



AUTOMATIC

WEATHER

STATION

(AWS)

OVERVIEW

The state of Meghalaya is globally known for harbouring the wettest place on earth. With an area of approximately 22,430 sq. kms and elevations ranging between 150m – 1961m, it receives an average annual rainfall as high as 12,000 mm in some areas.

The state is home to 29, 64, 007 inhabitants in approximately 6800+ villages and with agriculture as its primary occupation, the majority of the population depend entirely on the climate and its elements for their livelihood. The state is rich in biodiversity in flora and fauna particularly in the agricultural and horticultural sector but even with the amount of rainfall that the state receives annually, the production is still deemed low and time and time again, the state has not been able to meet the demands of the growing population and still rely on imported food products. The changing climate, unsustainable farming practices, limited access and use of scientific and modern methods of cultivation etc are a few key factors which inhibited and limited this sector from progressing forward.

It is a known fact that farmers have now opted to change their livelihood to other income-generating activities due to climate variability and change. Unexpected onset of rainfall, hail stones, storm, flood, drought and other climatic factors have been found to have a negative impact on the vulnerable farming community due to the lack and access to local or community climate-information services. Such services if existed will enable farmers to make informed decisions, better manage risks, take advantage of favourable climate conditions and adapt to change.

ABOUT THE AWS

Automated Weather Station or AWS is a compact, diminutive meteorological station at which observations, information and measurements are made and transmitted automatically and made available at real time.

The AWS is capable of recording various meteorological elements such as temperature, precipitation, humidity, atmospheric pressure, wind speed, solar radiance etc in an area. The stations are primarily installed in remote locations or inaccessible locations to study atmospheric conditions and to provide weather-related information in an area. The atmospheric measurements are made possible through the use of various sensors which are attached to the station for each parameter.

COMPONENTS OF THE AWS

A typical Automated Weather Station System consists of:

- 1) **Sensors:** These are the sensing instruments which are designed for each individual weather parameter. The sensors are the point of contact which converts measurements of meteorological elements into electrical signals.
- 2) **Data logger:** It is the heart of the station which processes, store and transmit collected data. Information is made possible and accessed by a personal computer, distances away from the station with the use of this device.
- 3) **Power Supply:** The AWS are mostly solar powered with one or more rechargeable batteries. The stations are designed to be self-powered with the ability to withstand changing atmospheric conditions minimising human intervention for maintenance and management.
- 4) **Mounting stand:** The station is required to be mounted a few feet above ground or at a standard height to minimise errors in measuring data which can be caused due to radiating heat from the ground or bouncing rain water droplets off the ground. The height is also important for the station to gather precise air temperature, wind speed, precipitation data etc and to avoid significant uncontrollable errors from surrounding structures where the station is installed.

DATA TRANSMISSION

The AWS is in itself not a single system but in fact makes up a system comprising of 3 components that is the collection system, the transmission system and the processing system,

The AWS acts as the primary data collection system, storing all the relevant meteorological information before its transmission. Data which is collected and stored using the data logger can be transmitted automatically via satellite or telecommunication cellular forming the transmission system. Whatever data that is transmitted, the information is then fed to a server and accessed by a computer which analyses and processes all the data received after its transmission.

ESTABLISHMENT OF DATA CENTRE

Data which are collected and stored using the data logger can be transmitted automatically via GPS/GPRS/satellite Technology or telecommunication cellular forming the transmission system. Whatever data that is transmitted, the information is then fed to a server and accessed by a computer which analyses and processes all the data received after its transmission. Establishment of such Data Centre within MBDA is prerequisite. Such data can also be shared with the farming community in the form of weather advisories to enable them to plan their planting as well as harvesting time to prevent damage/loss.

PURPOSE AND ADVANTAGES OF USING AWS

- 1) Providing meteorological data from sites which are difficult to access and are inhospitable;
- 2) Supplying and collecting data 24 hours;
- 3) Weather parameters can be added with the attachment of more sensors
- 4) Standardizing the method of the data measurement and collection ensuring homogeneity;
- 5) Human errors of data collection and delivery is greatly reduced;
- 6) Measuring and reporting with high frequency or continuously;
- 7) Real time weather advisories to farmers/users once standardized
- 8) Near accurate assessment of resource availability at places near the AWS sites.