

SURFACE, CLIMATE AND UPPERAIR OBSERVATIONS SYSTEM IN PAKISTAN

(submitted by MUHAMMAD TOUSEEF ALAM, Pakistan Meteorological Department)

Summary and Purpose of Document

The purpose of this document to illustrate the existing surface and upper air observational network of Pakistan Meteorological Department. It also explains the type of observing station and timing of the observation. A brief about techniques and procedures being adopted for the QC applied at different levels, at the observing station, in the data processing centre, communication centre, data archive/dissemination centre has been given. Meteorological and observational training being imparted has also been included.

COUNTRY REPORT

ON

**SURFACE, CLIMATE AND UPPER-
AIR OBSERVATIONS SYSTEM IN
PAKISTAN**

BY

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**JMA/WMO WORKSHOP ON QUALITY MANAGEMENT IN SURFACE, CLIMATE AND
UPPER-AIR OBSERVATIONS IN RA II (ASIA)**

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1. Observation networks

1.1 Surface observations

1.1.1 Number of stations: RBSN, RBCN, GSN, manned stations and AWS*

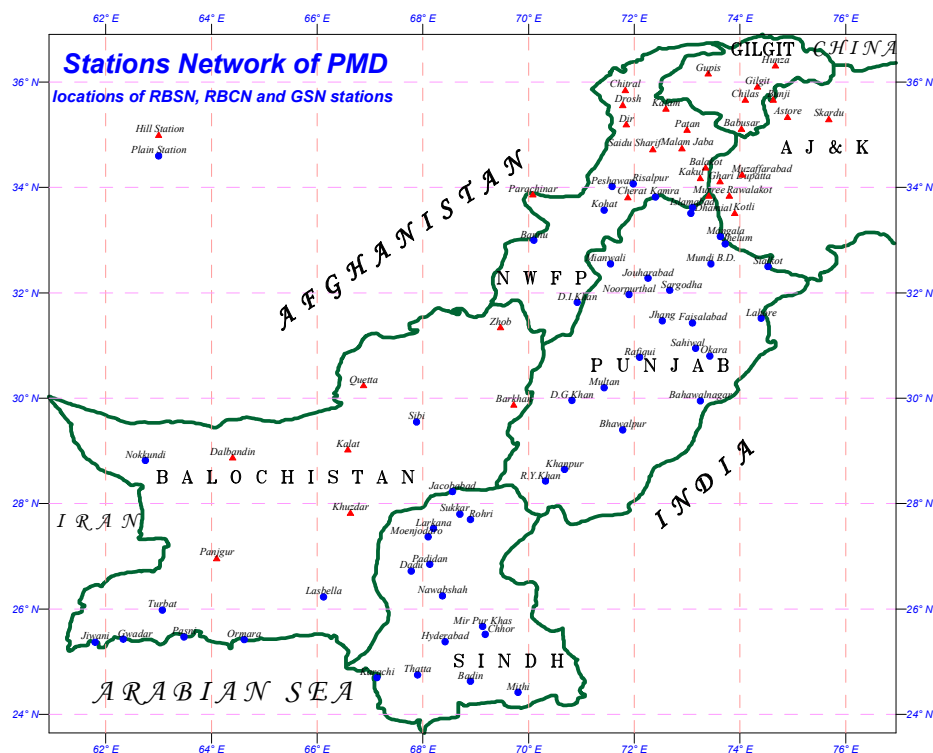
Table 1 Number of stations

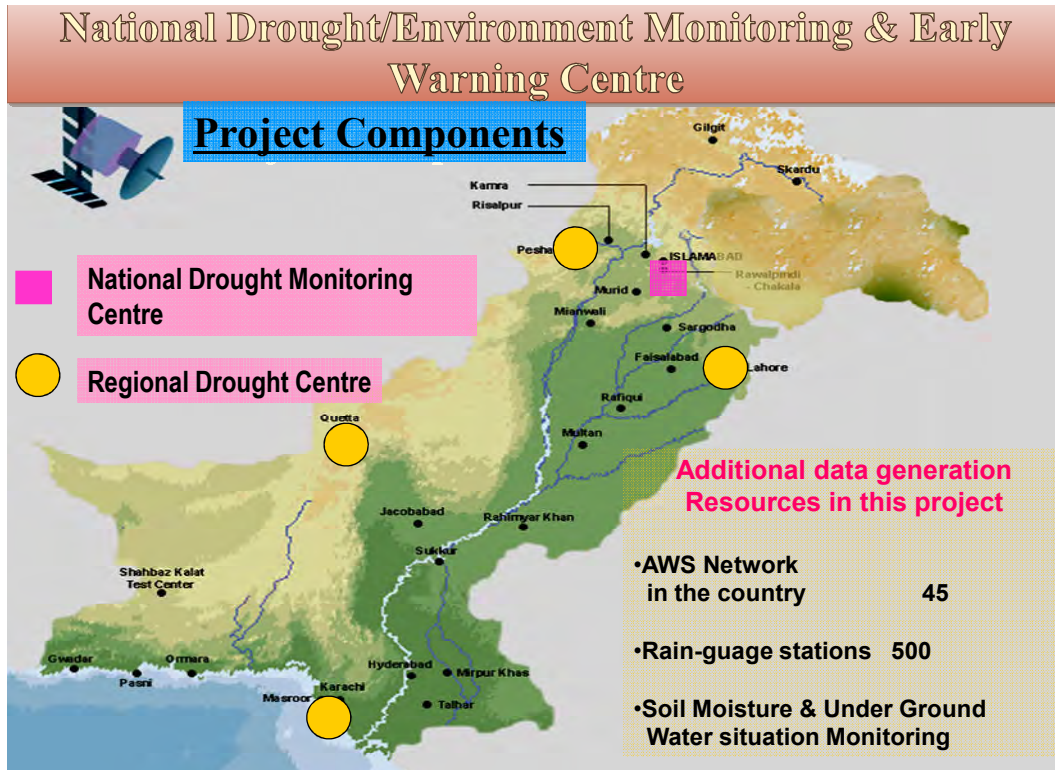
	RBSN	RBCN	GSN	Manned stations	AWS *
number	92	55	6	-	50

* An automatic weather station (AWS) is defined as a “meteorological station at which observations are made and transmitted automatically”.

1.1.2 Station map

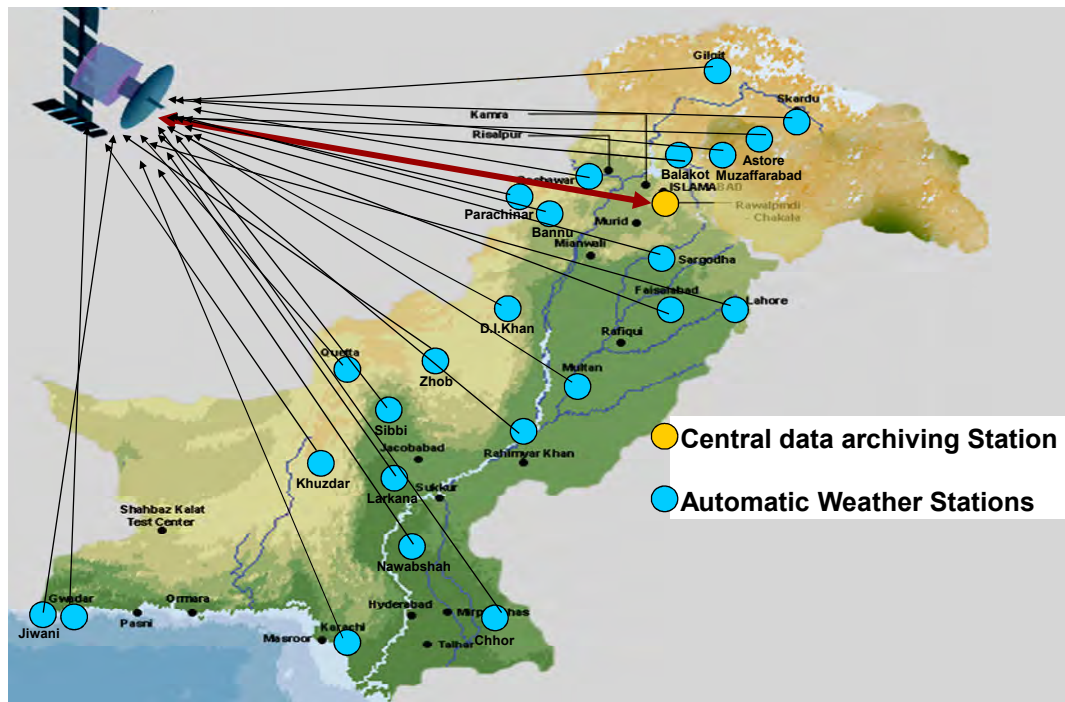
Map showing locations of the PMD RBSN, RBCN and GSN stations





Map showing locations of PMD AWS

Automation of Meteorological Observing Network



PAKISTAN RAINGAUGES NETWORK

NWFP RAINGAUGES NETWORK

BALUCHISTAN RAINGAUGES NETWORK

PUNJAB RAINGAUGES NETWORK

SINDH RAINGAUGES NETWORK

Map of Pakistan showing the Rain Gauges Network. The map displays the four provinces: Baluchistan, NWFP, Punjab, and Sindh. Numerous rain gauge stations are marked with green dots across the country. Major cities and towns are labeled, including Quetta, Islamabad, Lahore, Karachi, and Rawalpindi. The network is dense in the northern and eastern regions and sparser in the western and southern regions. Arrows point from the network name to the respective provincial areas.

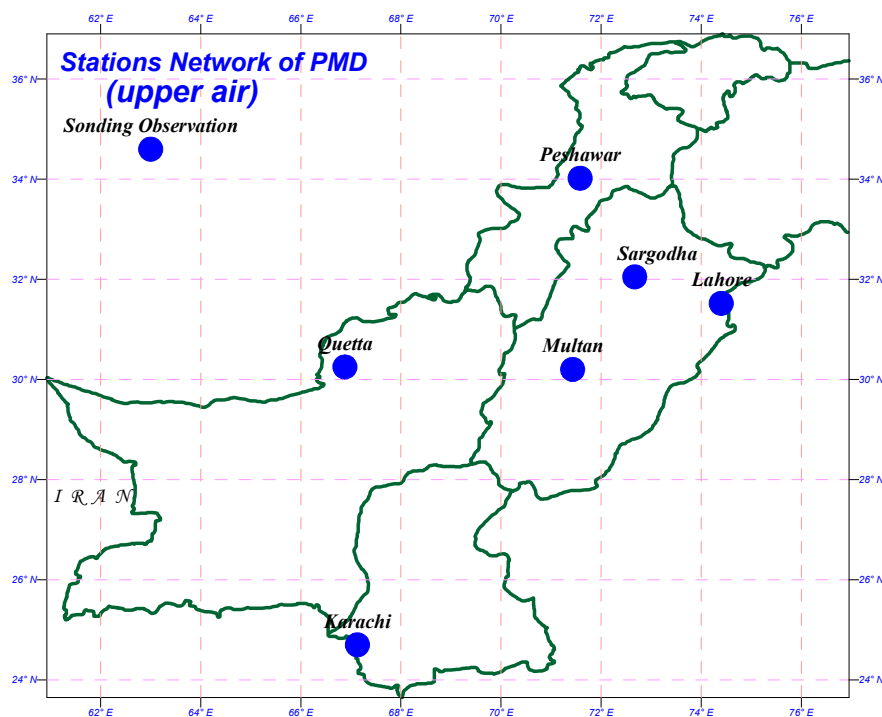
00 UTC 03 UTC 06 UTC 09 UTC
12 UTC 15 UTC 18 UTC 21 UTC

Surface observation data flow to users and archives is expected to be described with an illustration.

1.2.1 Number of stations: RBSN, RBCN, GUAN, manned stations and automated system stations

	RBSN	RBCN	GUAN	Manned stations	Automated system stations
number	6	3	0	-	-

A map showing locations of the RBSN, RBCN and GUAN stations for upper-air observations are expected.

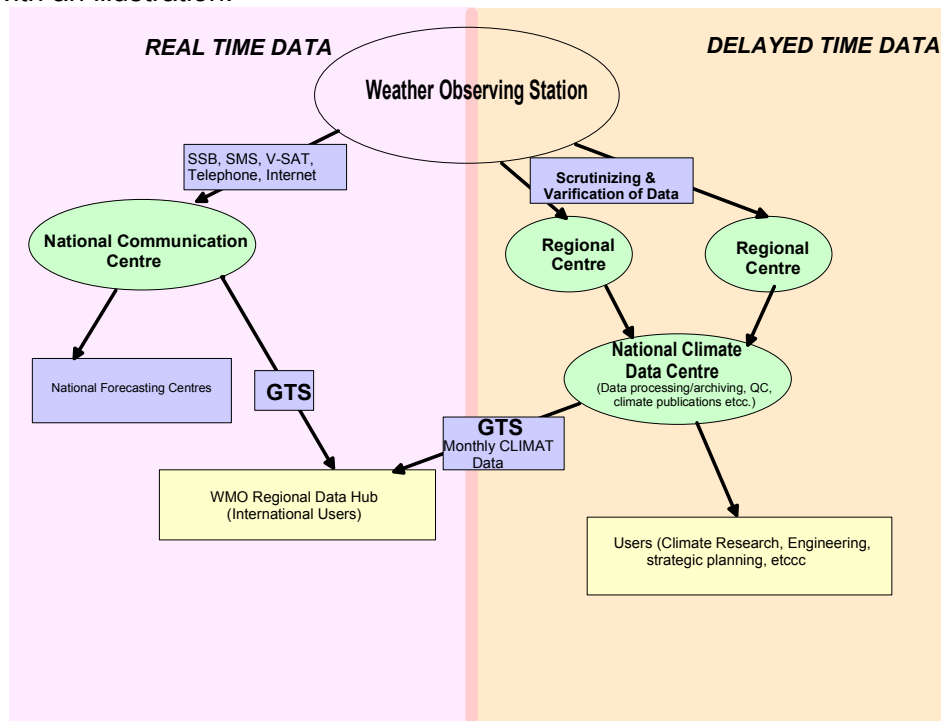


1.2.3 Time and frequency of observations

One (1) time per day:
00 UTC

1.2.4 Data flow to users and archives

Upper-air observation data flow to users and archives is expected to be described with an illustration.



2 Siting and metadata

Example of metadata:

STATION NAME	KARACHI (AIRPORT)
WMO NO	41780
ICAO ID	OPKC
ESTABLISHED	1928
LATITUDE	24° 54' N
LONGITUDE	67° 08' E
HEIGHT OF BAROMETER CISTERN AMSL	0073 ft (0022 m)
HEIGHT OF STEVENSON SCREEN AMSL/AG	0069 ft (0021 m) , 1.2 m
HEIGHT OF ANEMOMETER ABOVE GROUND	0023 ft (0007 m)
ELEVATION	21 m
TYPE OF STATION	HILLY/PLAIN

3 Instruments, sensors, upgrade, maintenance, instrument intercomparisons and traceability

Due to financial constraints often problems arise in terms of instruments/sensors, up gradation or replacement. Repair, maintenance intercomparisons of instruments and sensor are being carried out by trained PMD personnel at stations or at regional centers.

4 Quality assurance / quality control (real-time, non-real time)

At the observing station, officer in-charge compares and checks the data thoroughly before dissemination to National Meteorological Communication Centre. Moreover, this data is further scrutinized at Data Processing Centre, If respective Director of Regional Center feels any fault occurred in the equipment(s) then they send inspector to find out the cause of error(s) in the equipment(s) and inspector removes the defect(s) on the spot (if any)

QC result generally communicated via various means of communication(s) Viz, phone, fax, email, SSB, VSAT etc. Fault/error may be rectified by verbal instruction to the officer in-charge of the observatory, otherwise inspector of the respective RC visited the observatory and he takes the remedial and necessary action

5 Training

Pakistan Meteorological Department (P.M.D) offers professional training courses in various branches of Meteorology, Geophysics and allied sciences at the Institute of Meteorology and Geophysics (I.M.G), Karachi. The courses are of various levels and are designed for the new comer to meteorology as well as for those who have acquired sufficient experience in the field and require higher training. The syllabi of courses provided at the Institute have been prepared mainly according to the pattern recommended by the **World Meteorological Organization (W.M.O.)**. The courses aim to provide both theoretical and practical background to a student and to equip him fully for the job one is to take up after completion of the training. Lectures by specialists are also arranged from time to time. Revision of necessary topics in Physics and Mathematics is included in the regular courses. The Institute has its own library and a good collection of textbooks are available for the benefit of

the students. New books and publications are added from time to time. The Institute also has well equipped computer laboratory.

6 Statistics and applications

Description of statistics and application for surface and upper-air observations:

- Aeronautical Forecast and Warning services for Aviation.
- Flood Forecast and Warning Service.
- Farmer's Weather Bulletins and Warning Services
- Public Utility and Advisory Services in various fields of :
 - Planning and Development
 - Town Planning
 - Construction: Road, Bridges, Aerodrome, Power Plant, Air-conditioning etc.
 - Provision of Meteorological/Geophysical data for Court cases, Insurance Claims, Enquiry Reports, and District Gazetteers etc.
- Marine Met. Forecast and Warning Services.
- Air Pollution Monitoring services.
- Research activities in the following disciplines:
 - Meteorology
 - Climatology
 - Hydrology
 - Oceanography
 - Atmospheric Physics
 - Environmental Pollution
 - Geophysics
 - Agricultural Meteorology

7 Current issues and future plan

- Expansion of more data observing network
- Up gradation of existing observing stations.
- Installation of more AWS
- Increase in the more observational hours (24 observations per day)