.

h) Check the ATRH cable. If required change the cable.

i) Remove ATRH sensor and clean the radiation shield.

j) Check filter cap of ATRH sensor. if dust accumulated on it change the filter cap. (Filter cap should be replaced after every three months.)

k) Clean the sensor gently and remove the dust and dirt accumulated on it.

l) Clean the ATRH connectors.

m) Ensure that you are installing ATRH sensor at the height of 1.25 to 2 meter from ground.

n) Check the functionality of ATRH sensor.

o) Check and compare ATRH sensor's instantaneous measurement with the Whirling Psychrometer's measurements. Take 3 to 5 sets of observations for the comparison. Report all the measurements in Designated mobile application.

4.4. Inspect the TBRG (Tipping Bucket Rain Gauge) and comment on:

a) Position of the TBRG: Whether it is upright or tilted/leaned

b) Whether any debris accumulated in the funnel of the TBRG.

c) Whether the bubble of the level meter is at the centre.

d) Rusting observed on any part of the TBRG.

e) Remove the debris from the funnel (if observed any) and clean the funnel.

f) Remove the rust (if observed any) with the help of spray WD-40.

g) Apply anti rust spray/oil/grease on the rusted part.

h) Ensure or adjust the level meter bubble at the centre.

i) Ensure that the buckets are moving freely

j) Calibrate the bucket with the help of syringe and ensure that both the buckets are tipped on 5 ml volume of water.

k) Ensure that the DL records and show 0.25 mm rainfall after every tip.

l) Check the TBRG cable if required change the cable.

m) Clean the TBRG connectors and ensure the functionality of the TBRG.

4.5. Power Unit:

a) Check solar panel connections.

b) Check and report solar panel voltage.

c) Check battery connection.

d) Check and report battery voltage.

e) Check and report battery output terminal voltage.

f) Clean and mount the solar panel.

g) Ensure that the solar panel is mounted on South direction and with proper angle.

4.6. Communication unit:

a) Check and report DL IMEI.

b) Check and report CCID of SIM.

c) Check antenna connection.

d) Remove SIM card and clean the slots softly.

4.7. Post-Maintenance Check List:

a)   Ensure that all the screws are tightened properly.

b)   Ensure that all the clamps are tightened properly.

c)   Ensure that all the cables are neatly tied with cable tie or adhesive tape.

d)   Ensure that you have selected correct location name from the drop-down list of the designated mobile application. Please reconfirm it.

e)   Ensure that you have correctly reported material requirement.

f)   Ensure that you have filled comment section of the application correctly and precisely.

g)   Ensure that you have filled log card properly.

h)   Check the stations communication with the server by reporting to your reporting manager.

4.8. Submission:

a)   Ensure and confirm that all the fields in the maintenance report are filled completely.

b)   Submit duly filled maintenance report to server. (Server will not accept partially filled report)

c)   Site Leaving Permit (SLP) will be generated in the application after the successful submission of the maintenance report.

d)   If it is not generated automatically, ask your reporting manager to generate the permit for leaving the site. Without this permit field engineers are not allowed to leave the site.

4.9. Important Aspects

a)   For maintenance and supervision, a service engineer shall be deputed at District level.

b)   Service provider will perform the preventive maintenance of AWS/ARGs, before, during and after the onset of Monsoons, this would be mandatory and, part of routine check.

c)   Response time, for emergency maintenance shouldn't be more than 3 days, in any case. SLA shall be followed.

d)   Government of India or respective state government should be provided access to online maintenance logs on a web portal for the maintenance of AWS.

Quality Control and Quality Assurance - Data Validation and Generation of Quality Flags

1.   Quality Control, Quality Assurance and Errors

1.1.   Quality Control (QC)

The operational techniques and activities that are used to fulfil requirements for quality. The primary purpose of quality control of observational data is missing data detection, error detection and possible error corrections in order to ensure the highest possible reasonable standard of accuracy for the optimum use of these data by all possible users.

To ensure this purpose (the quality of AWS data), a well-designed quality control system is vital. Effort shall be made to correct all erroneous data and validate suspicious data detected by QC procedures. The quality of AWS data shall be known.

1.2.   Quality Assurance (QA)

All the planned and systematic activities implemented within the quality system, and demonstrated as needed, to provide adequate confidence that an entity will fulfil requirements for quality. The primary objective of the quality assurance system is to ensure that data are consistent, meet the data quality objectives and are supported by comprehensive description of methodology.

1.3.   Types of Errors

There are several types of errors that can occur in case of measured data and shall to be detected by implemented quality control procedures. They are as follows:

1.3.1. Random errors are distributed more or less symmetrically around zero and do not depend on the measured value. Random errors sometimes result in overestimation and sometimes in underestimation of the actual value. On average, the errors cancel each other out.

1.3.2. Systematic errors on the other hand, are distributed asymmetrically around zero. On average these errors tend to bias the measured value either above or below the actual value. One reason of random errors is a long-term drift of sensors.

1.3.3. Large (rough) errors are caused by malfunctioning of measurement devices or by mistakes made during data processing; errors are easily detected by checks.

1.3.4. Micrometeorological (representativeness) errors are the result of small-scale perturbations or weather systems affecting a weather observation. These systems are not completely observable by the observing system due to the temporal or spatial resolution of the observing system. Nevertheless, when such a phenomenon occurs during a routine observation, the results may look strange compared to surrounding observations taking place at the same time.

2.   Basic Quality Control (B-QC) Procedures

2.1.   Automatic data validity checking (basic quality control procedures) shall be applied at an AWS/ARG to monitor the quality of sensors data prior to their use in computation of weather parameter values. This basic QC (B-QC) is designed to remove erroneous sensor information while retaining valid sensor data. In modern automatic data acquisition systems, the high sampling rate of measurements and the possible generation of noise necessitate checking of data at the level of samples as well as at the level of instantaneous data.

2.2.   B-QC procedures shall be applied (performed) at each stage of the conversion of raw sensor outputs into meteorological parameters. The range of B-QC strongly depends on the capacity of AWS. processing unit. The outputs of B-QC would be included inside every AWS BUFR message.

2.3.   The types of B-QC procedures are as follows:

- **Automatic QC of raw data** (sensor samples) intended primarily to indicate any sensor malfunction, instability, interference in order to reduce potential corruption of processed data; the values that fail this QC level are not used in further data processing.

- Automatic QC of processed data intended to identify erroneous or anomalous data. The range of this control depends on the sensors used.

2.4.   All AWS/ARG data shall be flagged using appropriate QC flags. At B-QC five data QC categories are enough:

6.   good (accurate; data with errors less than or equal to a specified value);

2.   inconsistent (one or more parameters are inconsistent);

3.   doubtful (suspect);

4.   erroneous (wrong; data with errors exceeding a specified value);

5.   missing data.

2.5.   It is essential that data quality is known and demonstrable; data must pass all checks in the framework of B-QC. In case of inconsistent, doubtful and erroneous data, additional information should be transmitted; in case of missing data the reason of missing should be transmitted.

2.6.   Automatic QC of raw data

2.6.1.   Plausible value check and Range Check (Rate of Change)

After each signal measurement the current sample shall be compared to the preceding one. If the difference of these two samples is more than the specified limit, then the current sample is identified as suspect and not used for the computation of an average. However, it is still used for checking the temporal consistency of samples. It means that the new sample is still checked with the suspect one. The result of this procedure is that in case of large noise, one or two successive samples are not used for the computation of the average.

In case of sampling frequency six samples per minute (a sampling interval 10 seconds), the limits of time variance of the samples implemented at AWS/ARG can be as follows:

- Air temperature   : 2 C
- Dew-point temperature   : 2 C
- Relative humidity   : 5 %
- Atmospheric pressure   : 0.3 hPa
- Wind speed   : 20 m/s

There should be at least 66% (2/3) of the samples available to compute an instantaneous (one minute) value; in case of the wind direction and speed at least 75 % of the samples to compute a 2 or 10-minute average. If less than 66% of the samples are available in one minute, the current value fails the QC criterion and is not used in further computation of a relevant parameter; the value should be flagged as missing.

2.7.   Automatic QC of processed data

2.7.1.   Plausible value check

All the measured (recorded) values of the parameters from the sensors must be within acceptable range of limits. Limits of different meteorological parameters depends on the climatological conditions of AWS/ARG site and on season. At this stage of QC, they can be independent of them and they can be set as broad and general. Possible fixed-limit values implemented at an AWS/ARG can be as follows:

- Air temperature : -10 °C to 50 °C
- Dew-point temperature : 10 °C to 35 °C
- Relative humidity : 0% to 100 %
- Atmospheric pressure : 500 hPa to 1100 hPa
- Wind speed : 0 to 75 m/s
- Wind direction : 0 to 360 degrees.
- Precipitation amount : 0 to 40 mm (1-minute interval)

If the value is outside the acceptable range limit it should be flagged as erroneous.

2.7.2. Temporal consistency /variability/step check

If the current instantaneous value differs from the prior one by more than a specific limit (step), then the current instantaneous value fails the check, and it should be flagged as doubtful (suspect).

Table 4: Possible limits of a maximum variability in data errors:

Parameter	Limit for suspect (In extreme meteorological circumstances, unusual variability may occur. In such circumstances, data may be flagged as suspect, though being correct)	Limit of erroneous data
Air temperature	2 °C	
Relative humidity	10 %	15 %
Atmospheric pressure	0.5 hPa	2 hPa
Wind speed (2-minutes average)	10 m/s	20 m/s

If the following condition is not fulfilled, then the current instantaneous value fails the check.

$$|V_i - V_{i-1}| + |V_i - V_{i+1}| \leq 4\sigma V$$

where,

V_i is the current value of the parameter,

V_{i-1} is the previous value of the parameter,

V_{i+1} is the next value of the parameter,

σV is the standard deviation of the parameter calculated at least from the last 10- minute period.

If the previous value or the next one is missing, the corresponding part of the formula is omitted and the comparison term is $2 \cdot \sigma V$.

2.7.3. Persistence test

During a certain period (a persistence test), once the measurement of the parameter has been done for at least 60 minutes. If the one-minute values do not vary over the past 60/120/240 minutes by more than the specified limit (a threshold value) then the current one-minute value fails, the check.

Possible limits of minimum required variability can be as follows:

- Air temperature : 0.1°C over the past 60 minutes.
- Dew point temperature : 0.1°C over the past 60 minutes.
- Relative humidity : 1% over the past 60 minutes (Only if the measurement relative humidity is less than 95% to take into account uncertainty)
- Wind direction : 10 degrees over the past 60 minutes (Only if 10 minute average wind speed during the period is larger than 0.1 m/s)
- Wind speed : 0.5 ms-1 over the past 60 minutes (Only if 10-minute average wind speed during the period is larger than 0.1 m/s)

If the value fails, the time consistency checks it should be flagged as doubtful (suspect).

A calculation of a standard deviation of basic variables such as temperature, pressure, humidity, wind at least for the last one-hour period is highly recommended. If the standard deviation of the parameter is below an acceptable minimum, all data from the period should be flagged as suspect. In combination with the persistence test, the standard deviation is a very good tool for detection of a blocked sensor as well as a long-term sensor drift.

3. **Extended quality control procedure**

3.1. **Internal consistency test**

Internal consistency of data is based on the relation between two parameters.

The following conditions shall be true

- dew point temperature ≤ air temperature.
- wind speed = 00 and wind direction = 00
- wind speed ≠ 00 and wind direction ≠ 00
- wind gust (speed) ≥ wind speed

The wind information is considered to be erroneous and flagged in the following cases:

- wind direction = 00 and wind speed ≠ 00
- wind direction ≠ 00 and wind speed = 00
- wind gust (speed) ≤ wind speed

The temperature information is considered to be erroneous and flagged in the following case

- dew point temperature > air temperature

The precipitation information is considered to be erroneous and flagged in the following case

- Precipitation recorded but no sudden change in temperature (decrease) and humidity (increase)

Undertaking Letter for empanelment of an agency as WINDS Implementation partner (WIP)
[On the letter head of the Agency]

UNDERTAKING LETTER

Date: <DD/MM/YYYY>

To,
The Director,
Mahalanobis National Crop Forecast Centre,
Sahyadri Ave, Near Krishi Vistar Sadan,
Pusa, Pusa, New Delhi - 110012

Dear Sir,

Sub: Undertaking for Empanelment as WINDS Implementation Partner (WIP)

Having examined the Expression of Interest (EOI) documents including all annexure the receipt of which is hereby duly acknowledged, we, the undersigned, offer to provide the services as mentioned in EOI document in conformity with the said EOI document and the WINDS Manual 2023, as amended from time to time.

A. We understand that the EOI document provides generic specifications about all the items, and it has not been prepared by keeping in view any specific agency. We have verified and duly accept the eligibility criteria for this EOI.

B. We have read, understood and accepted the terms/ conditions/ rules mentioned in the EOI document and the WINDS Manual 2023, as amended from time to time.

C. We undertake that in competing for and if the award is made to us, in executing the subject EOI, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".

D. We are not blacklisted currently by any Government or its bodies, nor debarred currently from dealing with any company or public entity.

E. We undertake to carry out the work, if selected, as per WINDS Manual 2023, as amended from time to time.

F. We hereby certify that we have submitted the following documents in the requested format along with this undertaking:

   1. Annexure A: Certificates of past experience in similar work.

   2. Annexure B: Proof of technical capacity and experience: The applicant must have installed, calibrated, maintained more than 1000 AWS/ARG sites, including siting, sensors and other equipment, in the last 3 years.

   3. Annexure C: The calibration certificate of the sensors, electronics and other equipment provided by manufacturer.

   4. Annexure D: Detailed power consumption of the sensors and power budget taking care of solar panel and battery efficiency and sufficient safety factor of the system for power consumption of the station for minimum 30 days on batteries without any charging.

   5. Annexure E: Details of qualifications of technical personnel available.

6. Annexure F: Certificate of Incorporation/ Registration of Agency/ Memorandum and Articles of Association/Partnership Deed/ Proprietorship Deed/ Declaration of Proprietorship etc. as the case may be.

7. Annexure G: Copy of Income Tax Return for the last three Financial Years.

8. Annexure H: Solvency Certificate

9. Annexure I: Audited accounts (Balance Sheet and Profit and Loss Account etc.) for the last three years.

10. Annexure J: Copies of work contracts (of similar services) of minimum 10 Crores per annum, from Government/Autonomous bodies/PSU, private entities for the last three out of five years, including satisfactory performance certificate, if any.

11. Annexure K: Acceptance Letter on Company's letterhead which should be filled, signed, and stamped/certified properly.

12. Annexure L: Copy of PAN/TAN card and CIN.

13. Annexure M: Letter of Authority/Power of Attorney/Board Resolution/any other document indicating unequivocable authority to sign and submit the EOI.

14. Annexure N: Declaration regarding compliance with the standards and technical specifications as mentioned in the WINDS Manual 2023.

G. We certify that we have provided all the information requested by the WINDS Committee in the format requested for. We also understand that the WINDS Committee has the exclusive right to reject this proposal in case the WINDS Committee is of the opinion that the required information is not provided or is provided in a different format. It is also confirmed that the information submitted is true to our knowledge and the WINDS Committee reserves the right to reject the offer if anything is found incorrect.

Place:
Date: <DD/MM/YYYY
<div align="right">**Seal and signature of the Agency**</div>

Advanced Encryption Standard (AES) specification for the encryption & decryption of electronic data, for data security and to prevent unauthorized access

Encryption of payload data (content inside data node)

Content inside data node of payload must be encrypted by AES with following algorithm. For reference, the AES algorithm tutorial and testing link is given below:

https://www.devglan.com/online-tools/aes-encryption-decryption

https://levelup.gitconnected.com/implementing-aes-encryption-in-node-js-and-c-from-scratch-6ee7b47ae6d4

The algorithm required two keys as mentioned below:

Encryption and decryptionKey (AES 256 CBC) = <ED9466BBE4B0C4EC9E6431693AXXXXXXX>

Text format = Hex

Encryption and decryption IV = 9493508806CXXXXXX

authToken = the authentication key

1. **Sample encryption and decryption code in C#**

```
using System; using System.IO;
using System.Security.Cryptography; using System.Text;
namespace Aes_Example
{
    class AesExample
    {
        public static void Main()
        {
            string original = "your string here";
            string decryptText = "decrypt text to check";
            const string Key = "Secret Key";
            const string IV = "IV String";
using (AesCryptoServiceProvider myAes = new AesCryptoServiceProvider())
{
             myAes.IV = UTF8Encoding.UTF8.GetBytes(IV);
            myAes.Key = UTF8Encoding.UTF8.GetBytes(Key);
            byte[] encrypted = Encrypt(original, myAes.Key, myAes.IV);
                    string hex = BitConverter.ToString(encrypted).Replace("-","");
            byte[] decryptbyte = StringToByteArray(decryptText);
            string roundtrip = Decrypt(decryptbyte, myAes.Key, myAes.IV);
}
}
```

```csharp
public static byte[] StringToByteArray(String hex)
{
        int NumberChars = hex.Length;
        byte[] bytes = new byte[NumberChars / 2];
        for (int i = 0; i < NumberChars; i += 2)
        bytes[i / 2] = Convert.ToByte(hex.Substring(i, 2), 16);
        return bytes;
}
static byte[] Encrypt(string plainText, byte[] Key, byte[] IV)
{
if (plainText == null || plainText.Length <= 0)
        throw new ArgumentNullException("plainText");
if (Key == null || Key.Length <= 0)
        throw new ArgumentNullException("Key");
if (IV == null || IV.Length <= 0)
    throw new ArgumentNullException("IV");
byte[] encrypted;
using (AesCryptoServiceProvider aesAlg = new AesCryptoServiceProvider())
{
aesAlg.Key = Key;
aesAlg.IV = IV;
ICryptoTransform encryptor = aesAlg.CreateEncryptor(aesAlg.Key, aesAlg.IV);
using (MemoryStream msEncrypt = new MemoryStream())
{
using (CryptoStream csEncrypt = new CryptoStream(msEncrypt, encryptor,
CryptoStreamMode.Write))
    {
        using (StreamWriter swEncrypt = new StreamWriter(csEncrypt))
        {
                swEncrypt.Write(plainText);
        }
                encrypted = msEncrypt.ToArray();
    }
    }
}
    return encrypted;
}

static string Decrypt(byte[] cipherText, byte[] Key, byte[] IV)
{
    if (cipherText == null || cipherText.Length <= 0)
        throw new ArgumentNullException("cipherText");
```

```
    if (Key == null || Key.Length <= 0)
        throw new ArgumentNullException("Key");
    if (IV == null || IV.Length <= 0)
        throw new ArgumentNullException("IV");
    string plaintext = null;
using (AesCryptoServiceProvider aesAlg = new AesCryptoServiceProvider())
    {
       aesAlg.Key = Key;
       aesAlg.IV = IV;
    ICryptoTransform decryptor = aesAlg.CreateDecryptor(aesAlg.Key, aesAlg.IV);
    using (MemoryStream msDecrypt = new MemoryStream(cipherText))
    {
     using (CryptoStream csDecrypt = new CryptoStream(msDecrypt,decryptor,Crypto
     StreamMode.Read))
    {
    using (StreamReader srDecrypt = new StreamReader(csDecrypt))
    {
plaintext = srDecrypt.ReadToEnd();
    }
  }
}
    }

return plaintext;
    }
  }
    }
```

2.   Sample encryption and decryption code in Java

```
import javax.crypto.Cipher;

import javax.crypto.SecretKey;

import javax.crypto.SecretKeyFactory;

import javax.crypto.spec.IvParameterSpec;

import javax.crypto.spec.PBEKeySpec;

import javax.crypto.spec.SecretKeySpec;

import java.nio.charset.StandardCharsets;

import java.security.spec.KeySpec;

import java.util.Base64;


public class Main {

private static final String SECRET_KEY = "Secrete Key";
```

```java
private static final String ivString = "IV string";

private static final byte[] keyParse = SECRET_KEY.getBytes();


public static String byteArrayToHexString(byte[] bytes)
{
  StringBuffer buffer = new StringBuffer();
  for(int i=0; i<bytes.length; i++)
{
  if(((int)bytes[i] & 0xff) < 0x10)
    buffer.append("0");
  buffer.append(Long.toString((int) bytes[i] & 0xff, 16));
}
return buffer.toString();
}
public static String encrypt(String strToEncrypt) {
try {
  byte[] iv = ivString.getBytes();
  IvParameterSpec ivspec = new IvParameterSpec(iv);
SecretKeyFactory factory =
SecretKeyFactory.getInstance("PBKDF2WithHmacSHA256");
    Cipher cipher = Cipher.getInstance("AES/CBC/PKCS5Padding");
    SecretKeySpec key = new SecretKeySpec(keyParse, "AES");
cipher.init(Cipher.ENCRYPT_MODE, key, ivspec);
return
byteArrayToHexString(cipher.doFinal(strToEncrypt.getBytes(StandardCharsets.UTF_8)));
    } catch (Exception e) {
    System.out.println("Error while encrypting: " + e.toString());
    }
    return null;
    }
    public static String decrypt(String strToDecrypt) {
try {
  byte[] iv = ivString.getBytes();
  IvParameterSpec ivspec = new IvParameterSpec(iv);


  Cipher cipher = Cipher.getInstance("AES/CBC/PKCS5PADDING");
```

```java
SecretKeySpec key = new SecretKeySpec(keyParse, "AES");
cipher.init(Cipher.DECRYPT_MODE, key, ivspec);


byte[] val = new byte[strToDecrypt.length() / 2];
for (int i = 0; i < val.length; i++) {
int index = i * 2;
int j = Integer.parseInt(strToDecrypt.substring(index, index + 2), 16);
val[i] = (byte) j;
}
return new String(cipher.doFinal(val));
} catch (Exception e) {
System.out.println("Error while decrypting: " + e.toString());
}
return null;

}
```

3. **Sample encryption and decryption code in Javascript**

```javascript
var crypto = require('crypto');
const encryptionType = 'aes-256-cbc';
const encryptionEncoding = 'hex';
const bufferEncryption = 'utf-8';
module.exports = {
encrypt: (text, eskey, esIv ) => {
const key = Buffer.from(eskey, bufferEncryption);
const iv = Buffer.from(esIv, bufferEncryption);
const cipher = crypto.createCipheriv(encryptionType, key, iv);
let encrypted = cipher.update(text, bufferEncryption, encryptionEncoding);
encrypted += cipher.final(encryptionEncoding);
return encrypted;
},
decrypt: (encrypted, eskey, esIv) => {
const buff = Buffer.from(encrypted, encryptionEncoding);
const key = Buffer.from(eskey, bufferEncryption);
const iv = Buffer.from(esIv, bufferEncryption);
const decipher = crypto.createDecipheriv(encryptionType, key, iv);
```
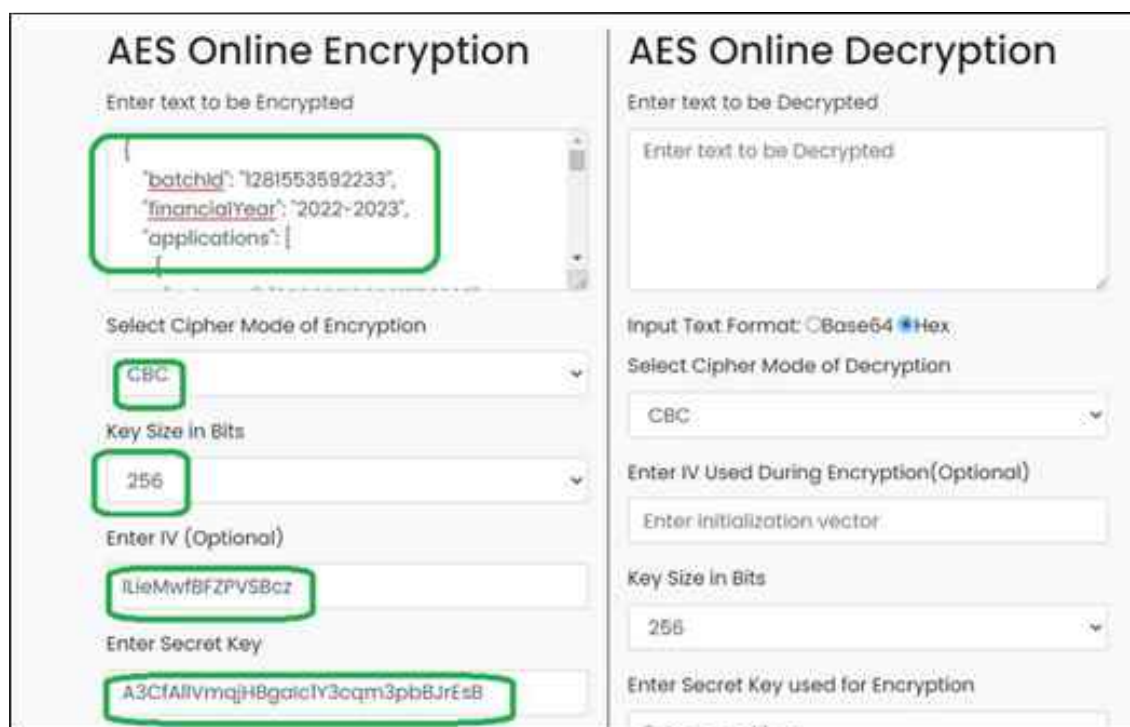
```
const deciphered = decipher.update(buff) + decipher.final();
return deciphered;
}
    }
```

4. **Online utility to encrypt/decrypt the request**

    This utility is only for reference purpose for the bank teams to match the encrypted and decrypted text.

    a.   Get the IV & Secret Keys

    b.   Enter the details under "AES Online Encryption"

    c.   Enter the "data" node" from the Main Request under "Enter text to be Encrypted" field

    d.   Select "CBC" from "Select Cipher Mode of Encryption" field

    e.   Select "256" from Key Size in Bits" field

    f.   Enter the IV Key under "Enter IV (Optional)" field

    g.   Enter the Secret key under "Enter secret key" field

    h.   Select the "Output Text Format" as "Hex" and Click on "Encrypt" button and verify that the Request Is Encrypted successfully and displayed under "AES Encrypted Output"

Get the Encrypted Output and Put in the Body for "Submit Batch request" in POST MAN Tool

Submit the Request and verify that response is received in encrypted form from POST MAN Tool

Submit the Request and verify that response is received in encrypted form from POST MAN Tool

5. Decrypting the Text

a. Enter the below details under "AES Online Decryption" section

b. Get the Text from POST MAN and put under "Enter the Text to Decrypt" field

c. Select "Hex" radio button under "Input Text format"

d. Select "CBC" from "Select Clipher Mode of Decryption" Dropdown

e. Enter the IV Key under "Enter IV User During Encruption(Optional) field

f. Enter the Secret key under "Enter secret Key user for Encryption) field

g. Click on Decrypt button and verify the Text is Decrypted successfully

h. Click no "Decode to Plain Text" button and verify the Text is Decoded into plain text successfully

SECTION 2
Model Tender Document

Model Tender Document

Selection of

WINDS Implementation Partners (WIP)

for setting up of

Automatic Weather Station (AWS) at Block/Tehsil/Taluk level

and

Automatic Rain Gauge (ARG) at Gram Panchayat (GP)

<DD/MM/YYYY>

Note:

The points incorporated in Model Tender Document are suggestive and respective States/UTs may kindly modify this as per applicability of related rules in the concerned States/UTs

Tender Notice

Selection of WINDS Implementation Partners (WIP) to set up network of Automatic Weather Station (AWS) at Block/ Tehsil/Taluk level and ARG at Gram Panchayat (GP) level

The Department of <Name of Department>, Government of <Name of State/UT> invites quotations from experienced agencies for installation of Automatic Weather Station (AWS) at Block/ Tehsil/Taluk level and ARG at Gram Panchayat (GP) level under WINDS in the State/UT of <State/UT name>.

All empanelled agencies are mandated to get enrolled on <Website> in order to download the tender documents and participate in the subsequent bidding process.

The Tender Document can be uploaded online on <website> and copies can be sent through email to <email-ID>

<div align="right">

<Authorized signatory >
<Department name, address>

</div>

Bid Schedule

Particulars	Details
Assignment Name	Selection of WINDS Implementation Partners (WIP) to set up network of Automatic Weather Station (AWS) at Block/Tehsil/Taluk level and ARG at GP Level
Tender Reference No	[Insert tender reference no.]
Bid Submission Mode	As per the Financial Rules in the State
Date of Issue of Tender Document	DD / MM / YYYY
Date & time for Pre-Bid Meeting if required (at least one week before tender submission date)	DD / MM / YYYY at HH:MM
Pre-Bid Meeting Venue	Address: ....
Last Date for submission of queries/ clarifications	DD/MM /YYYY at HH:MM
Last Date for Submission of tender	DD / MM / YYYY at HH:MM
Date and time of tender opening	DD / MM / YYYY at HH:MM
Issue of Notification of Award (NOA)	Within <No of Days> working days of financial bid opening
Acceptance of Notification of Award	Within 2 working days of the issue of NOA

1. INTRODUCTION

1.1. Background

This tender document is for obtaining services of reputed empanelled technical/research agencies for installation of Automatic Weather Station (AWS) at Block/ Tehsil/Taluk level and Automatic Rain Gauge (ARG) at Gram Panchayat (GP) level as per the WINDS Manual 2023, as amended from time to time. Presently, services are required for installation of Automatic Weather Station (AWS) at Block/ Tehsil/Taluk level and ARG at Gram Panchayat (GP) level in <number of districts> in <Name of the State/UT> state.

In case any difference is found in interpretation or reference of terms & conditions and various provisions as mentioned in the Tender document, the terms & conditions and provisions of the WINDS Manual 2023, as amended from time to time, shall be final and binding in all situations to all stakeholders.

2. Submission of Bids

2.1. The Bidders should submit their financial bids along with the EMD, Annexures, Certificates and other required documents as stated in the tender document, in the prescribed mode as per the Financial Rules prevailing in the State. In case the bids are submitted physically, the same shall be submitted in sealed envelopes in the following manner:

    a. All signed Annexures, documents for EMD, should be submitted in an envelope superscribed as:

    "All signed Annexures, documents for EMD for tender document Ref:_____(Doc Number), For Selection of WIP for WINDS Implementation

    SUBMITTED BY   (Bidder's Name)"

    b. Financial Bid – Hardcopy for the Financial Bid should be in a separate sealed envelope super- scribed as:

    "Financial BID for tender document Ref: _____ (Document number)" dated <DD/MM/YYYY>, For Selection of WIP for WINDS Implementation.

    SUBMITTED BY   (Bidder's Name)"

2.2. All the envelopes should clearly indicate the name, address, telephone number, E-mail ID of the bidder.

2.3. The hardcopies of the bid (all documents and Annexures submitted as a part of bid or called for by the State) must be duly signed on each page and stamped on each page. Bid shall be signed by the Bidder, or a person duly authorized to bind the Bidder to the Agreement. Authorization by the bidder for the signatory shall be in form of a Power of Attorney or a duly certified copy of the Board resolution appointing the authorized signatory or authority letter issued by the competent authority. The person signing the bid shall sign all pages of the bid, except for un-amended printed literature.

2.4. Any bid received after the due date and time for receipts of bids as prescribed in this Tender document will not be considered and returned unopened to the bidder.

2.5. The Online submission of bids along with uploading of all the documents shall be made on <name of the website/portal>. The hard copies of the documents, if required by the State/UT along with the EMD shall be submitted to the address specified in this Tender document before the last date of submission of bids.

2.6. The Bidders may submit their queries or seek clarifications through email before the last date for submission for queries as specified in the schedule. A clarification to the queries shall be provided to the bidders and the same shall be published on the website.

3.   **Eligibility criteria for Bidders**

The bidders which are empanelled by the WINDS committee as WIPs shall only be eligible to participate in the Tender called by the State/UT of <Name of the State/UT> for implementation of WINDS.

4.   **Financial Bid:**

State/UT of <Name of the State/UT> has called for financial bid from empanelled WIPs only. The WIP quoting the lowest rates shall be declared as L1 on the basis of Least Cost System and work shall be awarded to such L1. The decision of the State shall be final and binding on all the Bidders.

5.   **Criteria for work**

The Selected WIP (L1 Bidder) shall implement WINDS as per the WINDS Manual 2023, as amended from time to time.

6.   **Information/documents to be provided**

6.1. The Bidders shall submit the following documents in response to this tender document:

   a. Integrity pact as per Annexure II

   b. An Undertaking on the WIP's letterhead along with requisite documentary proofs. The format of the undertaking is provided in Annexure III.

   c. Duly sealed/encrypted Financial Bid as per IV.

   d. Non-Disclosure Agreement (NDA) as per Annexure V.

   e. List of deliverables as per Annexure VI.

   f. Tender Terms & Conditions Acceptance/Bid Cover Form as per Annexure VII.

   g. Any other document required as per the <Name of the State/UT> Government tender notification.

6.2. The aforementioned documents must be correctly scanned so that they are clearly readable and intelligible since otherwise, the tender document may become technically unresponsive. The documents should be organized precisely in the above order and page-numbered, with an index at the front that lists each document's page number.

7.   **EMD/BID security**

7.1. Bidders, except those who are registered with the Central Purchase Organization, National Small Industries Corporation (NSIC), shall have to furnish, as part of bid, an EMD/bid security from 1% to 5% (as per the prevailing financial riles of the State/UT Government) of the project value in the form of either an account payee NEFT/RTGS/IMPS Demand Draft, Fixed Deposit receipt, Banker's Cheque, Insurance Surety Bonds or Bank Guarantee from any Indian Commercial Bank in favour of <addressing authority> <address> valid for a period of 45 days beyond the final tender validity period and shall be delivered physically on or before the last date and time fixed for tender document submission.

7.2. The MSME and startups having valid registration certificate of the appropriate authority shall be exempted from submission of EMD, wherever applicable as per relevant rules.

7.3. The Tender Document not accompanied by EMD/Bid Security shall be rejected being non-responsive at the bid opening stage and returned to the bidder unopened.

7.4. The bid security of the unsuccessful bidder will be discharged /returned to the bidder on or before the 30th day after the award of the work order and submission of performance security by the successful bidder.

7.5. The successful bidder's bid security will be discharged upon the bidder's acceptance of the notification of award and furnishing the performance security.

7.6. The bid security may be forfeited:

    a. If a bidder withdraws his bid during the period of bid validity specified above.

    b. In the case of a successful bidder, if the bidder withdraws or amends the tender document or impairs or derogates from the tender document.

    c. In case of the successful bidder, if the bidder fails to sign the Agreement within the stipulated timelines.

    d. In case successful bidder fails to submit the performance security, within the stipulated timelines.

8. Performance Review:

The performance evaluation of the WIP shall be done as per the Monitoring and Evaluation (M&E) framework, as described in the WINDS Manual 2023, as amended from time to time.

9. Performance Security

9.1. The Performance Security shall be 5% to 10% (as per the prevailing financial riles of the State/UT Government) of the cost of the project for 5 years and shall be submitted within 15 days of signing of the Agreement.

9.2. The amount of performance security may be paid through Account Payee DD/Fixed Deposit Receipt (FDR)/ Bank Guarantee (PBG)/Insurance Bonds in favour of "Pay & Accounts …………………………………".

9.3. The performance security shall be valid for at least 60 (Sixty) days beyond the completion of the period of Agreement and shall be denominated in Indian rupees payable at _____, India issued by a scheduled bank in India through its branch in _____, India.

9.4. The performance security shall be discharged by <issuing Organization name/authority and address> and returned to the WIP within 60 days from the date of final certificate, certifying the fulfilment of the performance obligations under this Tender Document. However, it is clarified that the performance security shall be interest free.

10. Notification of Award

10.1. The notification of award shall be issued to the successful bidder (L1) within 5 working days from date of bid opening whereafter, the successful bidder shall accept the award within 2 working days.

10.2. The acceptance of the Bid based on Least Cost System (LCS), will be communicated by way of placing a notification of award in writing at the address supplied by the Bidder in the Bid document and/or on the <website>. Any change of address of the Bidder should therefore be notified promptly to the State Government at the address given in this tender document.

10.3. The Successful Bidder shall be required to enter into an Agreement as per the draft Agreement with the State/UT, within 15 working days of the award of the work. This Agreement shall be based on this tender document, the WINDS Manual 2023, as amended from time to time, and such other terms and conditions as may be determined by <Name of State/UT> to be necessary for the due performance of the work, as envisaged herein and in accordance with the Bid.

10.4. In case L1 withdraws its bids, or fails to sign the Agreement, the State Government may take appropriate action as per the prevailing financial rules including re-tender.

11. Financial Bid

11.1. The financial Bid should be submitted in soft copy (signed and scanned) & in the financial bid format as per Annexure IV on the E-tendering portal. In case of physical submission, the financial bid shall be submitted in a sealed enveloped superscribed as "Financial Bid for WINDS"

11.2. The rates quoted by the Bidder shall be inclusive of all expenses and taxes excluding GST. The bidder quoting the lowest rates shall be selected as L1 bidder for award for work order. In case of tie between the bidders, the State/UT shall follow their relevant financial rules for selection of the L1 bidder.

11.3. If there are any corrections in the Bid document, the authorized signatory should initial them all, failing which the figures for such item shall not be considered. Discrepancies in Bids will be corrected as follows:

1. Where there is a discrepancy between the amounts in figures and in words, the amount in words shall prevail.

2. If there is a discrepancy between percentage and amount, the amount calculated as per the stipulated percentage basis shall prevail.

3. Where there is a discrepancy between the unit rate and the line-item, total resulting from multiplying the unit rate by the quantity, the unit rate will govern unless, in the opinion of Government of <name of State/UT>, there is an obvious error such as rounding offer, misplacement of a decimal point etc., in which case the line-item total will prevail.

4. Where there is a discrepancy between the amount mentioned in the Bid and the line-item, total present in the schedule of prices, the amount obtained on totalling the line items in the Financial Bid will prevail.

5. In case, the bidder does not accept the correction of the errors as stated above, the Bid shall be rejected.

11.4. The financial bid shall be submitted as per the format and the same will be evaluated on Least Cost System (LCS) Basis. The formats and illustrations for preparation and submission of financial bids are provided in the tables below.

12. Schedule of Requirement

Government of <Name of the State/UT> will collect the real time weather data from the network of AWS/ARG set up under WINDS with effect from <DD/MM/YYYY> The following are the schedule of requirements of data supply.

S. No.	AWS/ARG	Quantity	Data supply schedule
1	Handing over of sites for AWS/ARG	XXXX sites	One Month from award of work
2	Commissioning of AWS and Mirror Server.	XXXXX sites	Three months after handing over the sites

13. Scope of work

The WIP selected by <Name of the State/UT> for implementation of WINDS, shall comply with the scope as defined in the WINDS Manual 2023, as amended from time to time.

13.1. Supply of uninterrupted real time quality weather data after Installation of Automatic Weather Stations with following components:

- Air Temperature

- Relative Humidity

- Wind Speed & Direction

- Rainfall Sensor: Rain Gauge (Precipitation)

- Data Logger & Power Unit

- Communication Unit & Server

- Civil & Fencing Work

13.2. Supply of uninterrupted real time quality weather data for the Agreement period and maintenance of entire AWS/ARG network which includes regular calibration, maintenance and replacement of AWS/ARG site, sensors, equipment and other accessories.

13.3. Establishment of Mirror Server at designated <Name of the State/UT> Data Centre (SDC) with uninterrupted power back to receive validated & processed real-time weather data from all the AWSs commissioned under the project in the <Name of the State/UT> and for maintaining an identical instance of data as available on the WINDS portal.

14. AWS/ARG – Installation, Calibration, Maintenance, Validation, Data Transmission and Validation

The WIP shall comply with the guidelines and protocols for installation of AWS/ARG network under WINDS, data transmission quality control and quality assessment procedures, data storage, and data dissemination, as per the WINDS Manual 2023, as amended from time to time.

15. Payment Terms

The Department shall release funds for implementing WINDS to WIP as per the Payment Terms mentioned in the WINDS Manual 2023, as amended from time to time.

Payment Terms & Timeline		
Instalment	**Description**	**Release Timeline**
1st	Advance 20% of the procurement cost of weather data for Five-year tender cycle.	Within 15 working days after the award of the work order
Subsequent (Quarterly from the 3rd Quarter Onwards	On Actuals against quality-verified data as per WINDS portal. The advance paid in the first tranche will be amortized across 18 equal instalments which will be adjusted from the quarterly invoice at the time of payment.	After the submission of Quarterly Invoices

16. Penalty Clause:

16.1. Selected WIPs shall comply with the guidelines in this manual and the instructions issued by the Government from time to time. Non-compliance to guidelines shall attract penalty.

16.2. Penalty will be imposed on the WIPs based upon the Service Level Agreement (SLA) indicators of compliance to specifications, timelines and data quality.

16.3. Delay in commissioning of AWS/ARG from stipulated timelines

The liquidated damage shall be 0.5% of procurement cost of weather data for the agreement period for delayed commissioning of AWS/ARG per week or part thereof, on pro-rata basis. The maximum amount of liquidated damages shall be 10% of the procurement cost of weather data for the agreement period.

16.4. Missing/Erroneous Weather Data

• Missing of any of the weather parameters in a given day for a given AWS/ARG station shall be considered as erroneous data and no rental cost for such AWS/ARGs for the day shall be payable.

• A penalty upon per day data rental cost of AWS and ARG respectively shall be levied for each day of erroneous/missing data irrespective of number of weather parameters. Thereafter, the penalty shall increase gradually with each day of continuous erroneous/missing data.

• However mobile data network failure due to unforeseen circumstances, such as natural calamities, vandalization, etc., will be excluded while calculating the period of failure.

o The penalty shall be calculated on the basis of the yearly rental cost of the AWS and ARG station data and an illustration is provided in the table below:

Table:

Penalty Clause		
S No.	No. of Days or part thereof beyond Timeline	Penalty (Percentage of Yearly rental cost of the AWS and ARG station data
1	Up to 3 Days	0.00%
2	4	0.50%
3	5	0.50%
4	6	0.50%
5	7	1.00%
6	8	1.50%
7	9 and more	2.00%

AN illustration of the penalty clause is provided in table below

Table: Penalty Clause Illustration

	Monthly Rental Cost (in Rs.)	3520	
	Yearly Rental Cost (in Rs.)	42240	
S No.	No. of Days or part thereof beyond Timeline	Penalty (Percentage of Yearly rental cost of the AWS and ARG station data	Penalty Amount (in Rs.)
1	Up to 3 Days	0.00%	0
2	4	0.50%	211
3	5	0.50%	211
4	6	0.50%	211
5	7	1.00%	422
6	8	1.50%	634
7	9 and more	2.00%	845

17. General Terms

17.1. The Agreement with the successful bidder shall be governed in accordance with the laws of India for the time being in force and will be subject to the exclusive jurisdiction of Courts at <name of the State> (with the exclusion of all other courts).

17.2. The duration of Agreement shall be for a period of 60 Months (5 years), starting from <DD/MM/YYYY> to <DD/MM/YYYY>, further extendable for a period of 2 Years, as per the relevant provisions of the WINDS Manual 2023, as amended from time to time.

17.3. The State/UT reserves the right to terminate the Agreement as per termination of Agreement clause of the WINDS Manual 2023, as amended from time to time, if the work is not proceeding in accordance with the terms of Agreement or the WINDS Manual 2023, as amended from time to time, without prejudice to its right to claim liquidated damages.

17.4. At all times during implementation, successful bidder needs to adhere to required compliances under the WINDS Manual 2023, as amended from time to time, vis-à-vis security, confidentiality, integrity, and availability and also any guidelines by any regulatory/ government agency on the same.

17.5. Except with the prior written consent of the State/UT Government, the Successful Bidder and its Personnel shall not at any time communicate to any person or entity any confidential information acquired in the course of the Services, nor shall the Successful Bidder and its Personnel make public the recommendations formulated in the course of, or as a result of, the Services. For this purpose, the successful bidder shall execute a Non-disclosure Agreement (NDA) as per Annexure V.

17.6. Neither the Agreement nor any rights granted under the Agreement may be sold, leased, assigned, sublet or otherwise transferred, in whole or in part, by the bidder, and any such attempted sale, lease, assignment or otherwise transfer shall be void and of no effect whatsoever.

17.7. <Name of the State/UT> Government reserves the right to cancel in full or part of the tender at any stage of the tendering process and can go for Re-Tendering or even extend the Cut-off date for submitting the Bids without assigning any reason thereof.

17.8. <Name of the State/UT> Government reserves the right to alter the requirements specified in the Tender Document. <Name of the State> also reserves the right to delete one or more items from the list of items specified in the tender document. <Name of the State/UT> Government will inform all bidders about changes, if any.

17.9. Any subject matter not dealt with herein shall be governed by the WINDS Manual 2023, as amended from time to time, and in case of any discrepancy between the tender document, the Agreement and the WINDS Manual 2023, the provisions of WINDS Manual 2023, as amended from time to time, shall prevail and be binding upon all the Parties.

Annexure I

Provisional list of Blocks/Tehsils/Taluks for installation of AWS and list of Gram Panchayats (GPs) for ARG installation along with the name of the Winds Local Guardian (WLG)

(List of Blocks selected for AWS installation is attached as a separate file along with the TENDER document and bidders are requested to download it)

[On the Letter Head of the WIP]

INTEGRITY PACT

Between

Department of (Name of Department) of Government of (Name of State)
hereinafter referred to as "The Principal"

and

M/s <Name of Technology Implementing Partner (WIP)

> hereinafter referred to as "The Bidder".

Preamble

The Principal intends to engage Agency, under laid down organizational procedures, for implementation of WINDS in <name of the State/UT>. The Principal values full compliance with WINDS Manual 2023, as amended from time to time, and all relevant laws of the land, rules, regulations, economic use of resources and of fairness / transparency in its relations with its Bidder(s).

In order to achieve these goals, the Principal has appointed <Name of the Authority/Contract Management Committee> who will monitor the Bid process and the execution of the Agreement for compliance with the Principal mentioned above.

Section 1 – Commitments of the Principal

1. The Principal Commits itself to take all measures necessary to prevent corruption and to observe the following principles: -

    a. No employee of the Principal, personally or through family members, will in connection with the Tender for, or the execution of a Agreement, demand, take a promise for or accept, for self or third period, any material or immaterial benefit which the person is not legally entitled to.

    b. The Principal will, during the Tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the Bid process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential /additional information through which the Bidder(s) could obtain an advantage in relation to the Bid process or the execution of Agreement.

    c. The Principal will exclude from the process all known prejudiced persons.

2. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC / PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer/appropriate authority and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)

1. The Bidder(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Bid process and during the Agreement execution.

a. The Bidder(s) will not directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the Tender process or the execution of the Agreement or to any third person any material or other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Agreement.

b. The Bidder(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

c. The Bidder(s) will not commit any offence under the relevant IPC / PC Act, further the Bidder(s) will not use improperly, for purposes of competitive or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d. The Bidder(s) of foreign origin shall disclose the name and address of the Agents / representatives in India, if any. Similarly, the Bidder(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s). Further, as mentioned in the Guidelines all the payments will be made in Indian Rupees Only.

e. The Bidder(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the work order.

f. Bidder(s) who have signed the Integrity Pact shall not approach the Courts while representing the matter to <Name of the Authority/Contract Management Committee> and shall wait for their decision in the matter.

2. The Bidder(s) will not instigate third persons to commit offences outlined above or be an accessory to the offences.

Section 3 – Disqualification from Bid process and exclusion from future Contracts

If the Bidder(s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s) from the Tender process or take action as per the procedure mentioned in the "Guidelines on Banning of business dealings".

Section 4 – Compensation for Damages

1. If the Principal has disqualified the Bidder(s) from the Tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit / Bid Security.

2. If the Principal has terminated the Agreement according to Section 3, or if the Principal is entitled to terminate the Agreement according to Section3, the Principal shall be entitled to demand and recover from the WIP liquidated damages as per the WINDS Manual 2023.

Section 5 – Previous transgression

1. The Bidder declares that no previous transgressions occurred in the last 3 years with any other Company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the Tender process.

2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken as per the procedure mentioned in "Guidelines on Banning of business dealings".

Section 6 – Equal treatment of all Bidders

1. The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.

2. The Principal will disqualify from the Tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidder(s)

If the Principal obtains knowledge of conduct of a Bidder, or of an employee or a representative or an associate of a Bidder, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer/appropriate authority.

Section 8 – <Name of the Authority/Contract Management Committee>/ Monitors

1. The Principal appoints competent and credible <Name of the Authority/Contract Management Committee> for this Pact after appropriate internal approvals. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. The Monitor would have access to all Agreement documents, whenever required. It would be obligatory for him/her to treat the information and documents of the Bidders as confidential. He reports to the _____, Government of <name of the State/UT>.

3. The Bidder(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Bidder. The Bidder will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation.

4. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s) with confidentiality. The Monitor has also signed declarations on Non-Disclosure of Confidential Information' and of 'Absence of Conflict of Interest'. In case of any conflict of interest arising at. Later date, the <Name of the Authority/Contract Management Committee> shall inform the _____, GOVERNMENT OF <NAME OF THE STATE/UT> and recuse himself/herself from that case.

5. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project, provided such meetings should have an impact on the contractual relations between the principal and the Bidder. The parties offer to the Monitor the option to participate in such meetings.

6. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he/she will so inform the Management of the principal and request the Management to discontinue or take corrective action, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

7. The Monitor will submit a written report to the _____, GOVERNMENT OF <NAME OF THE STATE/UT> within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposal for correcting problematic situations.

8. If the Monitor has reported to the _____, a substantiated suspicion of an offence under relevant IPC /PC Act, and the _____ has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer/Appropriate authority.

9. The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

The Pact begins when both parties have legally signed it. It expires for the Bidders 6 months after the Agreement has been executed. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings. If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by GOVERNMENT OF <NAME OF THE STATE/UT>.

Section 10 – Other provisions

1. This agreement is subject to Indian Law; Place of performance and jurisdiction is the Registered Office of the Principal i.e. <Nodal Department Headquarters>.

2. Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

3. If the Bidder is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

5. Issues like Warranty/Guarantee etc shall be outside the purview of <Name of the Authority/Contract Management Committee>.

6. In the event of any contradiction between the Integrity Pact and its Annexure, the clause in the Integrity Pact will prevail.

(For & On behalf of the Principal)   **(For & On behalf of Bidder)**

(Office Seal)   **(Office Seal)**

Place: _____

Date: <DD/MM/YYYY>

Witness 1:

(Name & Address)

Witness 2 :

(Name & Address)

[On the letter head of the WIP]

UNDERTAKING LETTER

To,   Date: <DD/MM/YYYY>

_____,

Department of Agriculture,

Government of <name of State/UT>

_____,

_____

Dear Sir,

Sub: Tender for Implementation of WINDS

Having examined the Tender documents including all annexures the receipt of which is hereby duly acknowledged, we, the undersigned, offer to provide the services as mentioned in Tender document in conformity with the said Tender documents and the WINDS Manual 2023 and in accordance with the financial bid.

A. We understand that the Tender document provides generic specifications about all the items, and it has not been prepared by keeping in view any specific bidder. We have ensured ourselves about the eligibility criteria before submitting the tender.

B. We have read, understood and accepted the terms/ conditions/ rules mentioned in the Tender document and the WINDS Manual 2023.

C. We undertake that in competing for and if the award is made to us, in executing the subject tender, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".

D. We certify that we are not blacklisted currently by any Government/ Ministry/Department/PSU nor debarred currently from dealing with any company/ public department.

E. We certify that we are registered with all Government /statutory authorities as required in the normal course of business to render similar services.

F. We understand that the Government of <name of the State/UT> is not bound to accept the lowest or any offer it may receive. We also understand that the whole bidding exercise may be scrapped without assigning any reason and it is acceptable to us.

G. Upon being selected as L1 bidder, we undertake to enter into an Agreement with the Government of <name of the State/UT> and submit the Performance Security within the timelines prescribed in the tender document. We undertake to comply all the terms and conditions of the tender document and the WINDS Manual 2023.

H. We undertake to carry out the Study and the work as per WINDS Manual 2023, as amended from time to time.

I. We understand that if we withdraw or modify our Bids during the period of validity, or if we are awarded the tender and we fail to submit the required performance security before the deadline defined in the request for bids document, we will be suspended for the period of three years from being eligible to submit Bids for tenders with Government of <name of the State/UT> and the

EMD shall be forfeited by Government of <name of the State/UT>.

J. We hereby certify that we have submitted the following documents in the requested format along with this undertaking:

1. Annexure A: A brief description of the agency's background mentioning the address of its registered head office, the address of the local office in India, contact no. (Mobile, landline, fax and email id), names of important persons who may be contacted etc.

2. Annexure B: Certificate of Incorporation/ Registration of Agency/ Memorandum and Articles of Association/Partnership Deed/ Proprietorship Deed/ Declaration of Proprietorship etc. as the case may be.

3. Annexure D: Copy of PAN, TAN and CIN.

4. Annexure E: Proof of Bid Security (EMD) of <Amount in Rs.>

5. Annexure F: Non-Disclosure Agreement

6. Annexure G: Letter of Authority/Power of Attorney/Board Resolution/any other document indicating unequivocable authority to sign and submit the bid.

7. Annexure H: Declaration regarding compliance with the standards and technical specification as mentioned in the WINDS Manual 2023, as amended from time to time.

b. We also understand that Government of <name of the State/UT> has the exclusive right to reject this offer in case Government of <name of the State/UT> is of the opinion that the required information is not provided or is provided in a different format. It is also confirmed that the information submitted is true to our knowledge and Government of <name of the State/UT> reserves the right to reject the offer if anything is found incorrect.

Place:

Date: <DD/MM/YYYY>   (Seal and signature of the authorized signatory of WIP)

FINANCIAL BID

[On the letter head of the WIP]

To,   Date: <DD/MM/YYYY>

_____,
Department of Agriculture,
Government of <name of State/UT>
_____,
_____

Dear Sir,

In terms of the TENDER document, we submit herewith the following financial bid:

Bidding Parameter	Financial Quote for tender period of <No. of > Months		
	Number of Units (To be filled by the State/UT)	**Per Unit Monthly Rental Cost (in INR)**	**Total Amount (in INR For tender period)**
	(A)	**(B)**	**(A x B x No. of Months in tender period)**
Cost for providing real time weather data per AWS per month (excluding taxes)			
Cost for providing real time weather data per ARG (without temperature sensor) per month (excluding taxes)			
Cost for providing real time weather data per ARG (with temperature sensor) per month (excluding taxes)			
Gross Total in figures			
Grand Total in Words			

(Attach Annexure VI regarding the list of deliverables.)

Note:

1. The final bid financial quote shall be the Grand Total of all three components for the duration of the tender cycle.

2. The rates quoted are inclusive of all items as mentioned in the scope of work and the deliverables mentioned in Annexure VI and all other charges including but not limited to travel, accommodation, mobilization charges, etc.

3. The quoted rates shall be exclusive of applicable taxes only.

4. Rates shall be quoted **without any overwriting, correction, error, omission, etc.** In case of discrepancy, the rates mentioned in the words will be taken for consideration.

5. Where there is a discrepancy between the unit rate and the line-item, total resulting from multiplying the unit rate by the quantity, the unit rate will govern unless, in the opinion of Government of <name of State/UT>, there is an obvious error such as rounding offer, misplacement of a decimal point etc., in which case the line-item total will prevail.

6. The rate quoted shall be up to maximum of two decimal points.

7. The financial bid shall be valid up to 90 days from the date of opening of the bid.

Place:

Date: <DD/MM/YYYY> (Seal and signature of the authorized signatory of WIP)

NON-DISCLOSURE AGREEMENT (NDA)

between

<Name of State/UT> Government & <Name of WIP>

THIS AGREEMENT is entered into on this ___Day of _<Month>, YYYY,

Between:

<Name of WIP> (Hereinafter referred to as Receiving Party") whose expression shall include its nominees, permitted assigns and legal representatives on the first part

AND

<Name of State/UT> Government (hereinafter referred to as "Disclosing Party"), which expression shall include its successors, permitted assigns and legal representatives on the second part

WHEREAS The <Name of WIP> has been awarded the work of implementation of WINDS framework as brought out by WINDS Manual 2023, in the <Name of the State/UT> by virtue of Agreement dated <DD/MM/YYYY>. (Hereinafter referred to as "the Work").

WHEREAS in connection with the Work, it may be necessary or desirable for Disclosing Party to disclose to Receiving Party confidential information relating to Work or the Disclosing Party has already disclosed such information as on the date of execution of this agreement as defined hereinafter ("the Confidential Information"). Now, it is desirable by the Disclosing Party that no use, disclosure or dissemination shall be made or has been made by the Receiving Party to any third party, of the Confidential Information other than in the circumstances specified and permitted hereinbelow by the Disclosing Party. Hence this agreement.

NOW THE AGREEMENT WITNESSETH AS FOLLOWS

Definition of Confidential Information

(a)   For purposes of this Agreement, "Confidential Information" refers to any data, document, information etc. of whatsoever nature, supplied by the Disclosing Party, whether proprietary or non-proprietary to the Disclosing Party and not generally known to the public, whether in tangible or intangible form, in whatever medium provided, whether unmodified or modified by Disclosing Party whenever and however disclosed, including, but not limited to: (i) any marketing strategies, plans, financial information, projections, operations, sales estimates, business plans and performance results relating to the past, present or future business activities of the Disclosing Party, its affiliates, subsidiaries and affiliated companies; (ii) plans for products or services, and customer or supplier lists; (iii) any scientific or technical information, invention, design, process, procedure, formula, improvement, technology or method; (iv) any concepts, reports, data, know-how, works-in-progress, designs, development tools, specifications, computer software, source code, object code, flow charts, databases, inventions, information and trade secrets; and (v) any information generated by the Receiving Party that contains, reflects, or is derived from any of the foregoing. Confidential Information need not be novel, unique, patentable, copyrightable or constitute a trade secret in order to be designated Confidential Information. The Receiving Party acknowledges that the Confidential Information may be proprietary or non-proprietary (including information submitted under any NDA with any other entity to whom such information is proprietary) to the Disclosing Party, has been developed and obtained through great efforts by the Disclosing Party and that Disclosing Party regards all of its Confidential Information as trade secrets.

(b)   Notwithstanding anything in the foregoing to the contrary, Confidential Information shall not include information which: i) was lawfully possessed except under any NDA, as evidenced by the Receiving Party's records, by the Receiving Party prior to receiving the Confidential Information from the Disclosing Party; (ii) becomes rightfully known by the Receiving Party from a third-party source not under an obligation to the Disclosing Party to maintain

confidentiality; (iii) is generally known by the public through no fault of or failure to act by the Receiving Party inconsistent with its obligations under this Agreement; (iv) is required to be disclosed in a judicial or administrative proceeding, or is otherwise requested or required to be disclosed by law or regulation; and (v) is or has been independently developed by the Receiving Party without violation of the terms of this Agreement, as evidenced by the Receiving Party's records, and without reference or access to any Confidential Information.

Disclosure of Confidential Information

From time to time, the Disclosing Party may disclose Confidential Information to the Receiving Party. The Receiving Party will: (a) keep all Confidential Information strictly confidential by using a reasonable degree of care, but not less than the degree of care used by it in safeguarding its own confidential information; and (b) not disclose any Confidential Information received by it to any third parties (except as otherwise provided for herein).

Use of Confidential Information

The Receiving Party agrees to use the Confidential Information solely and exclusively in connection with the scope of the Work and not for any purpose other than as authorized, with the prior written consent of an authorized representative of the Disclosing Party. No other right or license, whether expressed or implied, in the Confidential Information is granted to the Receiving Party hereunder. Title and all rights including Intellectual Property Rights to the Confidential Information shall be and vest solely in the Disclosing Party. The Confidential Information by the Receiving Party shall be solely used for the purpose of said Work and not for any other purposes whatsoever and any modifications and improvements thereof by the Receiving Party shall be the sole property of the Disclosing Party.

Compelled Disclosure of Confidential Information

Notwithstanding anything in the foregoing to the contrary, the Receiving Party may disclose Confidential Information pursuant to any governmental, judicial, or administrative order, subpoena, provided that the Receiving Party promptly notifies, to the extent practicable, the Disclosing Party in writing of such demand for disclosure so that the Disclosing Party, at its sole expense, may seek to make such disclosure subject to a protective order or other appropriate remedy to preserve the confidentiality of the Confidential Information; provided that the Receiving Party will disclose only that portion of the requested Confidential Information that, in the written opinion of its legal counsel, it is required to disclose under this Para. The Receiving Party agrees that it shall not oppose and shall cooperate with efforts by, to the extent practicable, the Disclosing Party with respect to any such request for a protective order or other relief. Notwithstanding the foregoing, if the Disclosing Party is unable to obtain or does not seek a protective order and the Receiving Party is legally requested or required to disclose such Confidential Information, disclosure of such Confidential Information may be made without liability.

Remedies

The Receiving Party acknowledges that the Confidential Information to be disclosed hereunder is of a unique, sensitive and valuable character and includes all trade secrets, and that the unauthorized dissemination of the Confidential Information would destroy or diminish the value of such information and also impact the business of the Disclosing Party. The damages to Disclosing Party that would result from the unauthorized dissemination of the Confidential Information would be impossible to calculate. Therefore, the Receiving Party hereby agrees that the Disclosing Party shall be entitled to injunctive relief preventing the dissemination of any Confidential Information in violation of the terms hereof. Such injunctive relief shall be in addition to any other remedies available hereunder, whether at law or in equity. The Disclosing Party shall be entitled to recover its costs and fees, including reasonable attorneys' fees, incurred in obtaining any such relief. Further, in the event of litigation relating to this Agreement, the Disclosing Party shall be entitled to recover its reasonable attorney's fees and expenses. As such, the Receiving Party hereby undertakes to indemnify and hold harmless the Disclosing Party from and against any loss or damage suffered, including all costs, expenses, attorney's fees, loss of income, incurred to the Disclosing Party due to breach or noncompliance of the terms and conditions of this agreement

Return of Confidential Information

The Receiving Party shall immediately return and redeliver at its own cost, to the Disclosing Party all tangible material embodying any Confidential Information provided hereunder and all notes, summaries, memoranda, drawings, manuals, records, excerpts or derivative information deriving therefrom, and all other documents or materials ("Notes") (and all copies of any of the foregoing, including "copies" that have been converted to computerized media in the form of image, data, word processing, or other types of files either manually or by image capture) based on or including any Confidential Information, in whatever form of storage or retrieval immediately but not later than 30 days, upon: (i) the completion or termination of the dealings between the parties contemplated hereunder; (ii) the termination of this Agreement; or (iii) at such time as the Disclosing Party may so request; provided however that the Receiving Party may retain such of its documents as is necessary to enable it to comply with its reasonable document retention policies. Alternatively, the Receiving Party, with the written consent of the Disclosing Party may (or in the case of Notes, at the Receiving Party's option) immediately destroy any of the foregoing embodying Confidential Information (or the reasonably nonrecoverable data erasure of computerized data) and, upon request, certify in writing such destruction by an authorized officer of the Receiving Party supervising the destruction).

Notice of Breach

The Receiving Party shall notify the Disclosing Party immediately upon discovery of, or suspicion of, (1) any unauthorized use or disclosure of Confidential Information by the Receiving Party; or (2) any actions by the Receiving Party inconsistent with their respective obligations under this Agreement, and the Receiving Party shall cooperate with any and all efforts of the Disclosing Party to help the Disclosing Party regain possession of Confidential Information and prevent its further unauthorized use, disclosure or dissemination.

Miscellaneous

This Agreement between parties supersedes any prior written or oral agreements relating hereto and can only be amended or modified by subsequent agreement in writing signed by both the Parties.

The construction and performance of this Agreement shall be governed by the laws of India. Both Parties accept the exclusive jurisdiction of the <State/UT Name> courts.

Notwithstanding anything contained herein or in any other agreement/document with respect to the said Work, the provisions of this Agreement shall survive and continue even after the termination or early termination of Agreement.

IN WITNESS HEREOF, this Agreement has been executed by the Parties hereto, as of the date first hereinabove stated

For and on behalf of <Name of the Department>, Government of <Name of State/UT>	**For and on behalf of <Name of WIP>**
Name: _____	Name: _____
Title: _____	Title: _____
Date: <DD/MM/YYYY>	Date: <DD/MM/YYYY>

Declaration of Acceptance of Tender Terms & Conditions

(On the letter head of the WIP)

To,   Date: <DD/MM/YYYY>

_____,

Department of Agriculture,

Government of <name of State/UT>

_____,

_____.

Dear Sir,

I/We, the undersigned have examined the above-mentioned tender document, (including amendment /corrigendum (if any)), the receipt of which is hereby confirmed. We now offer to supply and deliver the goods and services in conformity with terms & conditions mentioned in your above referred document.

If our tender is accepted, we undertake to supply the goods and perform the services (Installation & commissioning etc.) as mentioned in tender document with the delivery schedule specified in the "Tender Document- List of requirements/ technical specifications".

I/We further confirm that, if supply/purchase order is placed to firm, we shall provide performance security of required amount in an acceptable form for due performance of the contract.

I/We agree to keep our tender valid for acceptance as required in tender document or for subsequently extended period, if any, agreed to by us. I/We also accordingly confirm to abide by this tender up to the aforesaid period and this tender may be accepted any time before the expiry of the aforesaid period. I/We further confirm that, until a formal contract is executed, this tender read with your written acceptance thereof within the aforesaid period shall constitute a binding contract between us.

I/We further understand that you are not bound to accept the lowest or any tender you may receive against your above-referred tender enquiry.

We confirm that we do not stand deregistered/banned/blacklisted by any   Central/State Govt or any entity controlled by it from participating in any project authorities.

 I/We confirm that we fully accept and agree to all the terms and conditions specified in above mentioned Tender document, including amendment/ corrigendum etc. if any.

Place:

Date: <DD/MM/YYYY>   (Seal & signature of the authorized signatory of WIP)

Pre-Bid Queries Format

Pre-Bid Queries Format:
Name of the Supplier:
Department Name:
Tender Ref. No.:
Tender Name:
Due date:

SI No	Tender Document Page No.	Tender Document Clause No.	Clause Title	Queries/Clarification	Justification by Bidder

Abbreviations (To be Expanded)

ARG	:	Automatic Rain Gauge
AWS	:	Automatic Weather Station
BWS	:	Back-up Weather Stations
CCE	:	Crop Cutting Experiment
CRIDA	:	Central Research Institute for Dryland Agriculture
CROPIC	:	Collection of Real-time Observations and Photographs of Crops
DA&FW		Department of Agriculture and Farmers Welfare
DL	:	Data Logger
GoI		Government of India
GP		Gram Panchayat
ICAR	:	Indian Council of Agriculture Research
IMD	:	India meteorological Department
KSNDMC	:	Karnataka State Natural Disaster Monitoring Centre
MNCFC	:	Mahalanobis National Crop Forecast Centre
NABL	:	National Accreditation Board for Testing and Calibration of Laboratories
MOSDAC	:	Meteorological and Oceanographic Satellite Data Archival Centre
MoA&FW		Ministry of Agriculture and Farmers Welfare
NHM	:	National Horticulture Mission
NRSC	:	National Remote Sensing Centre
PMFBY		Pradhan Mantri Fasal Bima Yojana
QCI	:	Quality Council of India
RH	:	Relative Humidity
RUA's	:	Reference Unit Area's
RWBCIS		Restructured Weather Based Crop Insurance Scheme
RWS	:	Reference Weather Stations
SAC	:	Space Application Centre
SOP	:	Standard Operating Procedure
TBRG	:	Tipping Bucket Rain Gauge
VEDAS	:	Visualization of Earth Observation Data and Archival System
WMO	:	World Meteorological Organization
WINDS	:	Weather Information Network Data System
WIP	:	WINDS Implementation Partners

SECTION 3

Agreement

Implementation of WINDS

Agreement

between

**Department of <Name of Department> of Government
of <Name of State/UT>,**

and

< Name of WINDS Implementation Partner (WIP)>,

AG Period: _____

Agreement (AG)

This Agreement (hereinafter called the "Agreement/AG") is Made on the _____ day of _____ 2023, between the <Name of the Department>, Government of <Name of State/UT>, <Department Address> (hereinafter referred to as "Department" which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and permitted assigns), as the First Party

And

(Name of WIP), having its Head Office at <address of office>, (hereinafter referred to as "WIP" which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and assigns) as the Third Party.

(The Department, WIP shall be collectively referred to as "Parties" and individually as a "Party".)

Whereas

1. Government of (Name of State/UT) AND Government of India (GoI) have decided to execute WINDS project across the State/UT of <Name of State/UT>, for setting up of Automatic Weather Station (AWS) at Block/Tehsil/Taluk level and Automatic Rain Gauge (ARG) at Gram Panchayat (GP)

2. Government of (Name of State/UT) floated the Tender Document for selection of the WIP for implementing WINDS in the State/UT on <DD/MM/YYYY> and <Name of the WIP> has been selected as L1 bidder.

<div align="center">'Or'</div>

   The Government of (name of State/UT) has nominated <Name of the WIP> from the WIPs empanelled by the WINDS Committee, for implementation of WINDS.

3. The WIP is in the business of setting up of Automatic Weather Station (AWS) and Automatic Rain Gauge (ARG) for providing weather data related services.

4. Mahalanobis National Crop Forecast Centre (MNCFC), Department of Agriculture and Farmers Welfare (DA&FW), Ministry of Agriculture and Farmers Welfare (MoA&FW), GoI, is the nodal agency and will serve as the secretariat of the WINDS Committee, managing day-to-day matters and acting as the Single point of Contact (SPOC) with the GoI for all WINDS related activities and implementation of the said project and programme.

5. Execution of WINDS shall be done as per the WINDS Manual 2023 notified by DA&FW, MoA&FW, GoI and the terms and conditions of the WINDS manual as notified by DA&FW, MoA&FW, GoI, including any subsequent amendments thereof, shall also form part and parcel of the present agreement.

6. The Parties shall carry out all the activities, duties and responsibilities) as outlined in the WINDS Manual 2023 published and circulated amongst all stakeholders under PMFBY, vide letter <insert letter number and date> and as per the terms of tender floated by the Government of <name of the State/UT>.

7. The Parties shall execute the work under this Agreement (AG) in compliance of all prevailing and applicable Laws/Rules/Regulations/Guidelines as amended from time to time

8. The Department shall be the custodian of all the information/datasets created on implementation of the individual project(s), as posed by and sanctioned by DA&FW, MoA&FW, GoI.

9. The WIP shall operate and maintain these information/datasets for WINDS implementation in the project areas and the same shall be governed by data and information sharing policy of the WINDS Manual 2023, as amended from time to time.

10. The "Parties" agree to implement WINDS as above and conforming with the WINDS Manual 2023, as amended from time to time.

11. Any provision not specifically provided under this Agreement shall be governed by the WINDS Manual 2023, as amended from time to time.

NOW, therefore, in consideration of the premises and mutual, covenants and conditions set-forth herein (which shall form an integral part of this Agreement), it is hereby agreed by and amongst the "PARTIES" as follows:

1. **Preamble**

1.1. **<Brief description of the Project>**

1.2. **Brief Description of the Department, Government of <Name of State/UT>**

1.3. **Brief Description of the WIP < Name of the Organization>**

1.4. **Roles and Responsibilities of the Parties**

The Parties shall be bound by the roles and responsibilities as provided in the WINDS Manual 2023, as amended from time to time.

2. **Authorized Signatories**

Party	Authorized Signatory

2.1. **Functionaries and Contact Addresses**

The addresses and contact details of functionaries who will serve as nodal officers for carrying out WINDS execution, coordination and monitoring

<Name of State/UT Department>, Government of < Name of State/UT>

S. No.	Name	Contact Address	Telephone/ Fax	e-mail
1				
2				
3				

<Name of WIP>

S. No.	Name	Contact Address	Telephone/ Fax	e-mail
1				
2				
3				

3. **Date of Signing, Effective Date and Duration of Agreement**

The term of this Agreement (AG) shall be for a period of _____ years/months and shall be effective from <DD/MM/YYYY>.

4.   Payment Terms

The Department will release funds for implementing WINDS to WIP as per the Payment Terms mentioned in the WINDS Manual 2023, to meet the expenditure incurred upon for carrying out the services described in the WINDS Manual 2023, as amended from time to time.

5.   Project Management (Scope of Activities)

5.1.   The WIP shall carry out all the activities as outlined WINDS Manual 2023, as amended from time to time, in conjunction with the terms and conditions of Tender Document floated by Government of (name of State/UT).

6.   Deliverables (Reports)

6.1.   The WIPs will submit periodic reports as per the WINDS Manual 2023, as amended from time to time.

6.2.   WIP shall take all necessary steps to complete the project within the approved time frame starting from the date of award of project.

6.3.   The performance evaluation of the WIP shall be done as per the Monitoring and Evaluation (M&E) framework, as described in the WINDS Manual 2023, as amended from time to time.

7.   Warranties

The WIP undertakes and confirms that the data, information and/or reports delivered, created, generated (through AWG/ARGs) under this Agreement is accurate and correct and the WIP shall indemnify the Department for any loss, damage, injury caused due to the inaccuracy and/or incorrectness of the data, information and/or reports delivered under this Agreement.

8.   Dispute Resolution

All disputes between the Parties, arising out of or in connection to this Agreement shall be governed by the dispute resolution mechanism as mentioned in the WINDS Manual 2023, as amended from time to time.

9.   Implementation of the Agreement

All discretions to be exercised and directions, approvals, consents and notices to be given and actions to be taken under these presents, unless otherwise expressly provided herein, shall be exercised and given by the signatories to this Agreement or by the Authorized representative(s) that each party may nominate in this behalf and notify in writing to the other party by Registered Post. Any other nomination of Authorized representative(s) and/or changes in designation shall be informed likewise in writing to/ the Department within one month of signing of the Agreement. Any changes in designations/ registered office address shall be intimated in writing to all concerned parties.

10.   Penalty & Damages

The Department reserves the right to impose penalties and recover damages from the WIP per the WINDS Manual 2023, as amended from time to time, in case of non-performance of the Agreement by the WIP, breach of the terms of this Agreement/tender document/WINDS Manual, delay in performance of work or any other non-compliance as contained in the WINDS Manual 2023, as amended from time to time.

11.   Intellectual Property Rights

GoI shall facilitate the operationalization of AWS/ARG network under WINDS with private player participation on the basis of 'renting of data' i.e., final payment shall be linked to the data received at the WINDS portal, maintained by DA&FW. Data generated from AWS/ARGs under WINDS shall be directly sent to the WINDS Portal as per the data and information sharing policy of WINDS.

The WIPs can explore the commercial potential of the weather data generated through AWS/ARG network installed and maintained by them under WINDS.

However, WIPs shall not provide any data to any entity specifically restrained by the GoI. Further, data of stations/area notified by IMD or any other Government body as classified, shall also not be shared by the WIPs. The same shall be described in the data and information sharing policy of WINDS, to be notified separately by the WINDS Committee.

The GoI and the State/UT Governments shall have the liberty to use the data generated under WINDS for public purposes, including but not limited to, implementation of welfare and development schemes, research and development works, developing weather advisory/agro-meteorological advisory, disaster management or for any other purpose involving larger public interest through Central/State/UT Government bodies or any other public institution including IMD, etc.

The WINDS data shared by GoI with any entity shall not be used for any other purpose or shared with any third party or monetized by such entities.

Each Party shall own and retain all rights in its own IP including trademarks, logos and other brand elements. To the extent any party grants any rights or licenses of its IP to the other party in connection with this Agreement, the other party's use of such IP shall be for the purpose as agreed by Parties in writing. Each Party will ensure appropriate protection of their respective intellectual property rights. The original information, the methodology adopted, original data, derived data, the originals of any reports and documents or materials prepared, or inventions or information produced as a result of the services and all intellectual property rights therein, unless otherwise specifically stated in the WINDS Manual 2023, as amended from time to time, and this agreement, shall be and shall remain exclusive property of the <Name of the State/UT> Government and the GOI, jointly and severally, as per the Data Sharing Protocols of the WINDS Manual 2023, as amended from time to time. Each Party will ensure appropriate protection of intellectual property rights generated from cooperation pursuant to this Agreement, consistent with laws, rules, and regulations of India.

12. Confidentiality

Except with the prior written consent of the GoI and <Name of the State/UT> Government, the WIP shall not at any time communicate to any person or entity any confidential information acquired in the course of implementation of WINDS Manual, nor shall the WIP and its Personnel make public the recommendations formulated in the course of, or as a result of, the execution of this Agreement. For this purpose, the Parties shall execute a Non-disclosure Agreement (NDA) in the prescribed format.

13. Notice(s)

All notices required or referred to under this Agreement, shall be in writing and signed by the respective authorized signatories of the parties mentioned herein above, unless otherwise notified. Each such notice shall be deemed to have been duly given if delivered or served by email, registered/speed post of Department of Posts to the respective heads on the addresses mentioned in the recital.

14. Termination

14.1. Either party shall be entitled to terminate the Agreement under specific situations and conditions as mentioned below, with an advance notice of ninety (90) days. The special conditions that invite termination of Agreement are as follows:

a)   In case, the WIP is debarred/black-listed/de-empanelled by the WINDS committee.

b)   Failure of the State/UT and/or the WIP in performing their core responsibilities as prescribed in this manual.

c)   Any material changes in the WINDS parameters as listed in the empanelment criteria of WIPs and their roles and responsibilities, by the Centre/State/UT.

d)   In case liquidated damages imposed on the WIPS exceed the limit of 10% of the procurement cost of weather data for the agreement period, as mentioned in the WINDS Manual 2023.

e)   If it is found that more than 10% of the AWS/ARGs in the network, installed and maintained by the WIPs, are not functioning properly or are not providing quality data as per the norms, for more than One Month, the State/UT Government may de-notify the AWS/ARG network of part thereof.

f)   Termination proceedings shall be initiated if the malfunctioning AWS/ARG network or part thereof as de-notified by the State/UT are not installed within 15 days of such notification.

g)   Upon termination of Agreement, the WIP shall hand over peaceful possession of the premises / site to the State/UT Government except the AWS/ARG's machinery with all related accessories. However, fencing, foundation / brick masonry works, sign boards, tower for mounting instruments, lightening arrestor and miscellaneous accessories / assets etc. shall remain at site.

14.2. Termination of Agreement by either party due to any reason not listed above shall be taken up by the concerned State/UT govt. with the approval of competent authority, as per their respective financial rules.

15.   Indemnification

15.1. Each party agrees to indemnify and keep indemnified the other party from and against all claims, losses, injuries, liabilities, reasonable costs and expenses, damages, actions or proceedings which may be made or taken against such indemnified party by any third party arising out of the breach of this Agreement, non-performance of the Agreement or non-compliance of any statutory compliances by the indemnifying party.

15.2. The WIP shall, at its own cost and expenses, defend and indemnify the <Name of the State/UT Department>, Government of <Name of State/UT> against all third-party claims including those of the infringement of intellectual property rights, including patent, trademark, copyright, trade secret or industrial design rights, breach of confidentiality, arising from the performance of the Agreement.

16.   Relationship between the Parties

16.1. Parties to this Agreement are independent Parties and nothing in this Agreement shall make them Parties to a joint venture, partners, employee, agents, or representatives of the other Party hereto, none of the Parties shall make any representation that implies otherwise.

16.2. Each Party assures, agrees, confirms, and undertakes that during the term of this Agreement and after the termination or expiration of this Agreement, it shall not make any statement verbally or in writing or in any other form or manner which may in any manner whatsoever contrary to factual detail, which could cause harm, damage or be detrimental to the reputation or goodwill or brand value or business or clients of such other Party.

17.   Jurisdiction & Governing Law

The competent Courts of <Name of City/State> shall have exclusive jurisdiction in all matters relating to or arising out under these presents and the Parties shall be governed by the laws prevailing in India.

18.   Force Majeure

Neither Party shall be liable for any delay or failure to perform any duty or obligation it may have pursuant to this Agreement, if such delay or non-performance is attributable to a an event which is beyond the reasonable control of a Party, is not foreseeable, is unavoidable and not brought about by or at the instance of the Party claiming to be affected by such events including, but not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other extreme adverse weather conditions, strikes, lockouts or other industrial action (except where such strikes, lockouts or other industrial action are within the power of the Party invoking Force Majeure). In case of a Force Majeure event the Party affected by the Force

Majeure shall notify the other Party thereof without undue delay. Performance deadlines under this Agreement shall be extended for a period of time equivalent to the duration of the Force Majeure event; provided, however, that if the Force Majeure event, in the aggregate, lasts for a period of more than 30 days, the other Party, at its option, may terminate this Agreement upon written notice to the affected Party.

19. **Amendments**

This Agreement hereto read with the WINDS Manual 2023 and the Tender Document, constitute the sole record of the agreement between the Parties in relation to the subject matter hereof. Neither Party shall be bound by any express, tacit, or implied term, representation, warranty, promise or the like not recorded herein or in the WINDS Manual 2023, as amended from time to time. This Agreement supersedes and replaces all prior commitments, undertakings, or representations, whether oral or written, between the Parties in respect of the subject matter hereof. No addition to, variation, novation or agreed cancellation of any provision of this Agreement shall be binding upon the Parties unless reduced to writing and signed by or on behalf of the Parties.

IN WITNESS WHEREOF the parties have executed these presents through their authorized Representative at _____.

Signatures		
Name of the Authorized Signatory		
Party	For and on behalf of <Name of the Department>, Government of <Name of State/UT>	For and on behalf of <Name of WIP>
Date		

Witness 1.

Witness 2.

Pradhan Mantri
Fasal Bima Yojana

DEPARTMENT OF AGRICULTURE & FARMERS WELFARE
MINISTRY OF AGRICULTURE & FARMERS WELFARE
GOVERNMENT OF INDIA