SURFACE, CLIMATE AND UPPER-AIR OBSERVATIONS & TRAINING SYSTEM IN PAKISTAN

MUHAMMAD TOUSEEF ALAM

Director

Pakistan Meteorological Department

http://www.pakmet.com.pk

E-mail : touseefalam@yahoo.com

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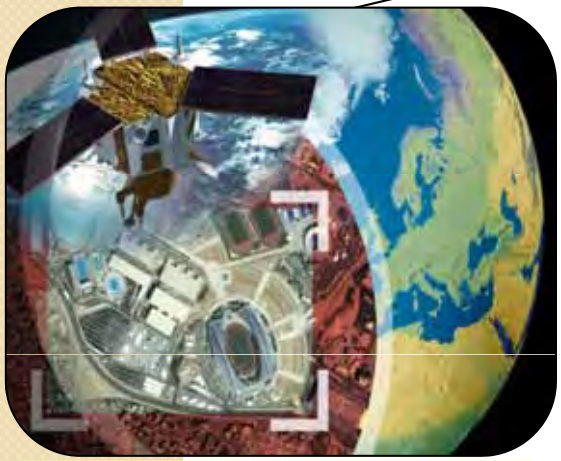
PMD PRESENT SERVICES



Meteorology

Hydrology

Seismology

OBJECTIVES & RESPONSIBILITIES

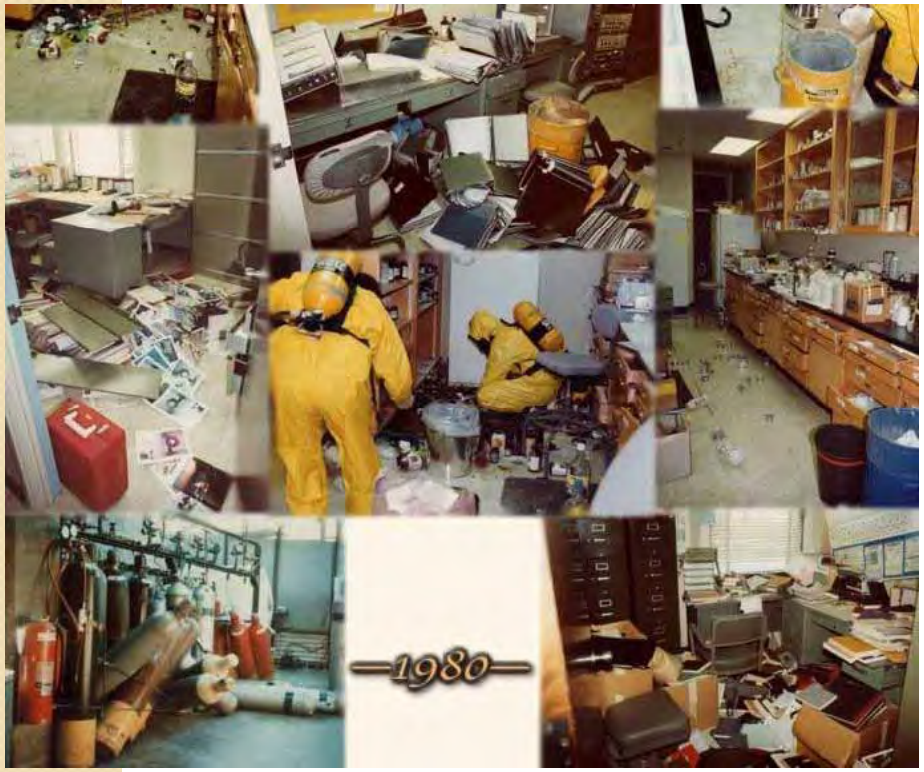
- To ensure timely issue of different types of weather/flood forecasts, warnings and advisories to the National News Media and concerned functionaries.

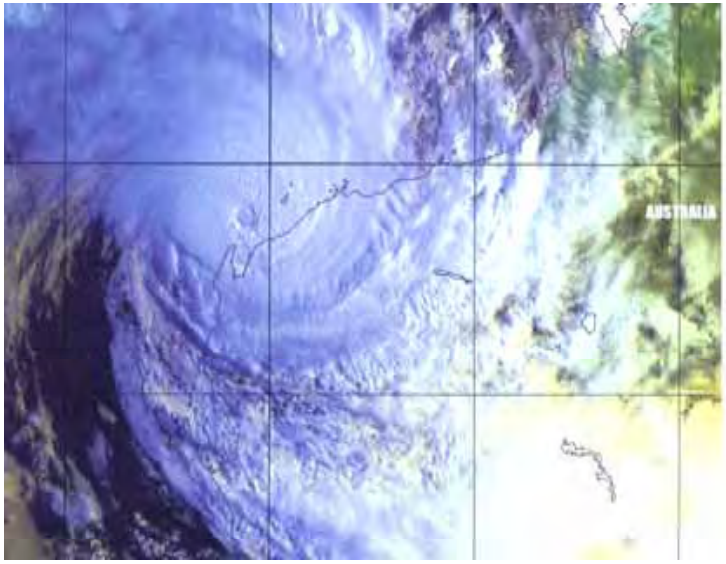
OBJECTIVES & RESPONSIBILITIES

- **Safety of civil aviation operations, VVIP flights and marine activities.**

OBJECTIVES & RESPONSIBILITIES

- **Mitigation of disasters due to Meteorological, Hydrological & Geophysical Phenomena such as Tropical Cyclones, Heavy Rains, Floods & Earthquakes etc.**

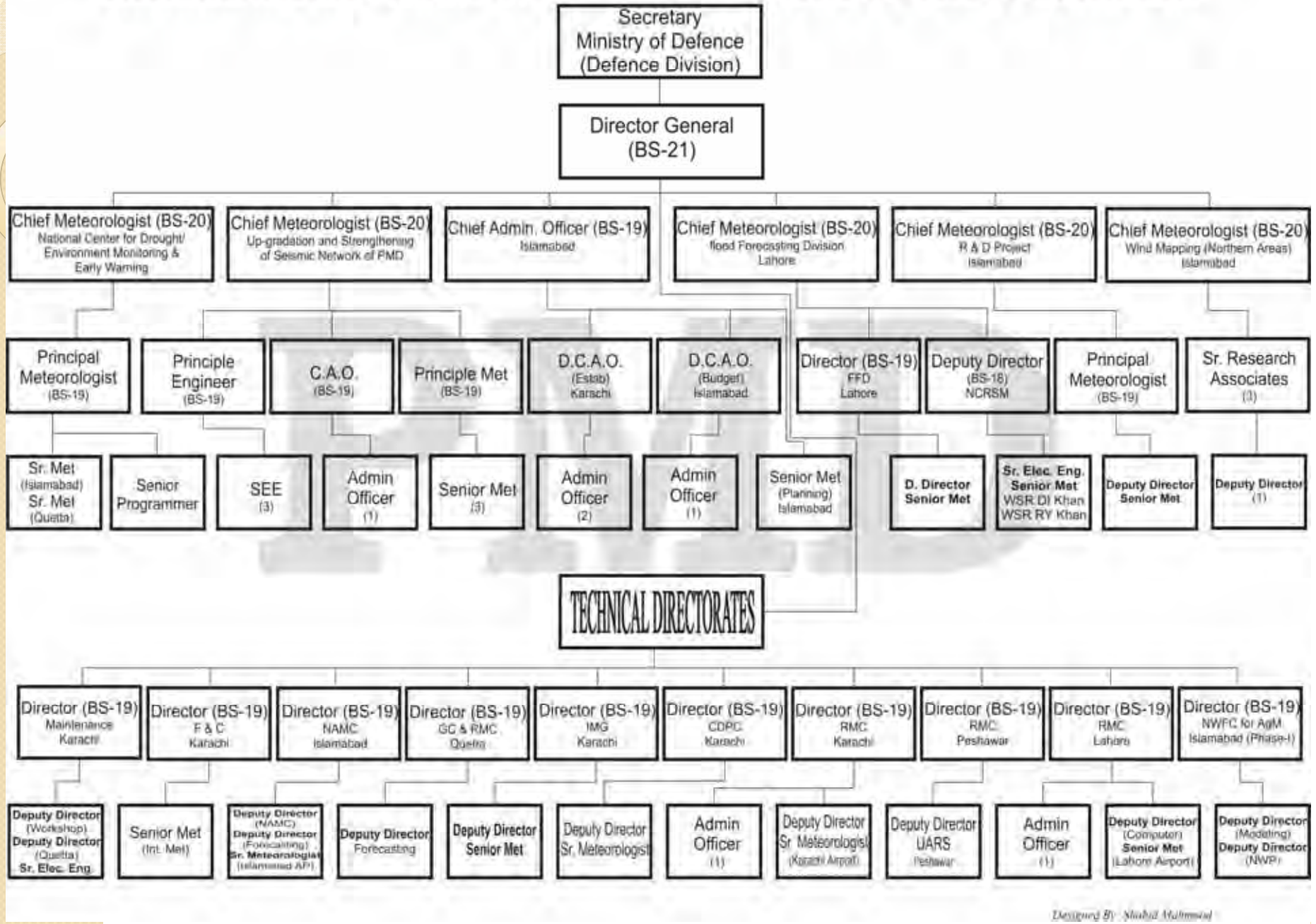




OBJECTIVES & RESPONSIBILITIES

- **Socio-Economic Development of the country based on climatic and agro-climatic potentials of different areas.**
- **Boosting-up of Agricultural Productivity of the country by providing agromet services to the farming community.**
- **To investigate the behavior of the atmosphere and exploiting this knowledge for short and long term weather predictions.**

ORGANIZATIONAL CHART OF PAKISTAN METEOROLOGICAL DEPARTMENT



MAIN AREAS OF OPERATION

1. AVIATION METEOROLOGICAL SERVICES.
2. HYDRO-METEOROLOGICAL SERVICES AND FLOOD FORECASTING.
3. AGRO-METEOROLOGICAL SERVICES.
4. CLIMATOLOGICAL SERVICES.
5. GEOPHYSICAL AND SEISMOLOGICAL SERVICES.
6. WEATHER FORECASTING SERVICES TO PUBLIC THROUGH ELECTRONIC & PRINT NEWS MEDIA.
7. ASTRONOMICAL INFORMATION SERVICES.
8. MET-FORECAST FOR MOUNTAINEERING EXPEDITION.
9. MARINE METEOROLOGICAL SERVICES.

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.).

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Training

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

METEOROLOGICAL TRAINING ACTIVITIES IN PAKISTAN

continue

TRAININGS AT PMD

INSTITUTE OF METEOROLOGY AND GEOPHYSICS

- Established in 1960, provide training to serving personnel and also to persons belonging to other government departments. Trainees from meteorological services of other countries are also welcome

continue

TRAININGS AT PMD

- **Aim:**
  - To improve Weather services through education and training.
- **Object:**
  - Provide in service training to new entrants and existing staff of the Pakistan Met. Department in observational method, techniques & procedure in basic meteorology, elementary Climatology, Met instruments, weather forecasting etc.
  - Promote public awareness regarding Meteorology.

continue

TRAININGS AT PMD

Regular Course

- Advance Met.Course
  (52 weeks)
- Basic Forecasting Course
  (32 weeks)
- Preliminary Met. Course
  (18 weeks)
- Initial Met. Course
  (14 weeks)

Special Courses

(6 to 10 weeks)

- Seismology & Geomagnetism
- Marine Meteorology
- Agricultural Meteorology
- Hydrometeorology
- Satellite Meteorology
- Radar Meteorology
- Radiosonde Meteorology
- Inspection & Maintenance of Observatories

continue

TRAININGS AT PMD

- **MASTER IN METEOROLOGY PROGRAM**

Recently *MS Meteorology Program* has been commenced with collaboration of PMD and COMSATS Institute of Information Technology, Islamabad. The *MS Meteorology Program* has been started from February 7, 2005

continue

TRAININGS AT PMD

Preliminary Meteorology Course

The course specially meant for meteorological observer for updating & enhancing their knowledge about surface & Upper air observation.

- Physics
- Mathematics
- Earth Science
- Meteorology-I
- Meteorology-II
- Meteorological Instruments
- Surface Observations and Codes
- Upper Air Observations
- Elementary Map Analysis
- Computer Practicum.

continue

TRAININGS AT PMD

The course specially meant for meteorological observer for updating & enhancing their knowledge about surface & Upper air observation.

Initial Meteorology Course

- Review of Physics
- Review of Mathematics
- Elements of Earth Science
- General Meteorology
- General Climatology
- Meteorological Instruments
- Methods of Surface Observations & Code
- Plotting of Weather Maps and Charts
- Tabulation and Compilation of Data
- Introduction to Computer Systems

Training Facilities for Neighbouring Developing Countries

Meteorological Training Facilities for Neighbouring Developing Countries

Pakistan Meteorological Department has been extending its training facilities to the National Meteorological Services (NMSs) of the neighbouring countries for their capacity building through WMO Voluntary Programme.

Main purposes of this training course are to; improve the professional skills of Met. personnel both in theoretical and practical, collect meteorological data, operate and maintain meteorological instruments, compile and process meteorological information, undertake climatological research studies in order to assist weather forecasting tasks etc.

continue

Meteorological Training Facilities for Neighbouring Developing Countries

For this purpose, PMD has conducted Preliminary Meteorology Courses under Basic Instruction Package for Met Technician Programme (BIP-MT Programme) which is equivalent to WMO level III course. This programme was started in 2008 and 2009 at Institute of Meteorology & geophysics, Karachi.

The third such training course is recently commenced and is in progress at IMG, Karachi.

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Meteorological Training Facilities for Neighbouring Developing Countries

In 2008 ten trainees (2 each from Bangladesh, Maldives, Sri Lanka, Bhutan and Nepal) had attended the training

continue

Meteorological Training Facilities for Neighbouring Developing Countries

In 2009 eleven trainees (2 each from Bangladesh, Myanmar, Sri Lanka, Bhutan and Nepal & one from Afghanistan) had attended the training

continue

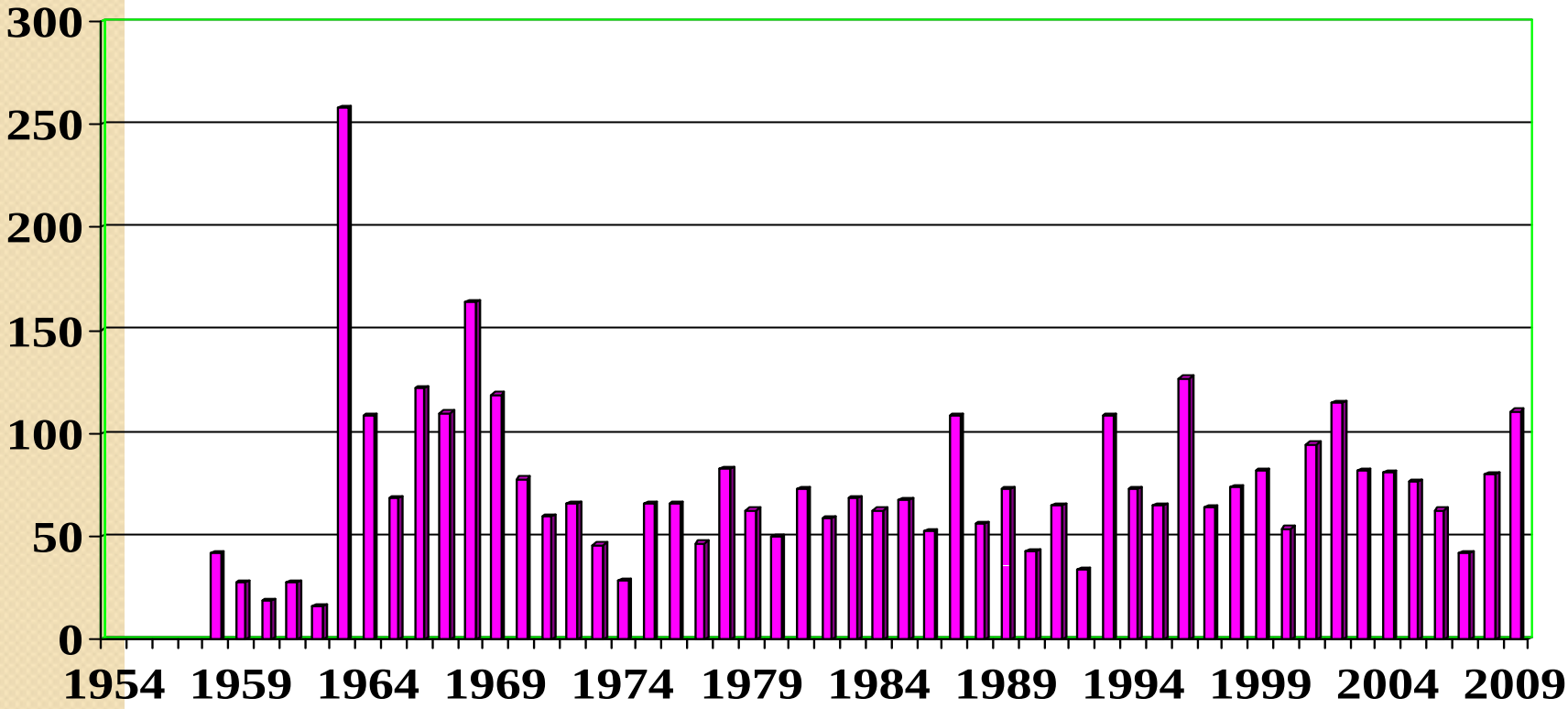
Meteorological Training Facilities for Neighbouring Developing Countries

At present, 10 trainees (two each from Bangladesh, Nepal, three from Bhutan and three from Sri Lanka) are attending the training this year.

PERSONS TRAINED UPTO 2009

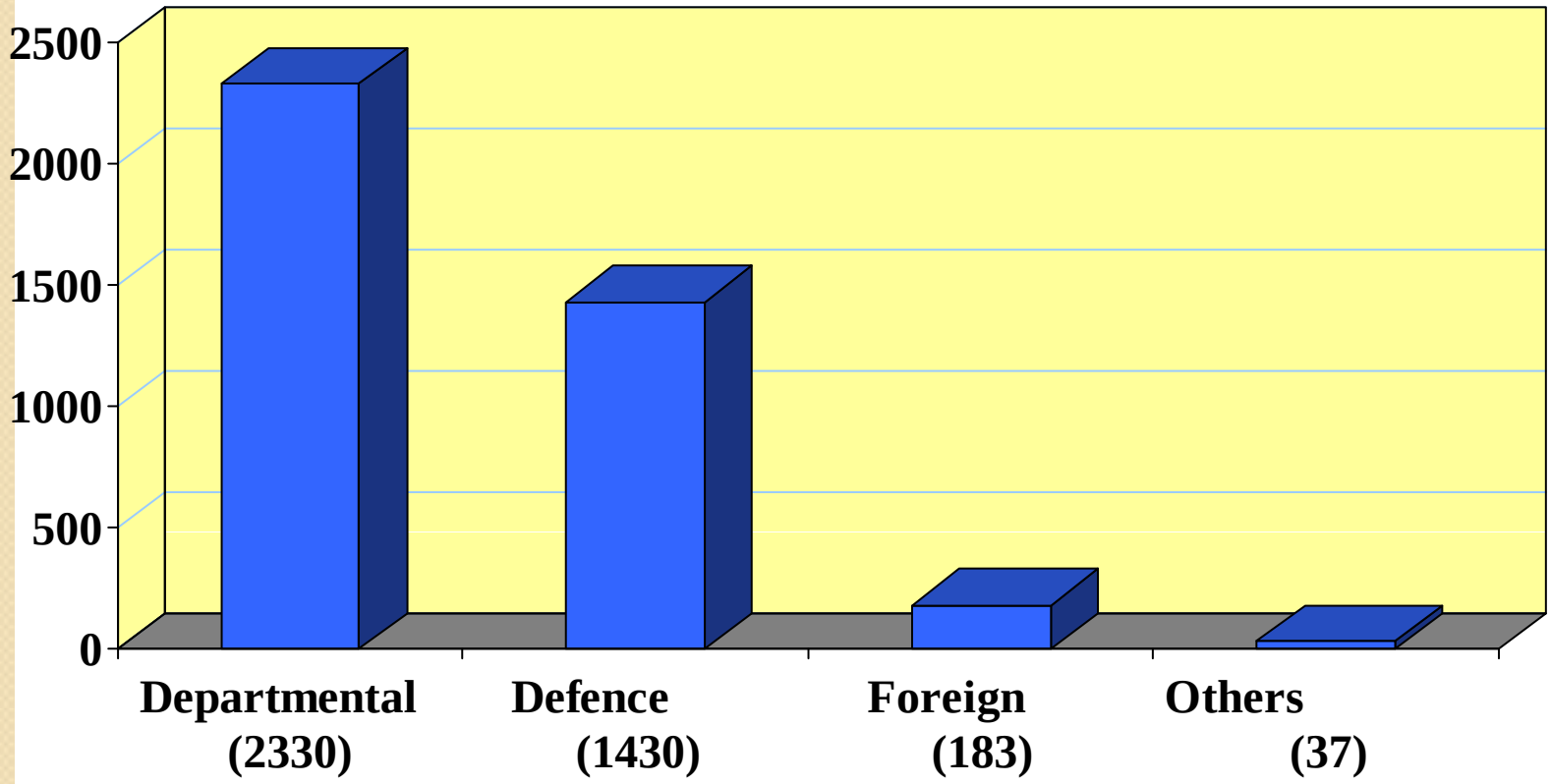
(Year by Year)

TOTAL: 3980

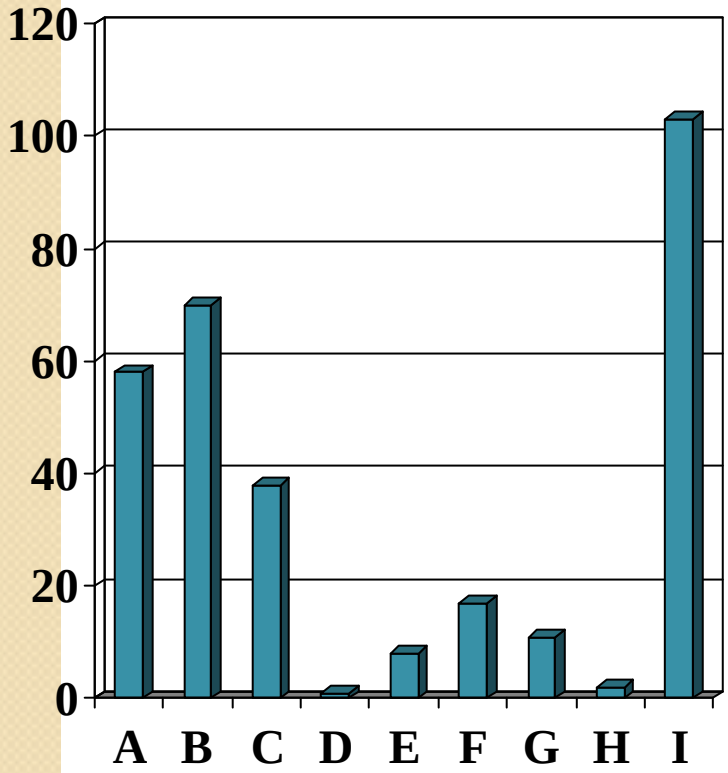


INSTITUTE OF METEOROLOGY AND GEOPHYSICS

Training received by Departmental & other organization



Courses conducted up to 2009

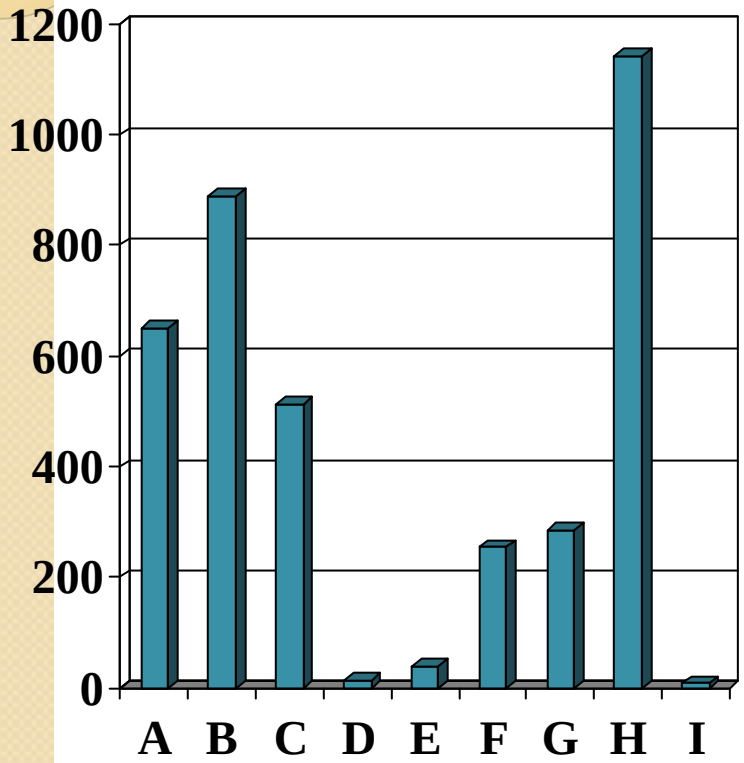


A : Initial Met. Course (58)
B : Preliminary Met Course (70)
C : Basic Forecasting Course (38)
D : Advance Met. Course (01)
E : Special Seismology Course (08)
F : Special Advance Course (17)
For Air Force Personnel
G : Primary Met Course (PAF) (11)
H : Higher Primary Met Course (02)
I : Other Special Courses (103)

Total : 309 Course

INSTITUTE OF METEOROLOGY AND GEOPHYSICS

Persons Trained in each course up to 2009



A : Initial Met. Course	(650)
B : Preliminary Met Course	(889)
C : Basic Forecasting Course	(514)
D : Advance Met. Course	(14)
E : Special Seismology Course	(39)
F : Special Advance Course For Air Fore Personnel	(254)
G : Primary Met Course (PAF)	(286)
H : Other Special Courses	(1143)
I : Post Graduate Diploma in Meteorology	(9)

Total : 3950 Persons

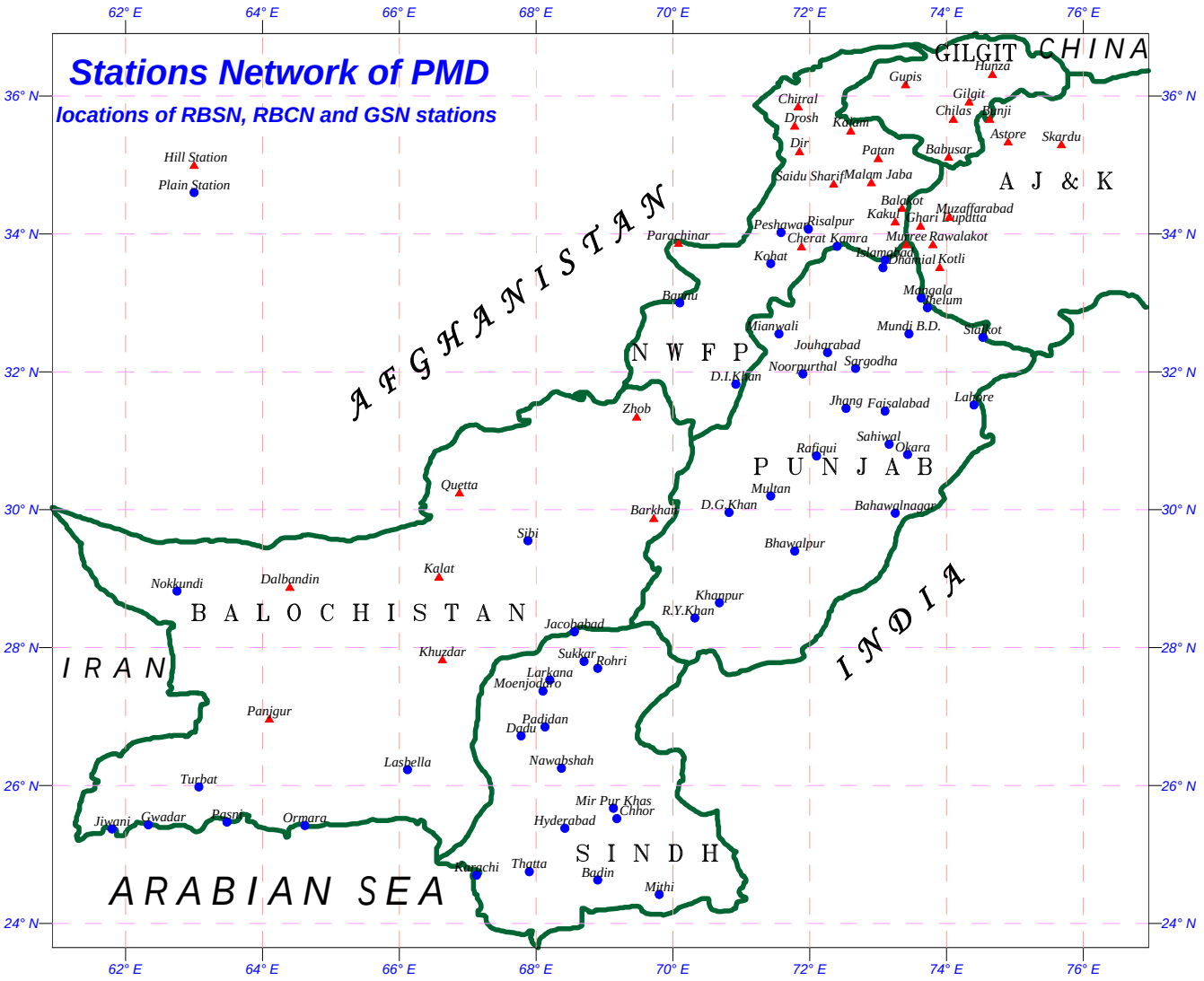
Extreme weather events

- Highest recorded temperature **53.0 ° C** at TURBAT on July 3, 2002.
- Lowest recorded temperature **-24.1 ° C** at SKARDU on January 1. 1995.
- Heaviest rainfall in a day **591.9 mm** at ISLAMABAD on July 24, 2001.

SURFACE
RBSN, RBCN, GSN, manned stations and AWS

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

RBSN Stations

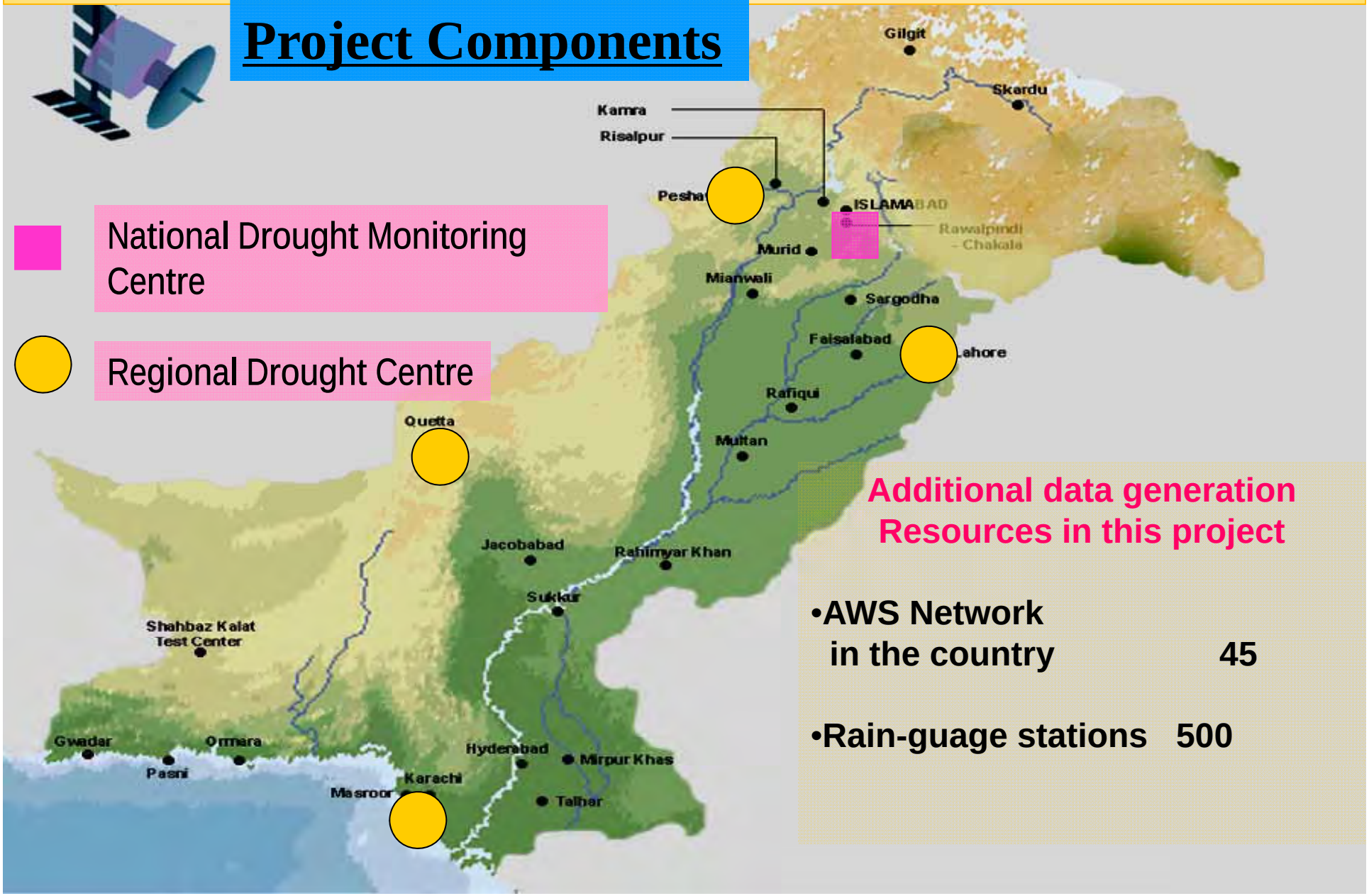


National Drought/Environment Monitoring & Early Warning Centre

Project Components

National Drought Monitoring Centre

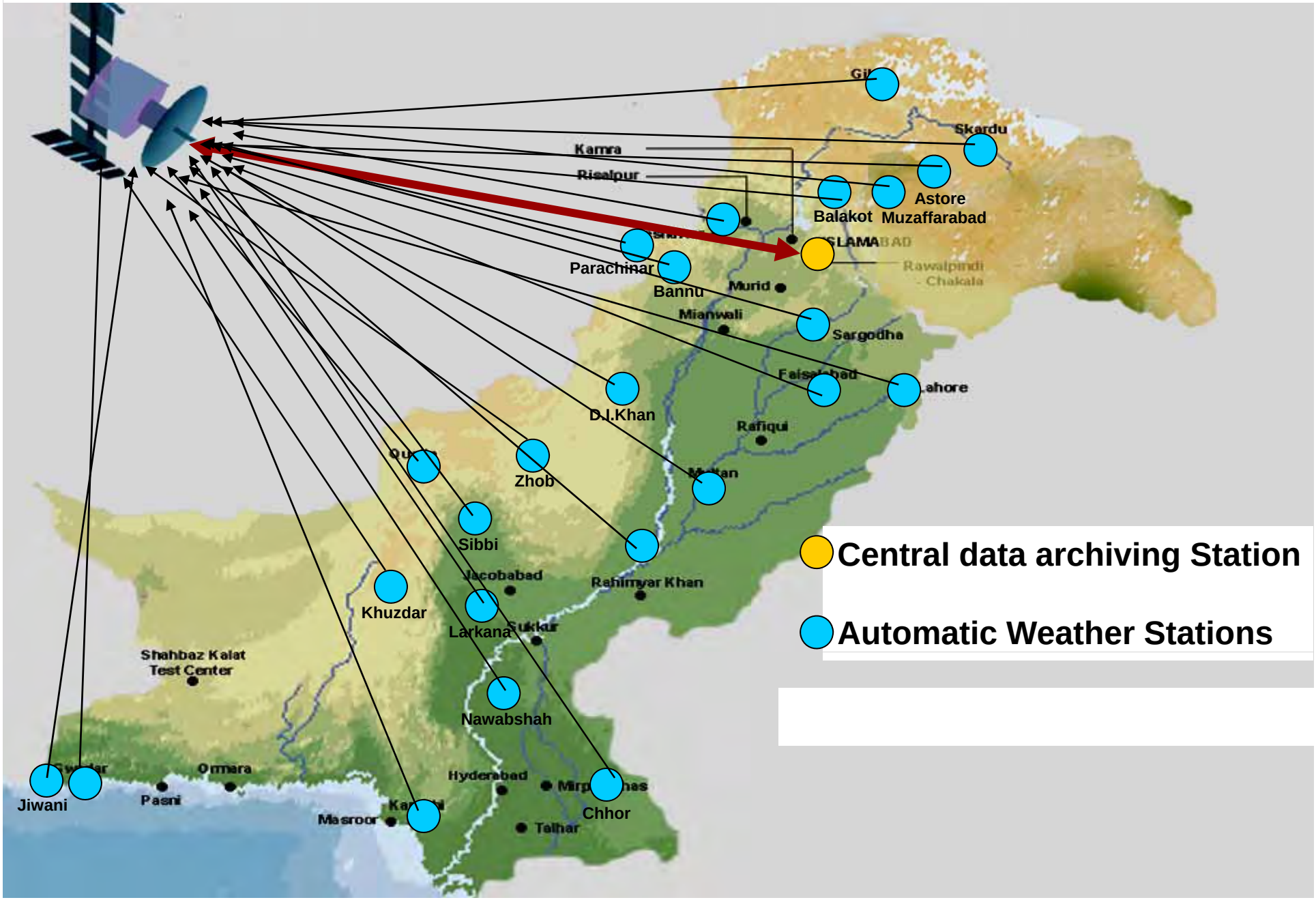
Regional Drought Centre



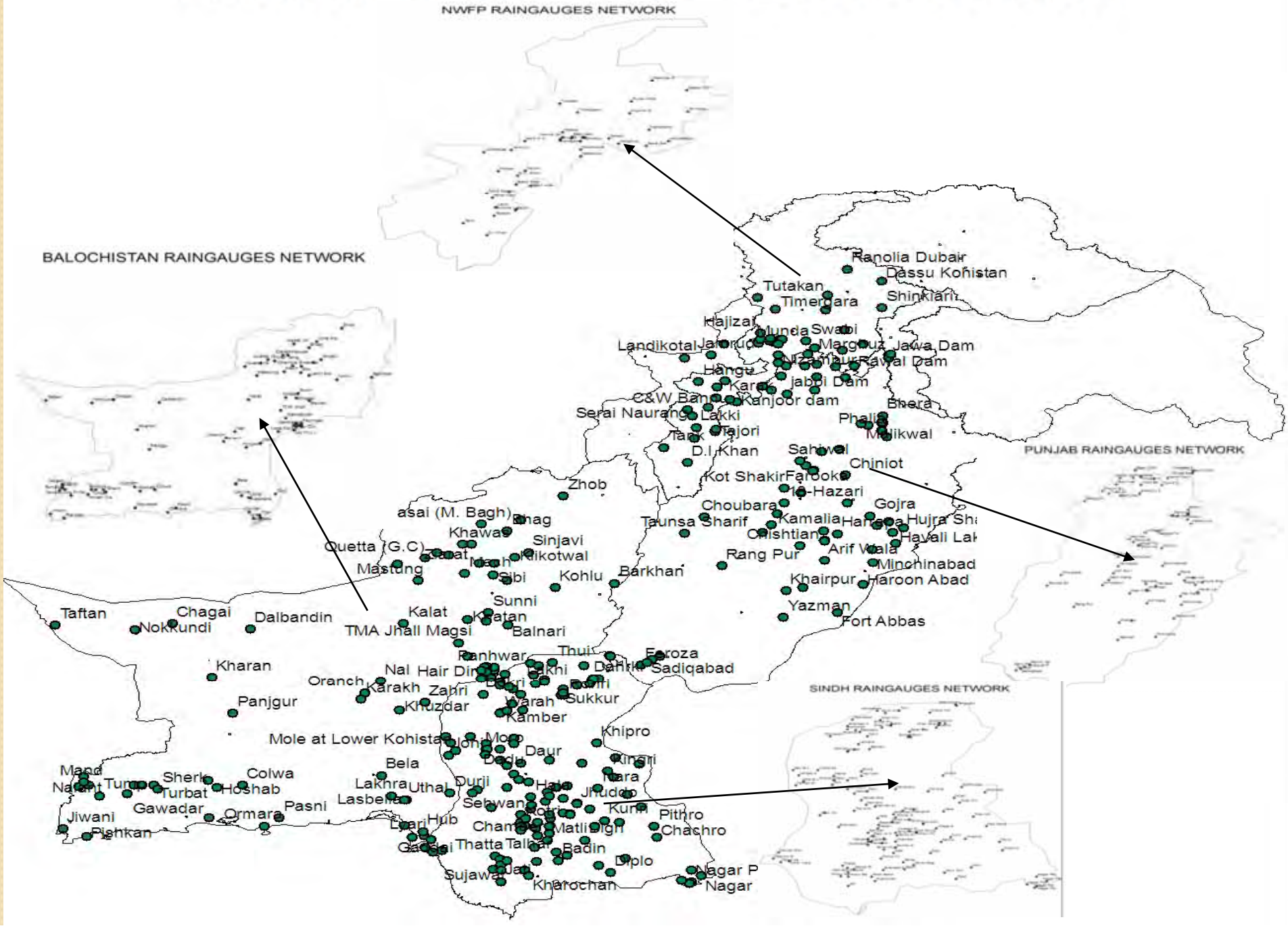
Additional data generation Resources in this project

- **AWS Network in the country 45**
- **Rain-guage stations 500**

Automation of Meteorological Observing Network



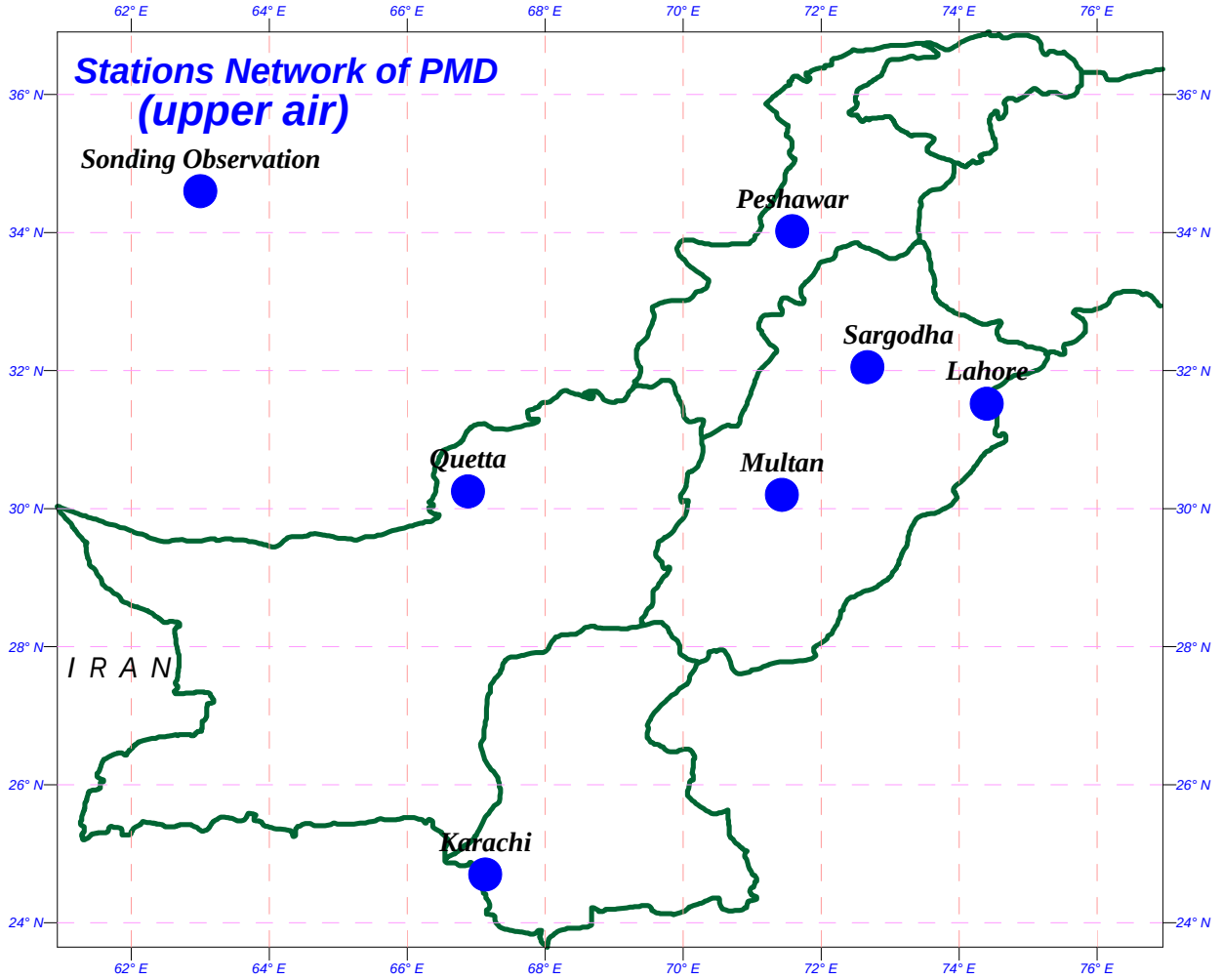
PAKISTAN RAINGAUGES NETWORK



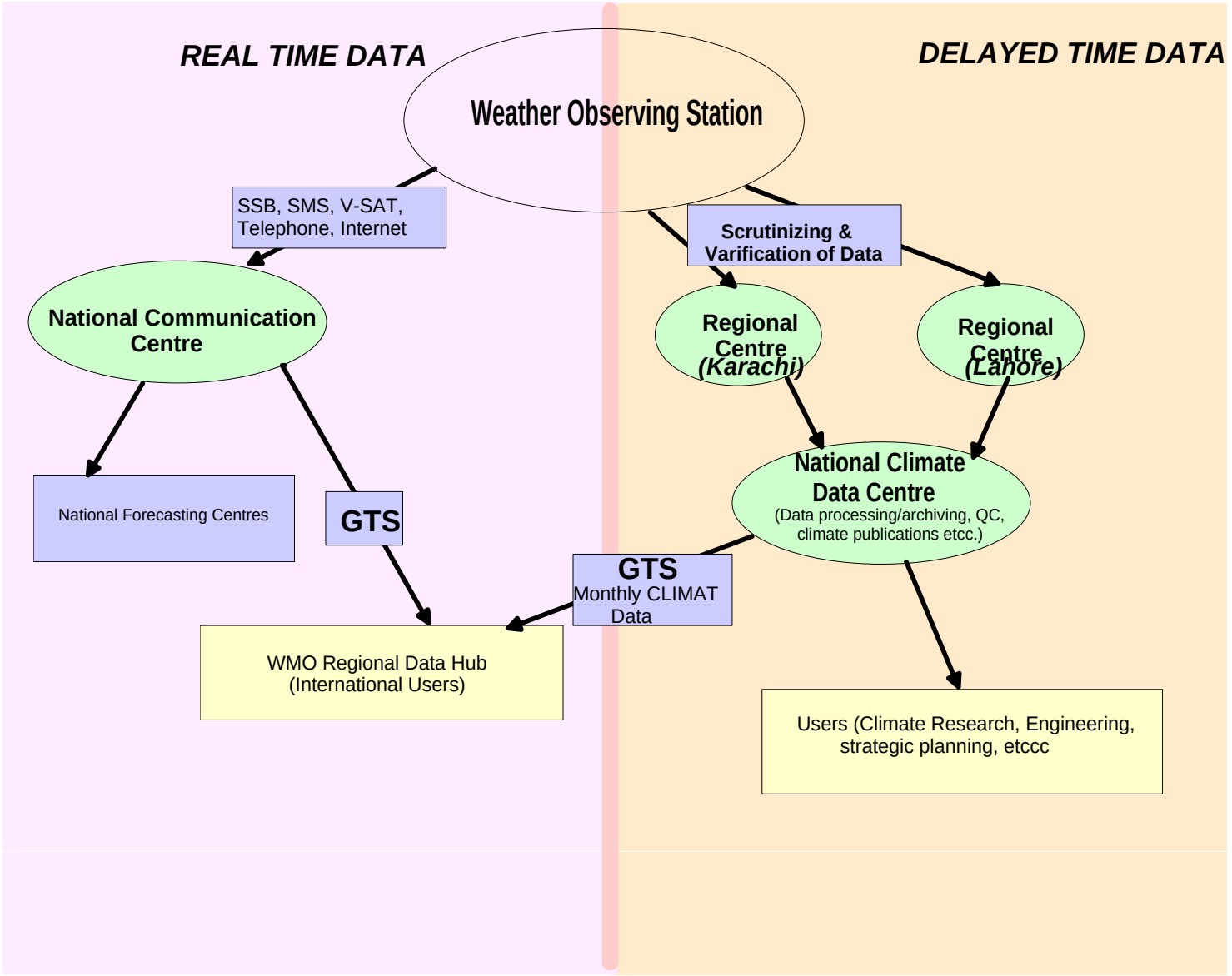
UPPER AIR
RBSN, RBCN, GUAN, manned stations and automated system stations

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

UPPER AIR
RBSN, RBCN, GUAN, manned stations and automated system stations



Data flow to users and archives



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

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) Via 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.

Statistics and applications

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

- 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.

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).


THANK YOU