Annexure – 45

(15.4)

(Weather forecast station in collaboration with IMD)

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SHIVPURI (M.P.)

University Established Under section 2(F) of UGC ACT 1956 Vide MP Government Act No 17 of 2015

Ref. No. **Date.....**

The Required information in ***Proforma for submission of information by State Private Universities*** which is asked under **15. Accreditation 15.4 any other information likes special achievements by the University which may be relevant for the University.**

Weather forecast station with collaboration of IMD is attached.

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P. K. University
Shivpuri (M. P.)

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P.K. UNIVERSITY
SHIVPURI (M.P.)

Registrar
P. K. University
Shivpuri (M. P.)

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SHIVPURI (M.P.)

CAMPUS : VILLAGE - THANRA, TEHSIL - KARERA, NH-27, DIST. - SHIVPURI (M.P.) -473665
Mob.: 7241115088, Email: registrar.pkuniversity@gmail.com

ग्रामीण कृषि मौसम सेवा

पी.के.विश्वविद्यालय (P.K. University)

ब्लॉक (Block) : करैरा (Karera)

जिला (District): शिवपुरी (मध्यप्रदेश) (Shivpuri, M.P.)

[दिनांक(Date): 03 Feb – 07 Feb 2024]

(पी.के विश्वविद्यालय ,शिवपुरी (म.प्र) तथा भारत मौसम विभाग से संयुक्त रूप से जारी।) आगामी पांच दिन का मौसम पूर्वानुमान:

आंचलिक कृषि अनुसन्धान केंद्र ब्लॉक: करैरा , जिला: शिवपुरी को माध्यम कालिन मौसम पूर्वानुमान केअनुसार करेरा विकासखंड में आगामी पांच दिनों में आसमान साफ से छुटपुट बादल रहने व बूंदा – बांदी होने का अनुमान है। अधिकतम तापमान 22.9 से 25.9 डिग्री सेंटी ग्रेट व न्यूनतम तापमान 9.4 से 12.3 रहने का अनुमान है। हवाओं की दिशा उत्तर – पूर्व चलने की सम्भावना हैं हवा 6 से 13 किमी/ घंटा चलने का अनुमान है।

दिनांक (Date)	वर्षा (मिम) [Rainfall (mm)]	अधिकतम तापमान (डिसें) [Temp Max (°C)]	न्यूनतम तापमान (डिसें) [Temp Min(°C)]	बादलों की स्थित (Cloud Cover) (Octa)	अधिकतम आद्रता (%) (Humidity Max) (%)	न्यनतम आद्रता (%) (Humidity Min) (%)	हवा की गति (किमी/घंटा) [(Wind speed (kmph)]	हवा की दिशा [Wind direction (deg)]
2024-02-03	0.0	23.1	9.4	0	57	34	8	18
2024-02-04	0.0	23.7	11.2	2	50	18	6	65
2024-02-05	0.3	25.9	11.5	3	95	34	13	113
2024-02-06	3.7	23.5	12.3	4	98	39	11	73
2024-02-07	0.0	22.9	11.0	1	86	45	7	20

कृषको को सलाह –संभावित मौसम में निम्न लिखित कृषि कार्य करने की सलाह दी जाती है।

सामान्य सलाहक:

कृषि मौसम ईकाई केअनुसार आगामी पांच दिनों में छुटपुट से मध्यम बादल रहने एवं बारिश होने काअनुमान है। किसानो को सलाह दी जाती है कि फसलों में आवश्यक कृषि कार्य मौसम पूर्वानुमान को देखते हुए करें।

लघु संदेश सलाहकार:

मौसम पूर्वानुमान केअनुसार पक्कर तैयार फसल कीकटाई न करेंव कटीहुई फसल कोवर्षासेबचानेकेलिएसुरक्षित स्थान पर रखे।

बागवानी विशिष्ट सलाह:

बागवानी	बागवानी विशिष्ट सलाह

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प्याज	फफूंद जनित बीमारियों एवं गलन के लक्षण दिखाई देते ही कॉपर ऑक्सीक्लोराइड 2.5 ग्राम/लीटर + स्ट्रेप्टोसायक्लिन सल्फेट 0.2 ग्राम/लीटर या मेटालेक्जिल + मेंकोजेब 2.5 ग्राम/लीटर की दर से छिड़काव करें।

फ़सल विशिष्ट सलाह:

फ़सल	फ़सल विशिष्ट सलाह
गेंहू	मौसम पूर्वानुमान को देखते हुये आगामी 1-2 दिंनो तक बूंदा-बादी तथा बारिश होने का अनुमान है गैंहू की फसल में सिंचाई व उर्वरकों का प्रयोग न करें।
सरसों	मौसम पूर्वानुमान को देखते हुये आगामी 2-3 दिंनो तक बूंदा –बादी तथा बारिश होने का अनुमान है सरसों की कटाई का कार्य रोक दिया जाए तथा कटी हुई फसल को सुरक्षित स्थान पर रखें।
चना	मौसम पूर्वानुमान को देखते हुये आगामी 2-3 दिंनो तक बूंदा-बादी तथा बारिश होने काअनुमान है चना की फसल मेआवश्यक अंतर्वर्ती कृषि कार्य मौसम को देखते हुये करें।

पशुपालन विशिष्ट सलाह:

पशुपालन	पशुपालन विशिष्ट सलाह
भेंस	पशुओं को सर्दी से बचाने हेतु सूखी घास की बिछावन फर्श पर बिछाए, शरीर पर टाट या बोरी लपेटे, खिड़की या जालियों में रात्रि के समय पर्दे डालें, दिन केसमय पशुओं को धूप में बांधे एवं ताजा व स्वच्छ पानी पिलाएँ।
बकरा	बकरियों को ठंड से बचाव केलिए पशुशाला को चारों तरफ से बंद करके रखें तथा पेट के कीड़ों की दवा पिलाए एवं पी पी आर का टीका करण अवश्य करा लें।

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General Advisory:

According to the District Agricultural Meteorological Unit, there is a forecast of scattered to moderateclouds and rain in the next five days. Farmers are advised to do necessary agricultural work keeping inview the weather forecast.

Crop Specific Advisory:

Crop(Varieties)	Crop Specific Advisory
WHEAT	Looking at the weather forecast, drizzle and rain are expected for the next 2-4 days. Necessary agricultural work in the wheat crop should be done keeping the weather in mind.
MUSTARD	Considering the weather forecast, drizzling and rain is expected for the next 2-3 days, the harvesting of Mustard should be stopped and the harvested crop should be kept in a safe place.
CHICK PEA	Looking at the weather forecast, drizzle and rain are expected for the next 2-3 days. Do the necessary intervening agricultural work in the gram crop keeping the weather in mind

Horticulture Specific Advisory:

Horticulture(Varieties)	Horticulture Specific Advisory
ONION	As soon as symptoms of fungal diseases and rot appear, spray copperoxy chloride at the rate of 2.5 grams/liter + streptomycin sulphate 0.2 grams/liter or Metalaxyl + mancozeb 2.5 grams/liter.

Live Stock Specific Advisory:

Live Stock(Varieties)	Live Stock Specific Advisory
BUFFALO	To protect the animals from the cold; lay the dry grass laying on the floor, wrap tots or sacks on the body, put curtains in the window or net at night, tie the animals in the sunlight during the day and drink fresh and clean water.
GOAT	To protect the goats from cold, keep the cattle shelter closed from all sides and give medicine for stomach worms and get PPR vaccination done.

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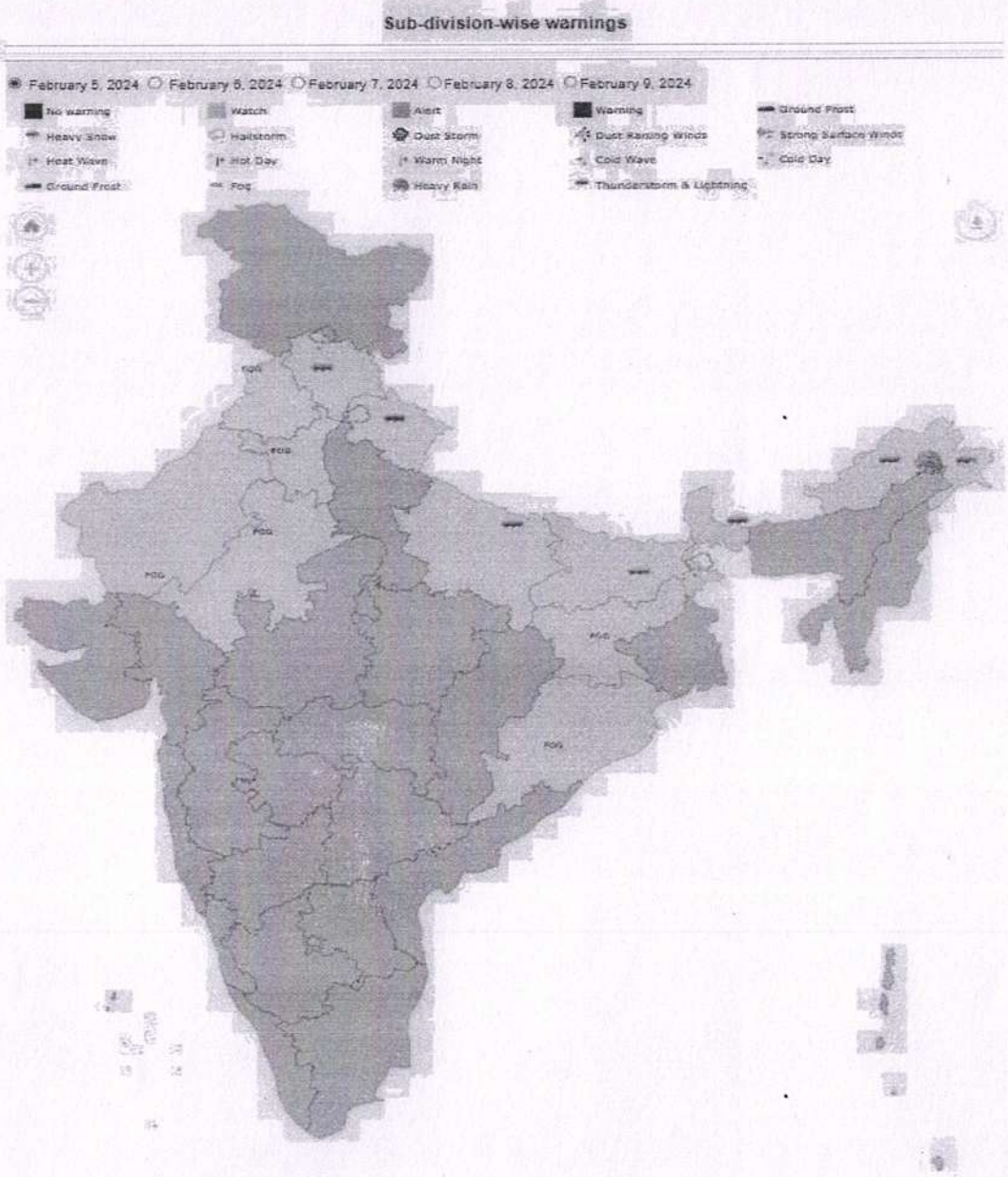
District-Wise-Warning-Shivpuri

03-02-2024 – No Warning, 04-02-2024 – No Warning, 05-02-2024 – No Warning,
06-02-2024 – No Warning, 07-02-2024 – No Warning



(डॉ. दीपेश नामदेव)
नोडल ऑफिसर

नोट : अधिक जानकारी के लिए फ़ोन नंबर : 7241115090 पे संपर्क करें।

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Established Under UGC Act 2F, 1956

Ref. No. PKU/2020/03/14/VC-IMP/002-273 Date. 14.03.2020

To,
The Director General
Indian Meteorological Department
New Delhi

Sub: Request to grant Automatic Weather Station (AWS) for Karera Block, Shivpuri- Reg.

Respected Sir,

We are submitting proposal with the request to grant/install **Automatic Weather Station** (AWS) at Karera block of Dist. Madhya Pradesh. Precise Agromet information system will be very useful in the development of the remote areas and interacting with farming community for enhancing crop production. Saharia tribes will be also benefited by the accurate forecasting of the weather parameters, judicial for agriculture development.

The installation of **Automatic Weather Station** (AWS) proposals are submitted for your kind consideration please.

Thanking You

With Regards

Dr Y.M.Kool
Vice Chancellor
P.K.University
Shivpuri MP- 473665

Enclosures:
- Automatic Weather Station (AWS) installation at Karera Block proposals
- Certificate

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ADDRESS : NH-25, Dinara, Shivpuri (M.P.) • Mob. 7241115081

PROJECT

Automatic Weather Station (AWS)
Block: Karera
Distt: Shivpuri
Madhya Pradesh

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PROFORMA FOR SUBMISSION OF PROJECT TO IMD

1. Title of Project: Establishment of Automatic Weather Station for Rural Experimental Advisory Centre Karera Block, Distt: Shivpuri (M.P)
2. Name of Station/Place: P.K University , Village Thanara, Tehsil: Karera, Distt: Shivpuri
3. Location: 25.4568° N, 78.1279° E
4. Elevation / Altitude: 264 meters. Above Seal level
5. Name of Principal Investigator: Shri J. Mishra (Nodal Officer)
6. About Location –

Locality Name :Karera (करेरा)

Tehsil Name :Karera

District :Shivpuri

State : Madhya Pradesh

Division : Gwalior

Language : Hindi

Time zone: IST (UTC+5:30)

Elevation / Altitude: 264 meters. Above Seal level

Telephone Code / Std Code: 07493

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Geography

Karera is the second-largest city in the Shivpuri district after Shivpuri itself. Karera is located at 25.47°N 78.15°E.[1] It has an average elevation of 305 meters (1000 feet) and covers approximately 41.8 km.

Demographics

According to the 2011 India census,[2] Karera has a population of over 28,000. Males constitute 55% of the population, while females constitute 45%. Sixteen percent of the population is under 6 years of age. Karera has an average literacy rate of 78%, higher than the national average of 59.5%. Male literacy is 83% and female literacy is 64%.

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Tourist attractions

There are six Jain Temples

Karera Fort

FootaTaal

River

MP's longest river bridge Amola approximately 2 km

Samoha Dam

Siddhan

"Nursery" Filter Road

Machhawali

Karera Wildlife Sanctuary

The Karera Wildlife Sanctuary was established in 1981, and spans an area of 202 km2. The sanctuary is managed by the field director of Madhav National Park in Shivpuri district.

Communication services

Karera is covered by an extensive fiber optic network. The Karera fixed telephone line operator in the city is BSNL. There are eight mobile phone companies in Karera, which include BSNL, Vodafone 4G, Idea 4G, Airtel 4G, Jio 4G, Tata DoCoMo 3G, CDMA services are offered by BSNL 3G. Internet broadband and IPTV services are provided by BSNL. The city is also connected to Digital TV.

Transport

Roads

Karera is connected with neighboring cities and other major cities of India by road (NH-25) Shivpuri, (NH-27) Jhansi, Sagar, Datia, Dabra, Lucknow, Indore, Bhopal, Guna, Gwalior, Kota, Orai, Kanpur, Allahabad, Ajmer, Jaipur, Udaipur, Ahmedabad.

Daily buses services operate within the city, with inter-city services also available daily to many cities in Madhya Pradesh, Uttar Pradesh and Rajasthan.

Railway

Karera is not directly accessible by rail, with the nearest railway stations located in Jhansi 45 km to the east and Shivpuri 55 km west of the city.

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Airways

The nearest major airport is located at Gwalior which operates flights to Delhi, Bhopal, Indore, Mumbai, Pune, Ahmedabad, Jabalpur, Jaipur, and most large cities in India.

Physical Sciences, Engineering Sciences, Medical Sciences and Pharmacy, Bio-Sciences, Agriculture and Veterinary Sciences, Social Sciences

Need for establishing Automatic Weather Station (AWS)

The manual rain gauge, dry and wet bulb thermometer, wind vane and soil temperature measuring thermometers are available at P K University weather station. Surface weather observations are widely expanding for multiple reasons: availability of new technologies, enhanced data transmission features, transition from manual to automatic equipment, early warning for critical climate risks. One of the main objective is to rehabilitate/increase the density of existing network, by providing data from new sites and from sites that are difficult to access and inhospitable. Despite the increasing number of AWS's deployed, many remote sites are still not covered by surface observations. To achieve the goal to improve AWS network planning, proposal are submitted to establish AWS at Kerara block, district shivapuri almost 65 km away from district HQ. The efficacy of the results mainly depends on the accurate choice of the sites of installation (network plan), on the correct selection and description of instrumentation type to prepared the proposal is submitted to IMD.

Introduction

An automatic weather station (AWS) is defined as a "meteorological station at which observations are made and transmitted automatically" (WMO 1992a). Despite the increasing number of AWS's deployed, many remote areas are not covered yet by surface observations. The P.K.University will provde trained personnel to manage the instrumentation, together with the risks associated with the safety of the equipment will be ensured. We request to establish AWS under the secured environment of PKuniversity. In this regard all the guidelines of IMD will be followed by us. We further request to grant two posts 1. Subject matter specialist (SMS) and 2. Observer, the details are enclosed subsequently.

Transition from Manual to AWS

The WMO ET-AWS-5 Geneva 2008 (WMO report 2008), agreed that human observers were able to integrate and classify a wide range of information needed for full description of weather events. With the advent of AWS, particular areas such as visual observations, cloud classification

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and weather type identification are handled poorly or not at all, by an AWS unattended by observer. On the other hand, AWS provide benefits in frequent, regular, objective and consistent measurements and can be located in any environment, including extremely remote and harsh conditions.

The transition to AWS is often instigated by a perception that these systems are cheaper to operate and easier to manage than human observers. This was not the experience of a number of member countries. Therefore, it identified a number of responsibilities and costs that may not be immediately apparent to those that adopt automatic systems. (Shanko 2015).

The change for automation is a reality in all networks (India, Nepal, Lebanon, Niger, Ethiopia, etc.) and the careful management of the transition process is needed to protect data user needs. Canada created a Change Management Board (CMB), to provide a forum for network planners, operational managers and data stakeholders to discuss strategic issues regarding the transition process. Before embarking on automation of their network, Members and/or local organizations should consider (i) the resource requirements, (ii) potential gains and losses, (iii) how to manage this transition, (iv) Training/professional improvement, (v) homogenization of different datasets.

M.J. Molineaux (Molineaux 2010) suggested a preliminary list of guidelines which would assist in the process of converting to automatic systems:

Management of network change

Defining and assigning responsibilities

System costing

Parallel testing (Traditional vs. automatic)

Metadata

Data quality and reliability

User requirements

Access to data and metadata

Theory and strategies:

Many AWS manufacturers have improved their products, allowing researchers, field assistants and operators to set up unattended data collection with several options depending on the field of application. Despite the availability of relatively cost-effective automatic stations, traditional

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instruments can still play an important role, as an alternative or back-up for the automatic network, especially in areas where a lack of personnel trained in electronic equipment is a limiting factor (Table 2.1).

Table 2.1

Comparison between traditional and automatic system

Type	Advantages	Disadvantages
Manual recording (Direct reading)	Simple use Rapid installation Immediate utilisation Reliability No power required	It needs an operator for data observations Slow data transfer from paper reports. Errors due to incorrect transcription. Low number of readings available
Mechanical (Chart recording)	Simple use Simple maintenance Reliability Rapid installation No power required	It needs an operator for chart replacement Errors during chart replacement and transcription Slow data transcription from strip diagrams High sensitivity to mechanical vibration
Automatic recording	Fast data acquisition Data real time visualization and/or transmission Large amounts of observations Data pre-processing Control output (alarms, water supply systems, etc.) In some cases low cost systems	Power supply required High professional maintenance Expensive sensor management Specialised laboratories for sensor calibration Electromagnetic interference on electronics

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Type	Advantages	Disadvantages
	can be exploited	

The WMO ET-AWS 6—2010 included the following considerations in the Final report. The meeting considered the report prepared by the CCl ET on Climate Database Management Systems (ET-CDBMS), in particular the observing requirements and standards for climate. The importance of retaining some manual stations for optimizing the complementary aspects of AWS and manual stations was emphasized. For a GIZ consultancies in Nepal I suggested to install RAWS together with a new set of manual sensors in order to facilitate the transfer process from traditional observing procedures to new technologies (Figs. 2.1 and 2.2). The observer should be kept in charge until the met service is not ready to rely on automatic equipment and to build up a dataset from manual and automatic stations in order to evaluate how this process may affects the observations.

RAWS Configuration and Requirements (Technical Specifications)

The Manual on the Global Observing System (WMO 2013), states the General requirements of a meteorological station as follows: "All stations shall be equipped with properly calibrated instruments and adequate observational and measuring techniques, so that the measurements and observations of the various meteorological elements, are accurate enough to meet the needs of synoptic meteorology, aeronautical meteorology, climatology and of other meteorological disciplines."

The requirements for AWS instruments have to take into consideration all aspects related to the ability to provide relevant and representative measurements over their entire life cycle.

The requirements for sensors installed at AWS can be ranked into three basic categories, all contributing to the long term sustainability of AWS data:

Requirements related to the measuring performance of instruments: the ability of an instrument to provide measurements with a stated uncertainty over the specified operating range and condition;

Requirements related to maintaining the traceability of measurements over the operational cycle; and

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Requirements related to the operational reliability of AWS sensors, which include features that enable their operation for extended periods, within the expected measuring performance, with minimum human intervention over their entire operating range. (WMO ET-AWS-5 2008)

These requirements and standards for AWSs operating in remote regions fall under several different broad aspects.

Telecommunications. GSM/GPRS is cheaper than Satellite communication. These networks are now available almost everywhere in many emerging countries. GPRS hardware is much cheaper as compared to satellite systems. GPRS networks may be used wherever they are available whereas satellite communications (such as IRIDIUM or ORBCOMM) have been used where GSM/GPRS networks are unavailable.

Power. Solar panels with backup batteries are a useful power source for AWS at remote areas. Solar panels and batteries are easily available and affordable in many regions. Sometime the use of wind turbines has been investigated at some sites, to integrate solar power (i.e. in CMA, China network). For specific sites, especially during wintertime, with low solar intensity and low temperatures, solar solutions alone do not supply reliable off-grid power, especially in critical weather and the dark seasons, so the use of fuel cell deserve mention. (i.e. New-Zealand remote snowfall stations)

Sensors. Robust and high quality sensors are suggested for remote areas. Sensors and the platform employed should be suitable for remote diagnostics and troubleshooting in order to avoid frequent inspection visits..

AWS equipment. The cost of the data loggers and communication devices has come down drastically with recent advances in electronics technologies, BUT equipment, which can work over an extended temperature range, are still expensive. Robust data loggers and communication devices are required which can work in extreme environments e.g., temperature and prolonged time with high humidity values.

AWS enclosure. In extreme weather areas waterproof box should be rust proof and salt resistant. Normally we go for standard IP65-66 or NEMA 4 protection grade. These enclosures should be made of suitable material or properly shielded so that inside temperature does not increase considerably, causing malfunction to the electronic equipment or batteries. High rainfall rates can cause water infiltration, so the connector and core hitches exposure to the environment mast be minimal.

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Radiation shields. Radiation shields should be rugged and allow free airflow over the sensors, so wooden or plastic Stevenson screens should be employed. Normally fan-aspirated shield are not suggested unless strictly required.

Earthing. AWS equipment is often damaged by lightning strikes. Appropriate conventional or maintenance-free earthing, could be very effective in the long run. State-of-the-art lightning arrestors together with maintenance-free earthing at the site could reduce AWS faults due to lightning.

Calibration of sensors and maintenance of stations. Tropical; mountain and dry regions have peculiar problems in maintenance of AWS sensors due to dust deposition or frost/snow damages. Though AWS are generally unmanned by design, regular visits to a site are required to check its security, exposure conditions and for performing preventive maintenance. The costs of maintenance, calibration and running expenses for an operating AWS network far outweigh the initial purchase expense, so these expenses should be kept in mind before planning the siting and installation of an AWS network. Calibration of sensors should be performed at least once or twice per year. Availability of manpower and funds are major constraints in accomplishing these tasks.

Safety. In remote regions security of AWS equipment has become a major concern. It is quite common that there are many thefts of solar panels and batteries from the AWS sites. I had experienced 2 solar panels stolen and 1 cup anemometer broken for pure vandalism, The general public now understand that solar panels and batteries can be used in domestic or mobile applications (i.e. Van, Campers). Public participation of local people and awareness programs can help to reduce these events. The participation of Non-Governmental Organizations (NGO) can be also considered.

2.5 Data Transmission

Remote data transmission is an important feature which adds more complexity to the system (Fig. 2.4). In particular it requires a careful evaluation in terms of:

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Remote data transmission
• Modem, landline phone
• Modem, cell phone
• Radio
• Meteor burst
• Geostationary satellites (Meteosat, Goes, Immarsat, Thuraya)
• Low orbit satellites (Orbcomm, Iridium…)

Fig. 2.4

Available data transmission systems

Power. It may be one of the option of the system that drains the most current, especially during data transmission).

Cost of the equipment (modem, antenna, improved power supply…).

Cost of data transmission (i.e. future sustainability).

Routine checks towards provider for GSM/GPRS or satellite services, i.e. available credit on the SIM for each contract (each station + base station); GSM/GPRS tariffs, comparison of the expected cost to the invoices received.

Once the site of installation has been accurately identified, a specific selection of the telemetry option can be based upon:

Presence of an affordable phone landline at the site of installation.

GSM-GPRS/CDMA cell phone coverage at both the site of observation and at the base station.

Radio frequency availability and license restrictions. Distance of the observation sites from the base station. (Signal repeaters required?).

RAWS Management

The WMO ET-AWS 5 (2010 established a list of advances and limitations in AWS technology. The main advances concern telecommunications means and ability of internal diagnostic to optimize the maintenance. RodicaNitu of Environment Canada reported that the decreasing cost of an AWS make them more affordable and attractive, however, it has to be recognized that the cost of AWS stations remains marginal compared to the initial and running costs of a network. It is mandatory to evaluate this aspect to avoid useless investments by lack of subsequent network management, maintenance, calibration and training.

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There is a wide range of configurations of AWSs for surface measurements available; high end systems (e.g. for airport, climate, micrometeorological applications) are most often user specific configured. This foresees trained local personnel to manage the equipment.

The customers may tend to choose a turnkey system managed by a third party (manufacturer, local agent/distributor), if they cannot rely on trained personnel. The RAWS maintenance is the first aspect to be taken into account; type and number of sensors to be choose is fundamental in the planning phase. As far as I know, there is no maintenance-free automatic weather equipment but we can work at reducing the inspections operations selecting appropriate sensors, as discussed in the RAWS configuration paragraph above.

No moving parts is one of the best features of a sonic anemometer because it reduces failures typical of the traditional cup anemometers. Non-catchment rain gauge type represents an alternative to standard rainfall collector for long time deployment in remote sites, even if the scientist are still validating their responses against field reference systems. Inter comparison campaigns organized by WMO show interesting perspectives for their use in multiple precipitation regimes: rainfall, snow, mixed rain-snow, drizzle, etc. The absence of a collector and/or moving parts led to more reliable observations, maybe of less accuracy, but less affected by some error source.

The operational procedures within a NMHS are a set of processes relating to both institutional and technical management aspects. In this context, the leadership shall be aware of the importance of implementation of the remote sites monitoring network in their observation network (Hall 2007). To help improve AWS's management I would recommend the following to those who are responsible of the observation network.

8. Period required for completion of Project: 3 Years will continue for successful conduction
9. Budget Estimate

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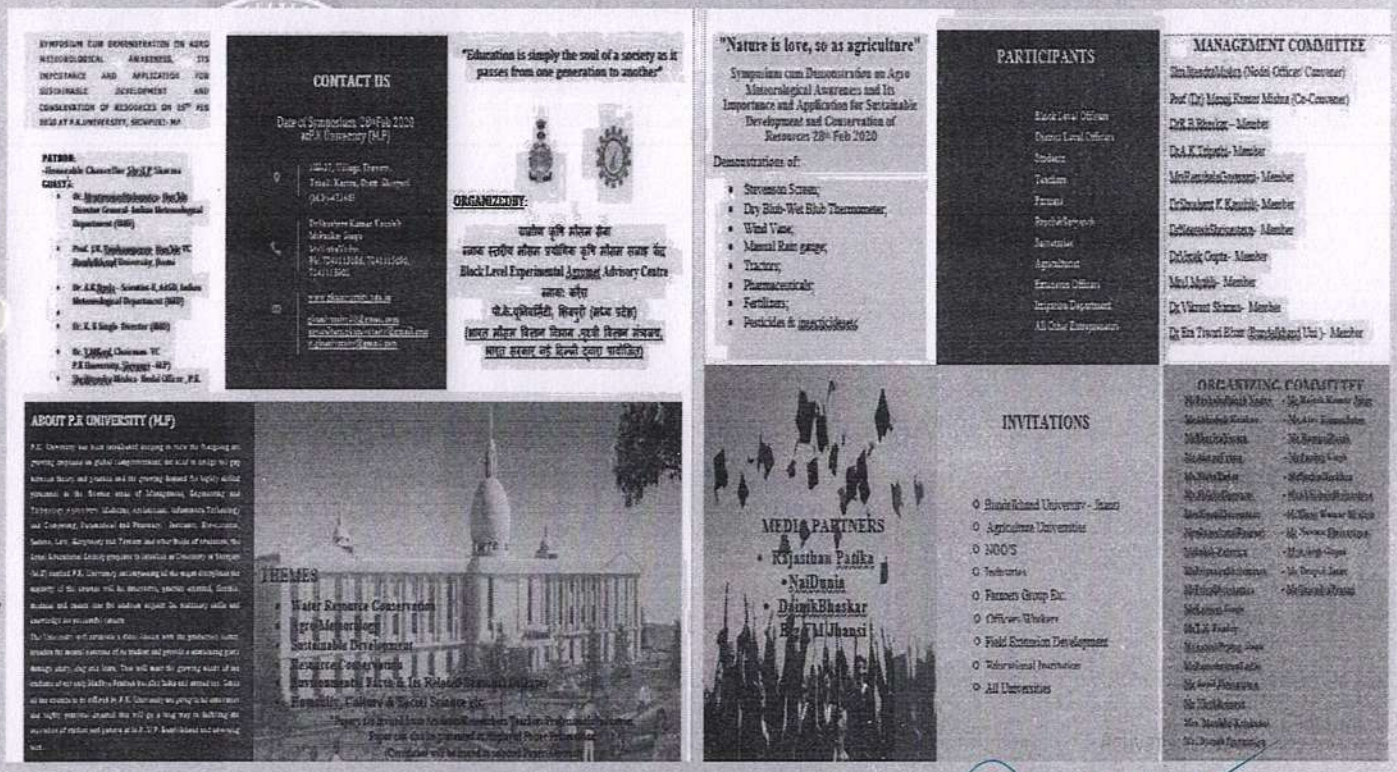
Non-Recurring (*Equipment*)

S.No	Name of Equipment/Facilities to be procured	Specifications of equipment	No. of Units	Estimated cost as on date
	Automatic Weather Station (AWS)	As per Indian Meteorological Department (IMD) specification	1	Provision from Indian Meteorological Department (IMD)

Glimpse of the Symposium Organized by P.K. University, Shivpuri (M.P) on 28th Feb 2020

Brochure:



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Date 14.03.2020

DECLARATION & ATTESTATION

I/We accept the terms and conditions for IMD research grants, all the guidelines issued by IMD from time to time we will abide by the same. Necessary Institutional facilities will be provided if the research proposal is approved for financial assistance.

I also declare that no funding is applied or taken from any other agency for the same/similar project. Full audited account of expenditure and utilization certificate will also be rendered by the Institution.

Signature of Principal Investigator

Signature of Executive Authority of Institute with Seal

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