

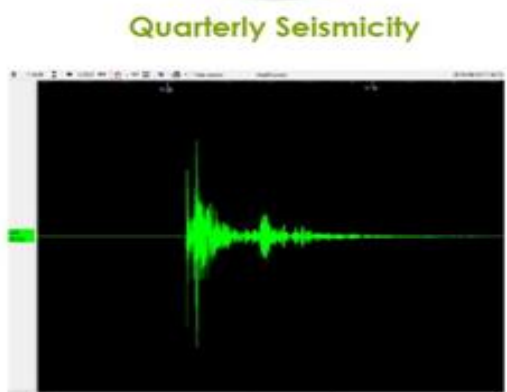
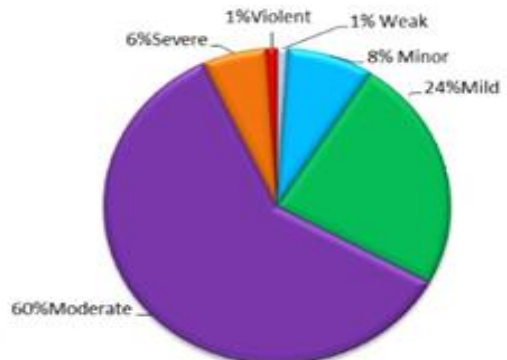
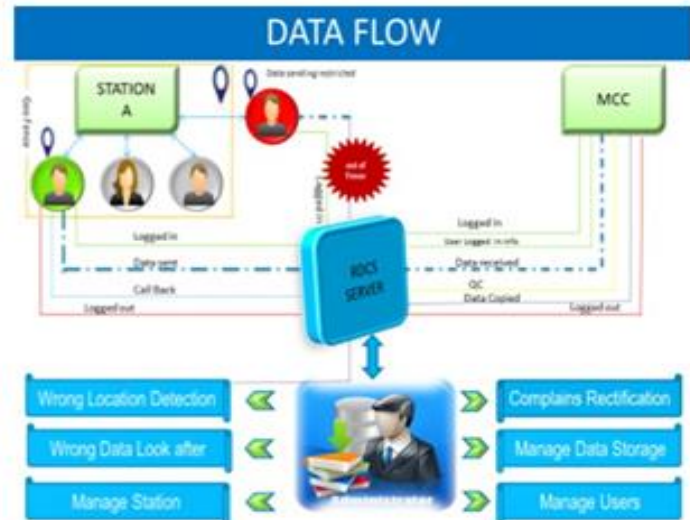


# RMC LAHORE TIMES

## Pakistan Meteorological Department

### HIGHLIGHTS

- Data sharing with Punjab Agriculture Department and Quaid-e-Azam Solar Park through RDCS.
- RDCS's User Profile system.
- Highest Max. Temp 47.0°C at Bhakkar on 04-07-2019.
- Lowest Min. Temp 12.0°C at Rawalakot on 21-09-2019.
- Highest Rainfall 180.9mm at Sialkot A/P on 28-07-2019
- Highest Windspeed 65 knots at Lahore A/P on 04-07-2019.
- Total 40 local Seismic events recorded at Lahore Station.



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5.8Mw 5KM North of Jhelum, Pakistan

## Preface

The basic objective of this publication is to highlight the quarterly activities carried out at Regional Meteorological Centre (RMC) Lahore. RMC is part of Pakistan Meteorological Department (PMD) headed by the Director, responsible for administrative, financial and technical control of all units of PMD in Punjab and Azad Jammu & Kashmir region. The region is very important and vulnerable for all-natural disasters due to its geographical & geological features. The socio-economic activities in this region are heavily depended on meteorological parameters. All the meteorological parameters which are recorded at different units of PMD are then computerized at Regional Climate Data Processing Section at RMC after quality checks for the public, researchers, developers, economists, government and private agencies for the development, land reforms, agricultural sector, urban planning and all fields of life.

In meteorology, the human skill development is very important for accurate weather parameter reporting. This can be achieved by developing a healthy, hygienic and up to date environment to all staff at all units which has been insured at all units.

I acknowledge the efforts of all the officers & officials at respective stations and units for their contribution to maintain the observation up to the mark of World Meteorological Organization (WMO) standards. It is the result of this same spirit that our officials have come up with a new innovation in the techniques for the better data processing and handling. Hence, upgrading the system for a bright and better future of Pakistan in the field of meteorology.

**Muhammad Ajmal Shad**  
**Director**  
**RMC Lahore**  
**042-99205591**

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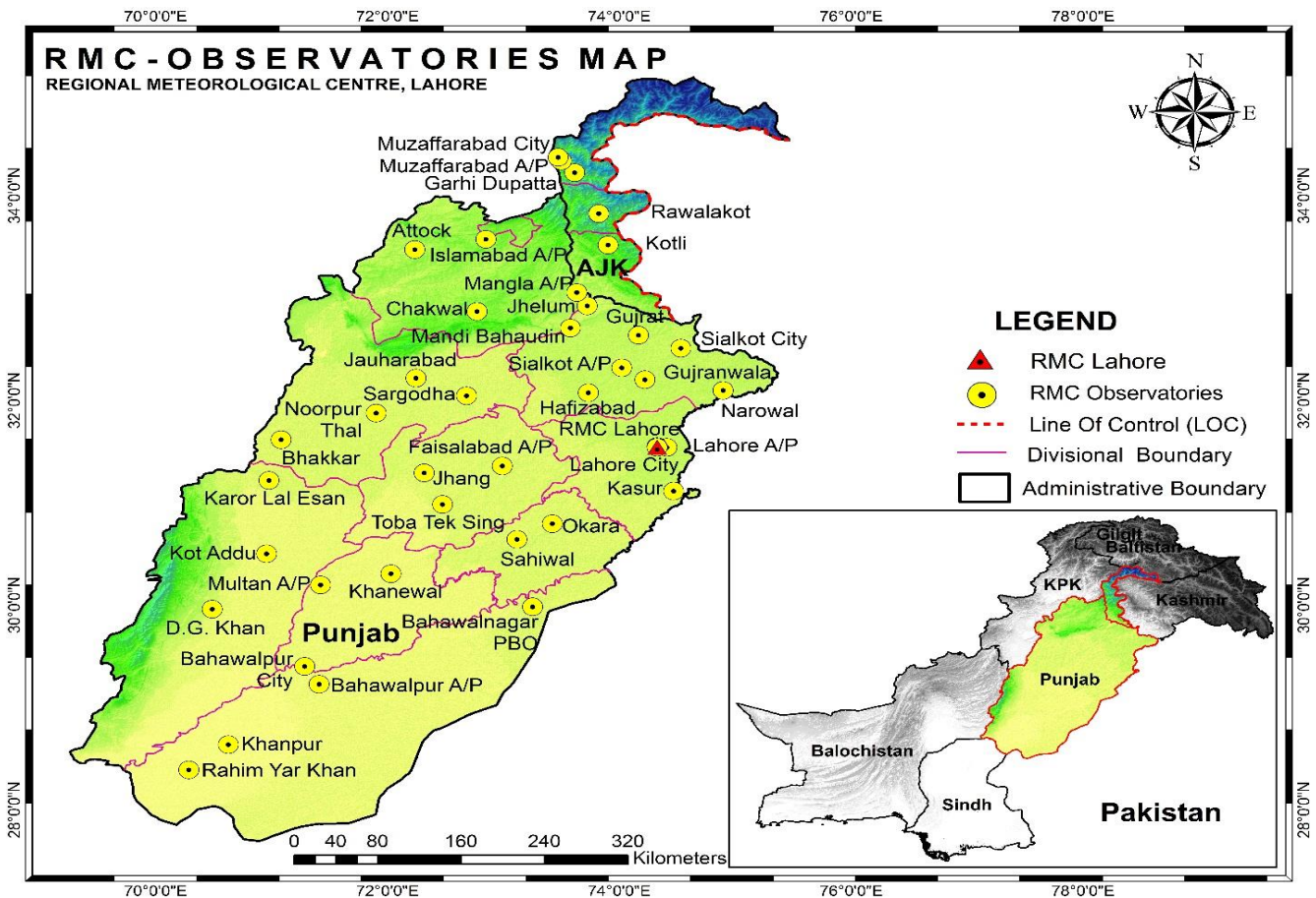
## Summary

During the quarter July-September, 2019 working environment has been improved at six Met. Observatories under RMC (Regional Meteorological Centre) while repair/reconstruction work proposed at RMC along with five other observatories. During this tenure fourteen officials joined on Transfer/Cancellation of LPR/Attachment in this office and Met Observatories, eight Officials departure on transferred and four employees retired from Govt service.

Seismic Monitoring Centre Lahore has recorded 275 global and 40 local Earthquake events. Most destructive event was 5.8 magnitude originated at 05 km North of Jhelum.

Regional Climate Data Processing Center Lahore analysis based on meteorological data shows highest maximum temperature 47.0°C at Bhakkar, lowest minimum temperature 12.0°C at Rawalakot, highest rainfall 180.9mm at Sialkot Airport and highest wind speed 65 knots at Lahore A/P.

IT Section has developed a new feature UPS (User Profile System) in RDCS and APIs to share data with Punjab Agriculture Department, Quaid-e-Azam Solar Power (Pvt.) and Civil Aviation Authority



## About RMC Lahore



REGIONAL METEOROLOGICAL CENTRE (RMC), Lahore is the regional head office of the Pakistan Meteorological Department (PMD) for Punjab and Kashmir. RMC Lahore started its function as a Meteorological Observatory in 1885 and has been functioning since then. It is one of the oldest observatories in Indo-Pak sub-continent. The Meteorological Observatory was then upgraded into Regional Meteorological Centre in 1956 and shifted in a newly constructed building. Mr. Abdul Hayee was the first Director of RMC, Lahore. Then in 1958, Seismic Observatory was also established in the building of RMC, Lahore. Initially RMC, Lahore was controlling all the Meteorological Observational stations located at various places of Punjab, Kashmir, KPK and Gilgit-Baltistan.

Now, Regional Meteorological Center (RMC), Lahore, under the supervision of Director controlling all the Surface observatories Met. Offices (MOs), PBO Stations, Agro met stations, AWS Stations and Seismic stations of Punjab and Kashmir.

## Observatories Overview

### 1. PBO Khanpur

PBO Khanpur lies on 28.39N and 70.41E with elevation 88.4m having index No 41718 is the oldest observatory functioning under RMC established in 1926.



### 2. MET Observatory, Bahawalpur City

Met observatory Bahawalpur City lies on 29.20N and 70.47E with elevation 110m having index No 41700 is the second oldest observatory functioning under RMC established in 1975.



## Improved Working Environment at Met Observatories

Six Met Observatories repair/ installation work has been carried out during this quarter. Accordingly, the requisite work was carried on the following stations, keeping in view the budget provision.

Sr.No	Station Name	Brief Description of Work
01	Mian Muhammad Nawaz Sharif University, Multan	Installation of evaporation tank at Mian Muhammad Nawaz Sharif University.
02	Met Observatory, KotAddu	Installation of Barometer.
03	PBO, Okara	Paint the Enclosure and cleaned the whole observatory.
04	Met Observatory, Narowal	Paint the Enclosure.
05	Met Observatory, Kasur	Paint the Enclosure.
06	Met Observatory, Attock	Whitewash of whole Observatory and provision of tables, curtains and ceiling fans for Observatory.

## Details of Repair/Reconstruction Work Required at RMC Lahore and Met Observatories under RMC

Sr. No	Station Name	Required work
01	RMC Lahore	Approval of construction of 08 Cat-v, family lodges and hostel accommodation has been accorded in 2008 and PC-1 has also been submitted but the construction work has not been started so far due to non-availability of fund. There is a need for allocation/release of fund for the said work.

02	Met Observatory, MandiBahauddin	Repair work of In-charge room, observational room and white wash of building, paint of Met. Instruments as well as enclosure, shifting of main gate.
03	Met Observatory, Bahawalpur City	White wash of building and minor repair of building as required in hostel.
04	Met Observatory, Layyah	Provision of furniture (table (5*3) and 04 ordinary chairs.
05	Met Observatory, Sahiwal	Minor repair and white wash of whole building.
06	Met Observatory, Kot Addu	provision of electric motor and Steel Almirah

The condition of infrastructure is very poor and requires major investment for construction. Coordinated and progressive efforts are requested that would help contribute in projecting positive image of PMD.

## RMC Activities

1. Director RMC visited D.G Khan Airport for QMS, competency test of AMO.
2. Director RMC attended a meeting held in the office of Xen Irrigation Department D.G Khan for the provision of NOC for the establishment of observatory at Rajanpur (Irrigation Department).
3. Director RMC attended CCRI meeting to aware farmers regarding weather conditions.
4. Zahid Hussain, Chief Inspector (Met.) visited M.O. Lahore on 19-09-2019 for Calibration of Met. Instruments.



## Transfer/Joining Within Region

1. Khalid Ijaz, Sr. Observer joined on 11-09-2019 on a/c of his transfer from RMC, Lahore to Met. Obsy, Okara.
2. Imran Afzal, Sr. Observer joined on 02-09-2019 on a/c of his transfer from Met. Obsy, Okara to RMC, Lahore.
3. Shafiq-ur-Rehman, Sr. Observer joined on 05-09-2019 on a/c of his transfer from M.O. Multan to Met. Obsy, Bahawalpur.
4. Mudassar Saeed, Radio Mechanic joined on 23-09-2019 on a/c of his transfer from Met. Obsy, Bahawalpur to RMC, Lahore.

## Joinings on Transfer

1. Muhammad Shoukat, Assistant Programmer joined on 18-07-2019 on a/c of his transfer from IMG, Karachi to RMC, Lahore.
2. Tahir Malik, Sr. Observer joined on 17-07-2019 on a/c of his transfer from Mirpur Khas to Met. Obsy, Bahawalpur.
3. Muhammad Nadeem, Sr. Observer joined on 24-06-2019 on a/c of his transfer from WSR, R.Y. Khan to Met. Obsy, KotAddu.
4. Muhammad Arshad, Mechanic G-I joined on 29-07-2019 on a/c of his transfer from Workshop, Karachi to RMC, Lahore.
5. Mr. Ehsan-ul- Haq, CDEO joined on 02-08-2019 on a/c of his transfer from NMCC, Karachi to RMC, Lahore.
6. Mr. Shahid Mahmood, Sr. Observer joined on 26-08-2019 on a/c of his transfer from Met. Obsy, Lasbella to PBO, Khanpur.
7. Asim Nawaz, Met. Assistant joined on 13-09-2019 on a/c of his transfer from CDPC, Karachi to Met. Obsy, Attock.
8. Muhammad Shamraiz, N.Q joined on 04-09-2019 on a/c of his transfer from Met. HQ. to PBO, Muzaffarabad.

## Departures on Transfer

1. Mumtaz Ali, Sr. Observer departed on 20-07-19 on a/c of his transfer to Met. HQ. Islamabad from Aeromet, Mangla.
2. Muhammad Arif, Sr. Observer departure on 24-07-2019 on a/c of his transfer to Met. HQ. Islamabad from Met. Obsy, Attock.
3. Mr. Gul Akhtar Zubairi, Sr. Observer departure on 16-08-19 on a/c of his transfer to Met. Obsy, Kakul from Aeromet, Muzaffarabad.

## Joining on Cancellation of LPR

1. Mr. Rashid Eijaz, Sr. Observer joined on 23-09-19 at PBO, Bahawalnagar after withdrawal of LPR.

## Joining on Attachment

1. Mr. Muhammad Shafiq, CDEO joined on 18-08-19 on a/c of his attachment at M.O. Faisalabad transferred from NWFC, Islamabad.

## Encashment

1. Muhammad Riaz and SohailInayat, Balloon Makers have been granted 365 days encashment with effect from 01-08-2019.

## Retirements

1. Muhammad Arshad, Sr. Meteorologist, M.O. Sialkot retired from Govt. Service w.e.f 02-07-2019 at the age of superannuation.
2. Mr. Abdul Razzaq, Sr. Observer, Met. Obsy, Garhi Dupatta retired from Govt. Service w.e.f 01-08-2019.
3. Ghulam Rasool, Met. Assistant, M.O. Multan retired from Govt. Service on 30-09-2019.
4. Tahir Suleman, Balloon Maker, PBO, Jhelum retired from Govt. Service 30-10-2019.

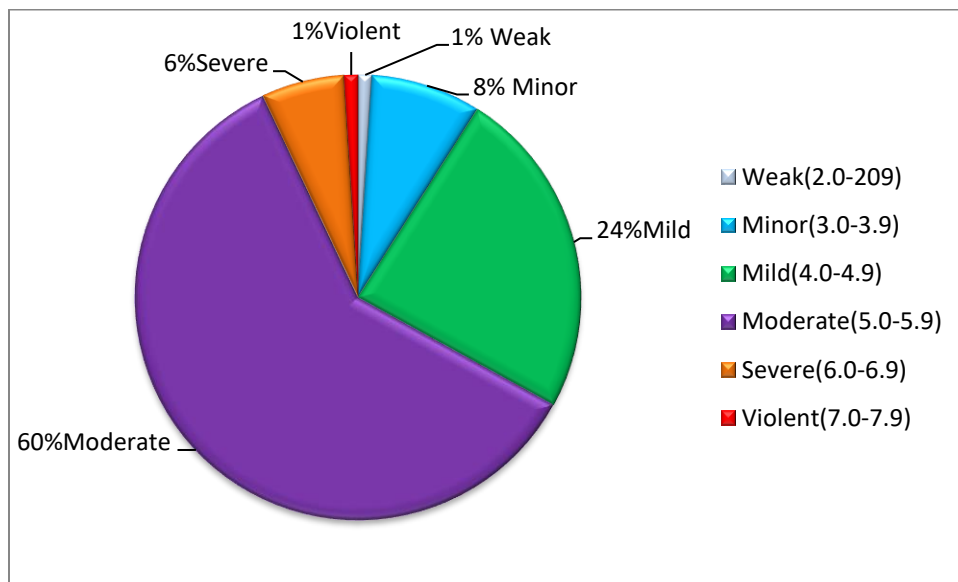
## Seismic Activity

### Particulars of Station

Sr. No.	Station	Symbol	Latitude °N	Longitude °E	Height (a.s.l.) in meters	Equipment Installed	Remarks
01.	LAHORE	LHR	31.5500	74.3300	210	D.S.E	Short Period

The Seismic Monitoring Centre Lahore is working round the clock to record and monitor seismic activities all over the world, especially Pakistan, South-Asia and neighboring countries.

During the months from July to September 2019, total numbers of events recorded by Sensor at Seismic Monitoring Centre Lahore are 315. The frequency analysis based on magnitude of events depicts that 1% events in Weak (2.0-2.9) 8% events are in Minor (3.0-3.9), 24% events are of mild magnitude (4.0-4.9) range 60% events of moderate magnitude (5.0-5.9) and 6% events of severe magnitude (6.0-6.9). 1% events of violent magnitude (7.0-7.9) are reported during July to September, 2019 as depicted in the Fig.01.

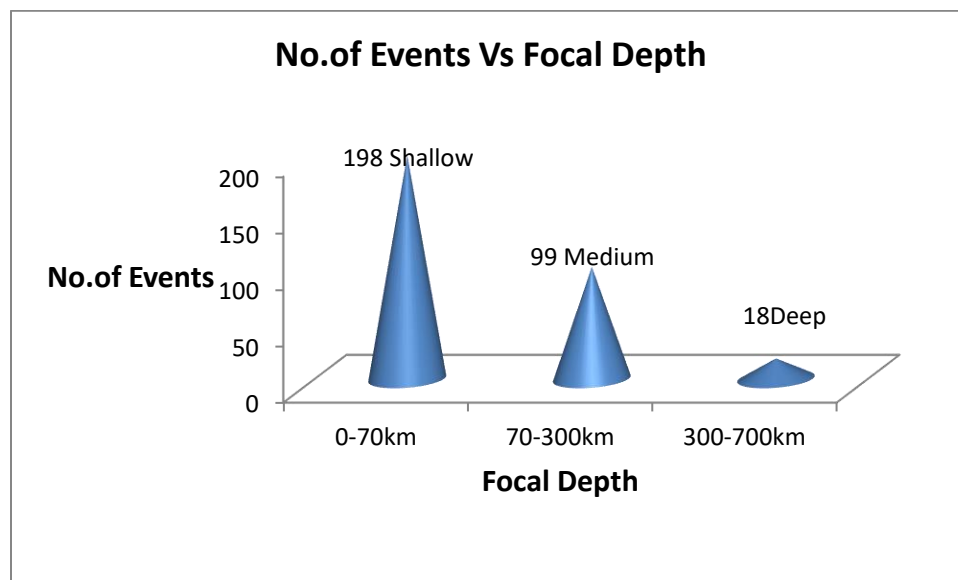


**Figure 01:** shows the number of events in %age recorded during July to September 2019 for different categories of severity in Magnitude range.

## Focal Depth

The frequency analysis based on focal depth of Seismic events during the months from July to September 2019 was carried out.

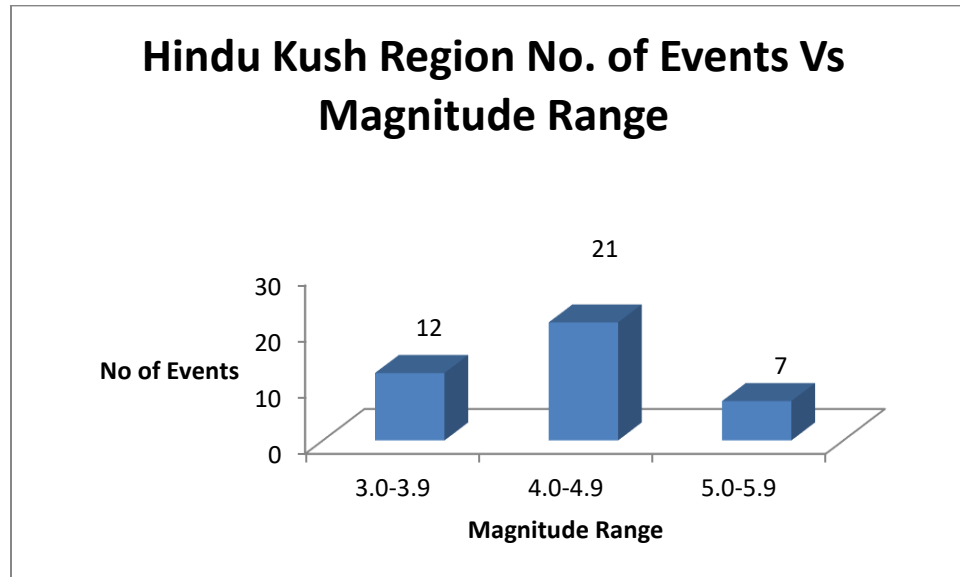
The analysis depicts that the frequency of Shallow focal depth (0-70 km) seismic events was maximum with 198 numbers. Shallow focal depth earthquakes are also known as crustal earthquakes. The Intermediate focal depth (70-300 km) seismic events were 99 numbers and 18 number of deep focal depth (300-700 km) seismic events recorded by PMD Seismic network at Lahore Seismic Station



**Figure 02:** shows the number of events vs. Focal Depth recorded during July to September, 2019 for different categories of severity.

## Seismicity of the Hindu Kush Himalaya Region

The Hindu Kush Himalaya region is the most vulnerable area for the Seismic activities due to continuous movement of Indian plate toward Eurasian plate resulting a movement of approximately 3mm/year which make it hazardous for seismic activities. Due to this major earthquake in the regions i.e. Pakistan, Afghanistan, Bangladesh, China, Nepal, India, Myanmar, Bhutan occurs periodically. The seismic activity during July to September 2019 has been plotted in the graph.



#### Most Destructive Event Felt During July to September 2019

**Date: 24-09-2019**

**Origin Time: 16:01:53 PST**

**Magnitude: 5.8**

**Depth: 10 km**

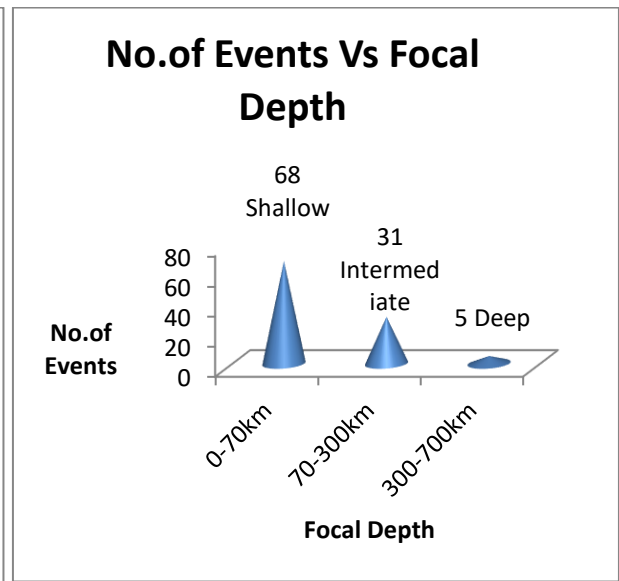
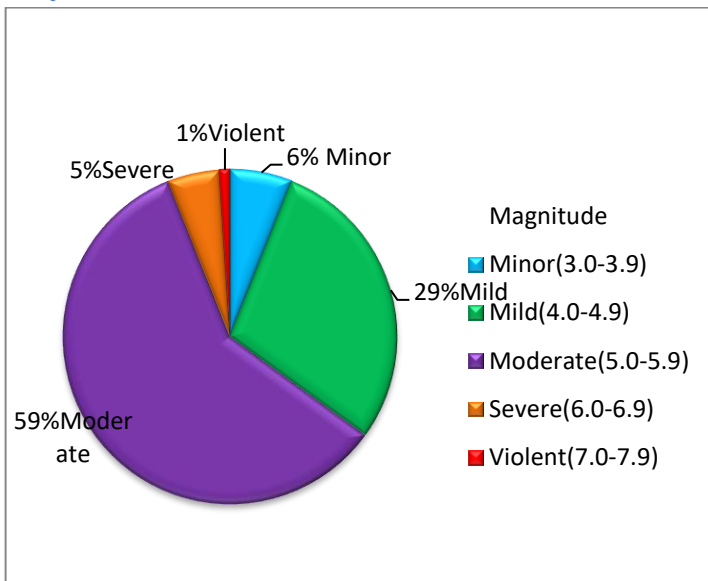
**Latitude: 32.99 N Longitudes: 73.73 E**

**Epicenter: 5 km North of Jhelum, Punjab, Pakistan.**

This earthquake was strongly felt in most parts of Upper Punjab (Jhelum, Mangla, Dina, Lahore, Kharian, Gujjar Khan, Gujrat, Hafizabad, Lala-Musa,) and AJK (Mirpur, Muzaffarabad). It was also felt at a number of places in KP, Islamabad and Punjab.

# Seismic Event Analysis

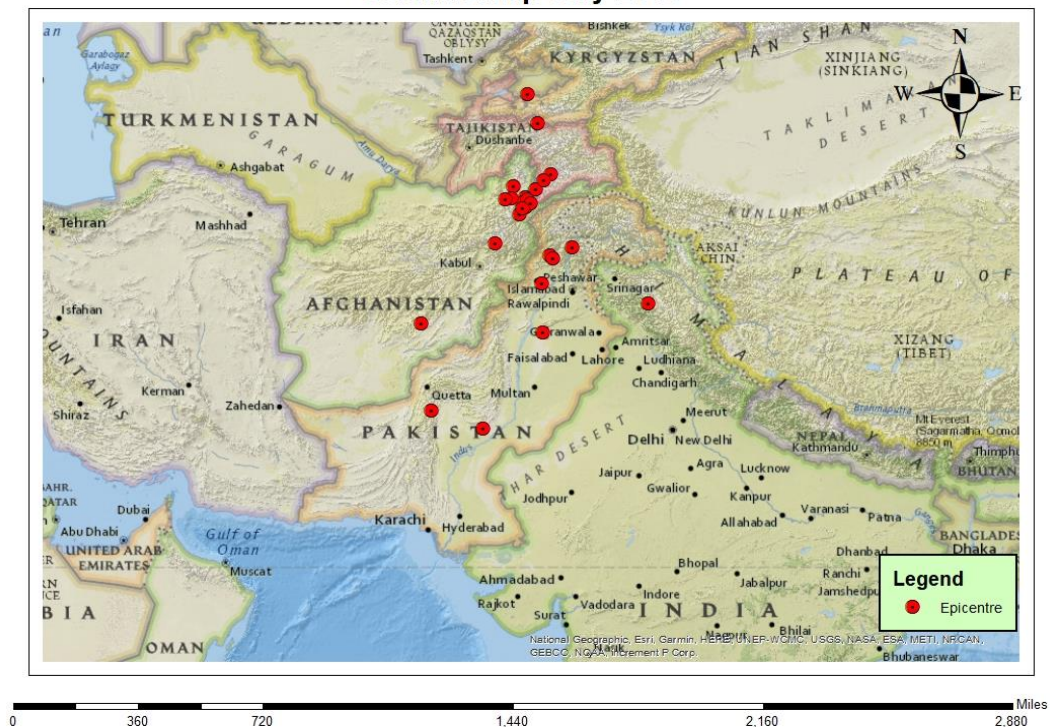
July-2019



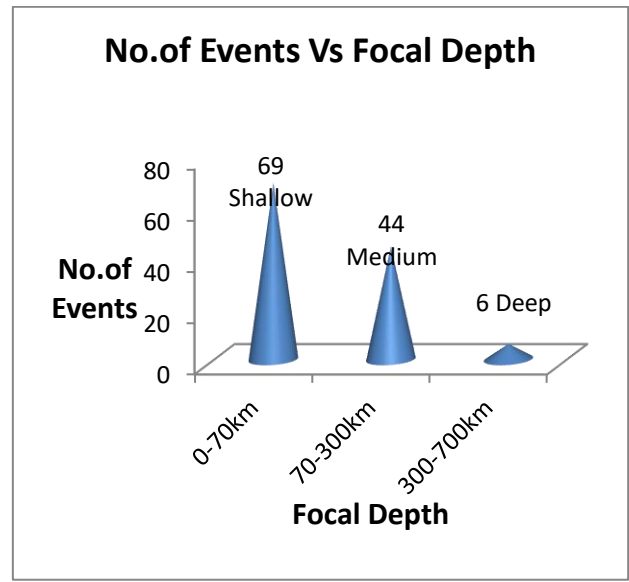
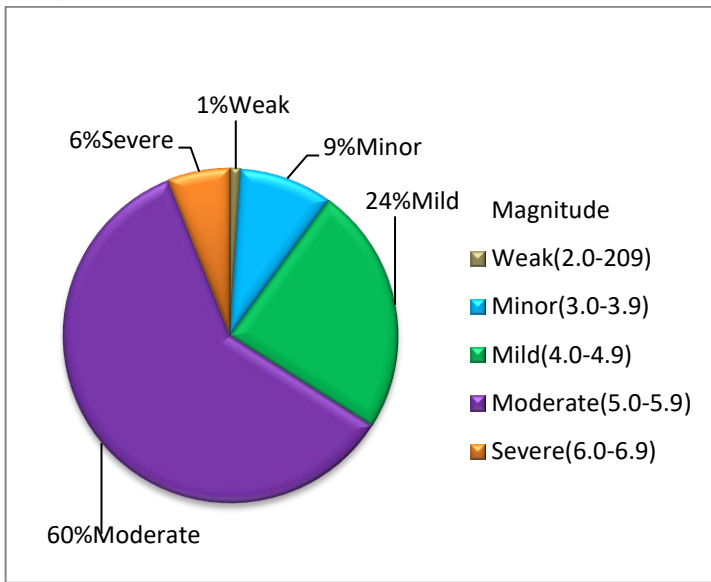
**Figure 1(i):** shows the number of events in %age recorded during the month of July, 2019 for different categories of severity.

**Figure 02(i):** shows the number of events Vs. Focal Depth recorded during the month of July, 2019 for different categories of severity.

## Seismic Map July 2019



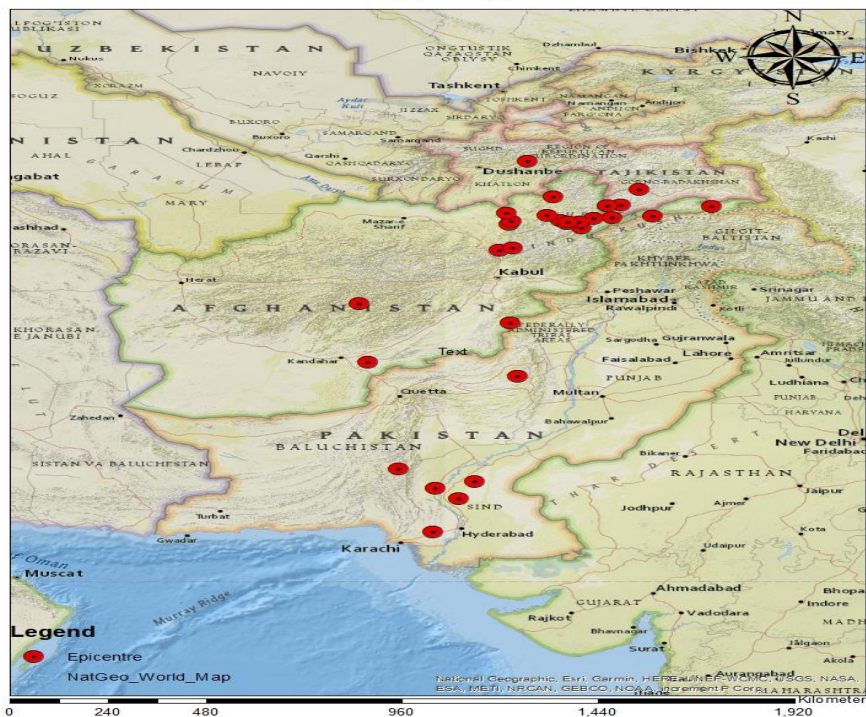
August-2019



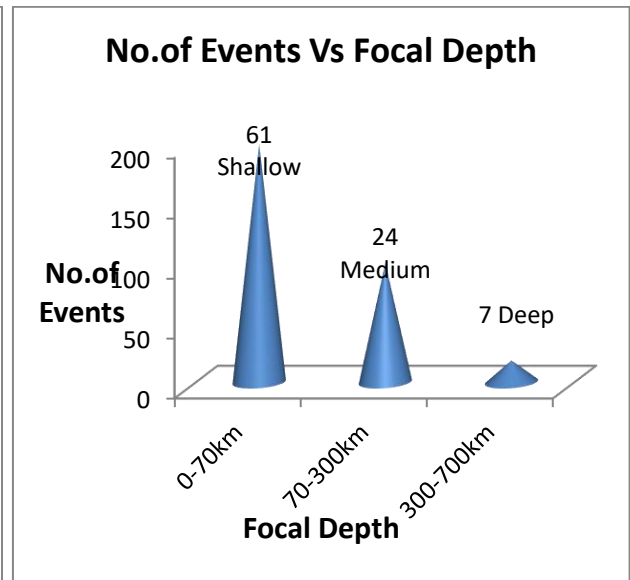
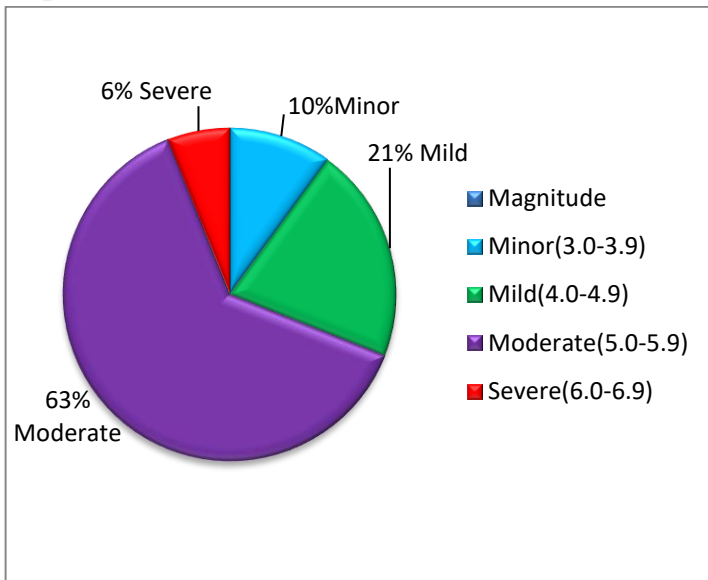
**Figure 1(ii):** shows the number of events in %age recorded during the month of August, 2019 for different categories of severity.

**Figure 02(ii):** shows the number of events Vs. Focal Depth recorded during the month of August, 2019 for different categories of severity.

Seismic Map August 2019



September-2019



**Figure 1(iii):** shows the number of events in %age recorded during the month of September, 2019 for different categories of severity.

**Figure 02(iii):** shows the number of events Vs. Focal Depth recorded during the month of September, 2019 for different categories of severity.

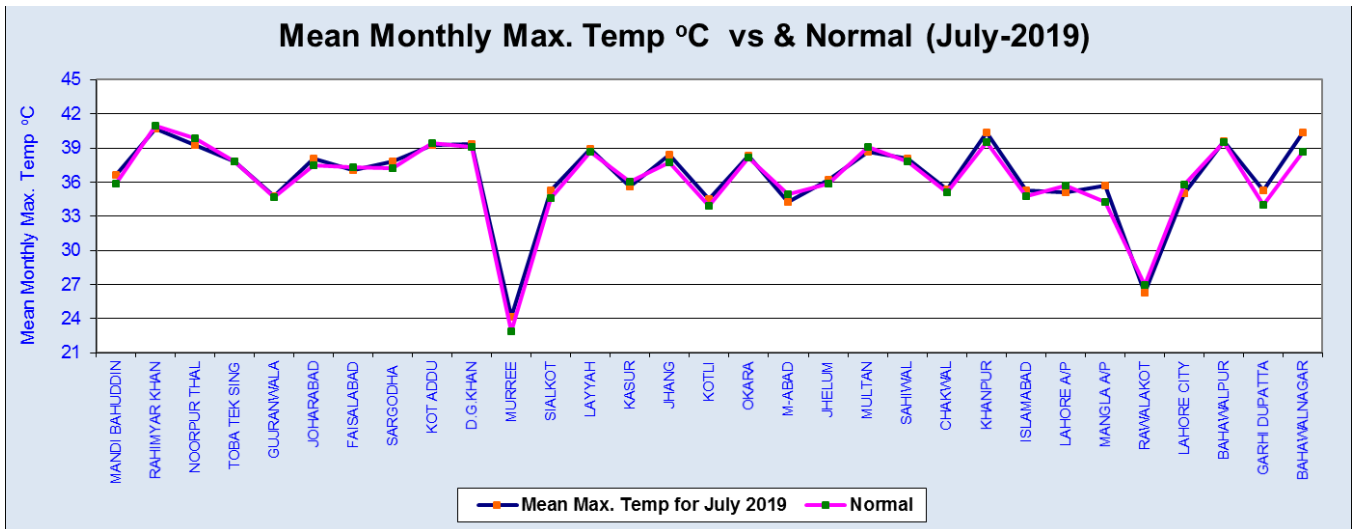
Seismic Map September 2019





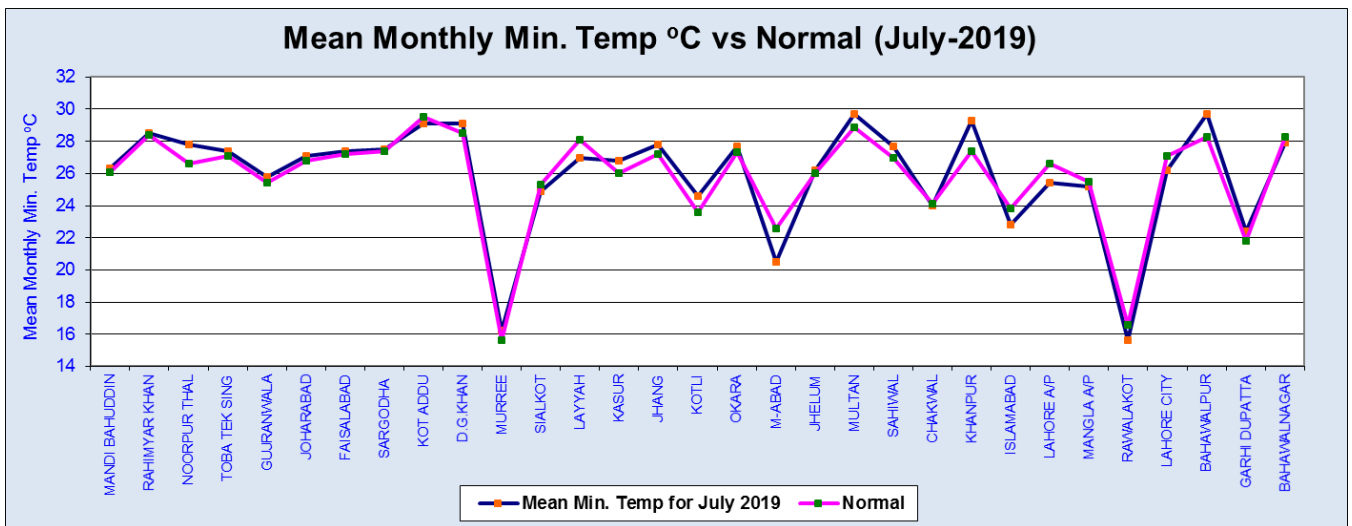
# Climatology of the Region

## Graphical Presentation of Met Data for July -2019



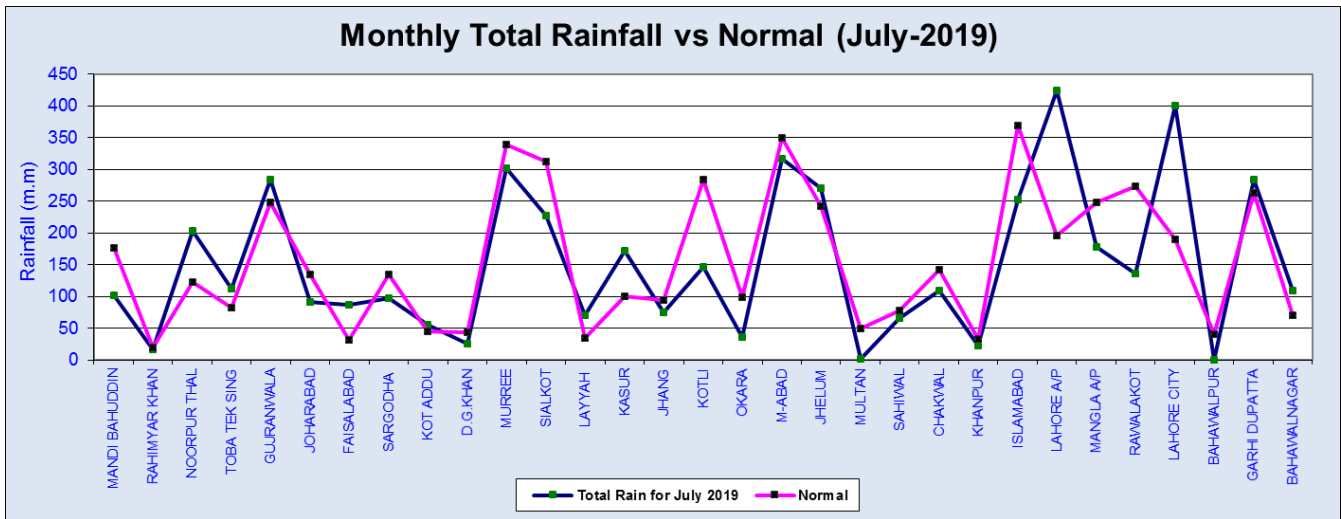
Mean Monthly Max. Temperature (°C) has been observed a little bit more (0.7%) than Normal.

- In Bahawalnagar 4.32% more average max temperature has been observed than Normal.
- In Murree 5.67% more average max temperature has been observed than Normal.



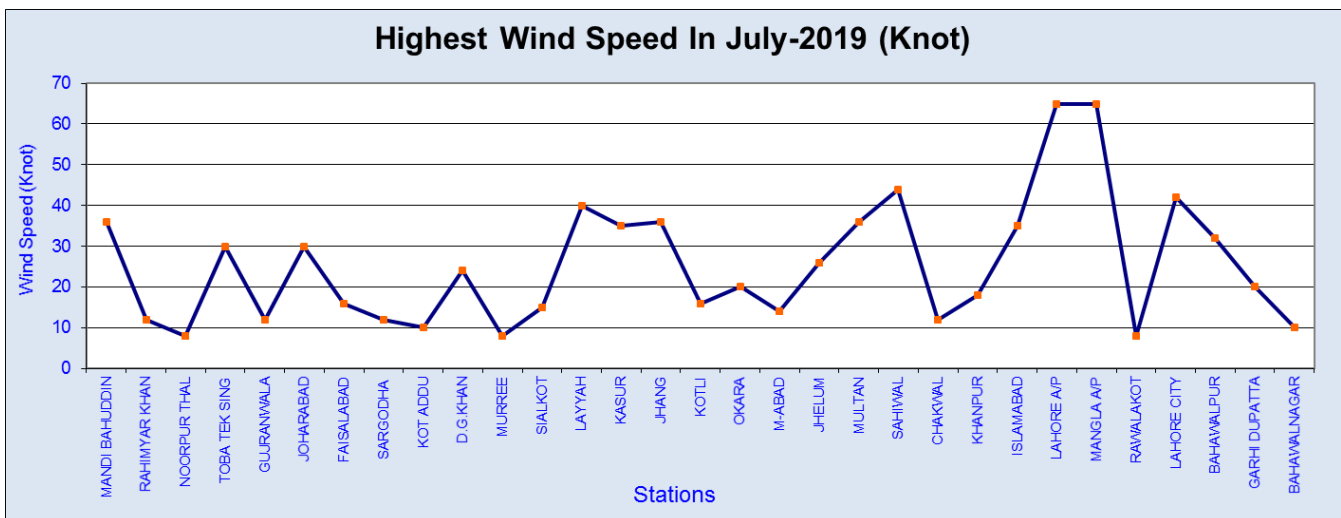
Mean Monthly Min. Temperature (°C) has been observed a little bit more (0.4%) than Normal.

- In Kanpur 6.93% more average min. temperature has been observed than Normal.
- In Muzaffarabad -9.29% less average min. temperature has been observed than Normal.



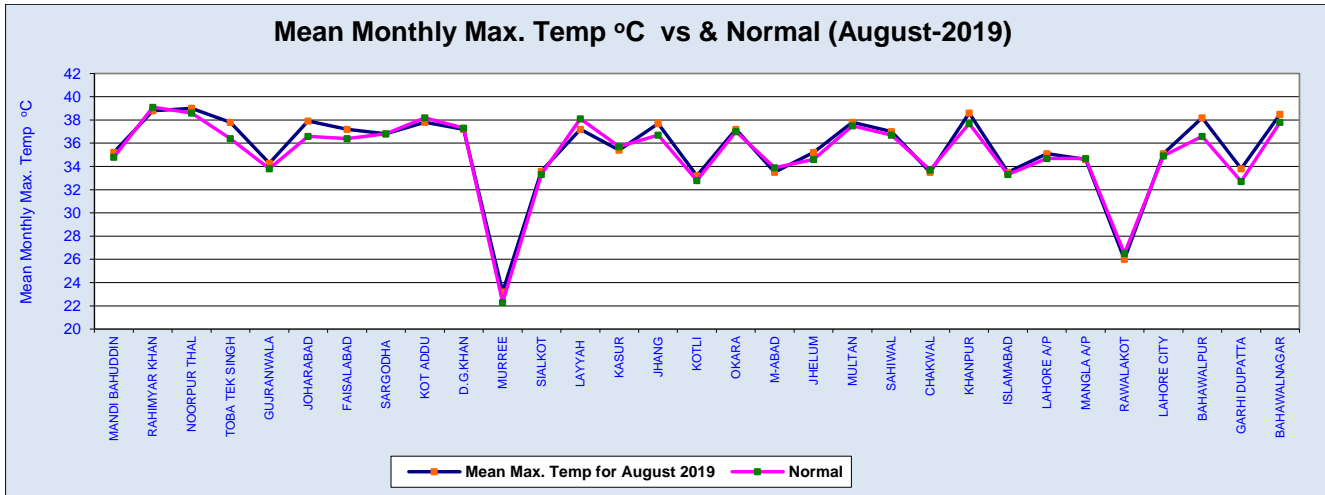
Comparison of Actual Precipitation (mm) during the month of July, 2019 with Normal values.

- -3.57% deviation of rainfall from normal has been observed overall in Punjab and A.J.K.
- 115.6% more than Normal in Lahore A/P and 110% more than Normal in Lahore City, rainfall has been observed
- -50% less than Normal in Rawalakot
- -48% less than Normal in Kotli, rainfall has been observed.

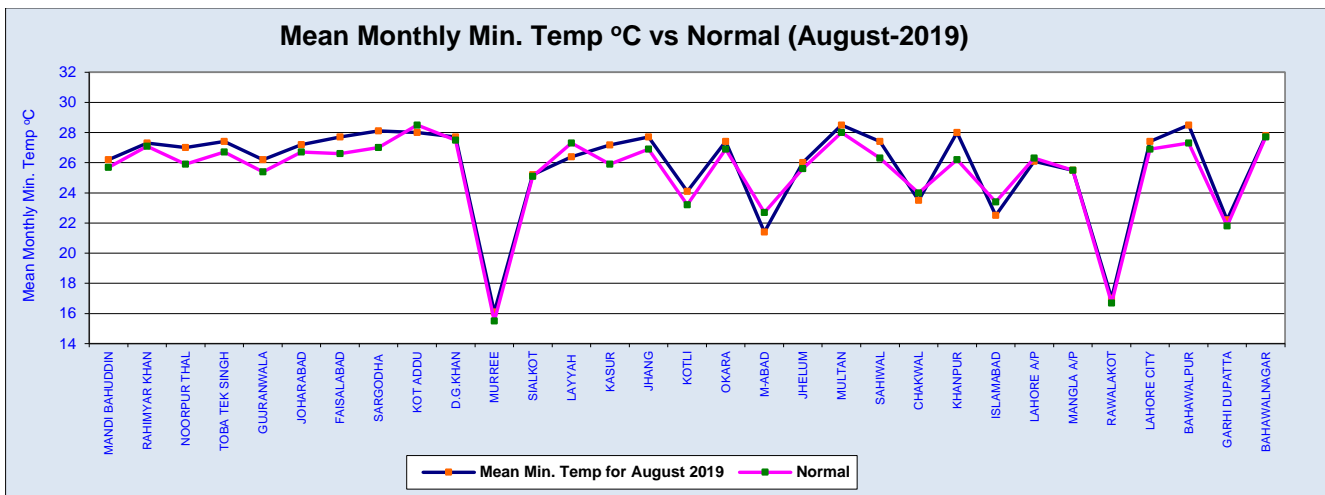


- Highest wind speed of 65 knots is observed at Lahore A/P and Mangla A/P.

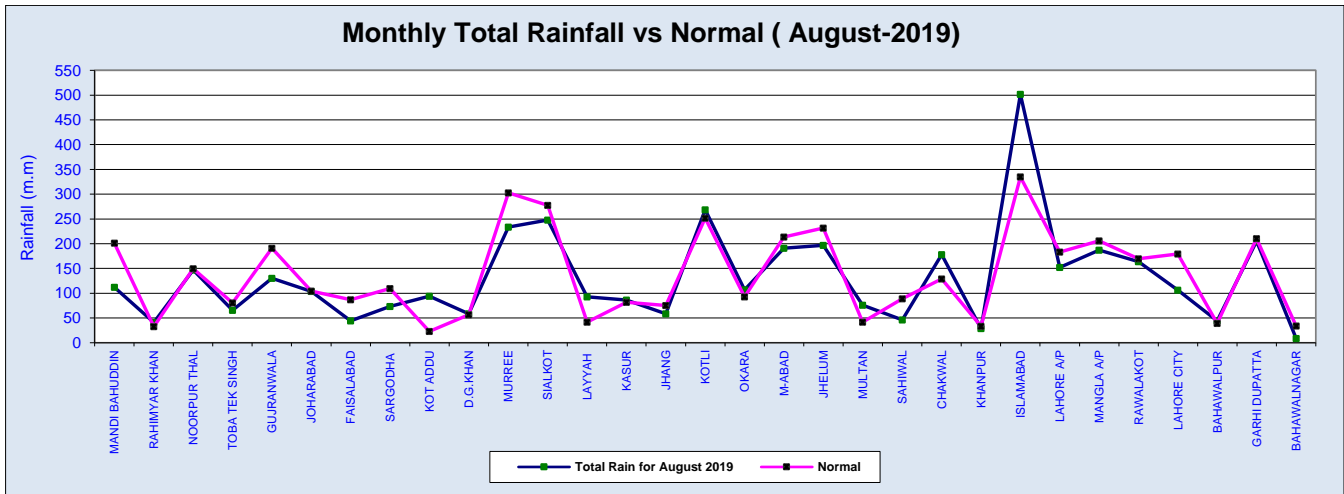
### Graphical Presentation of Met Data for August -2019



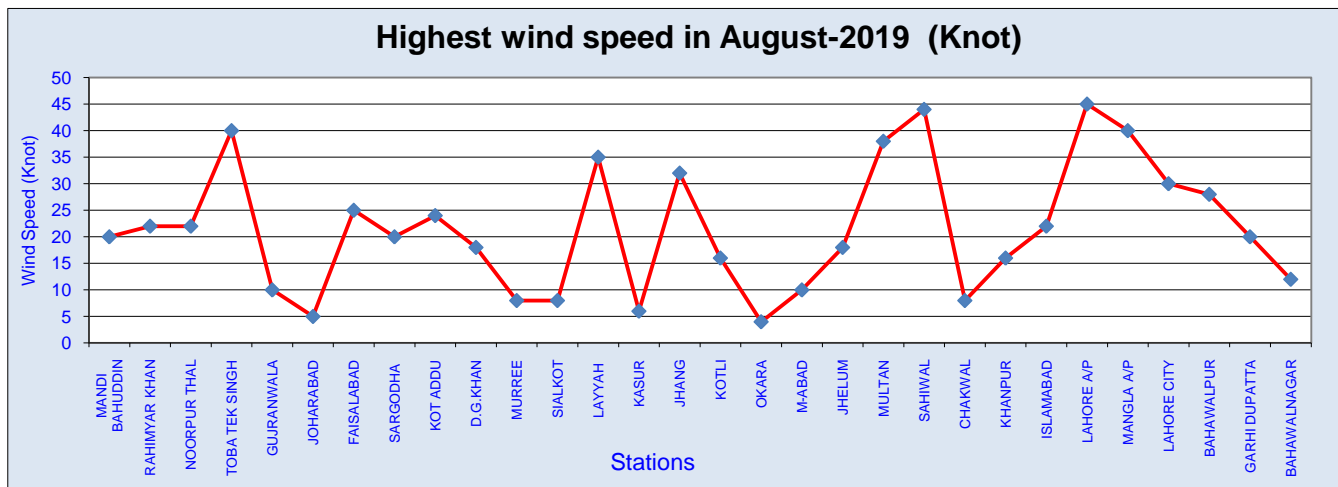
- Mean Max. Temp has been increased from Normal a little bit.
- Bahawalpur observatory recorded Mean Max. Temp +1.6 C° than Normal.



- Mean Min. Temp has been increased from Normal a little bit.
- PBO Khanpur recorded Mean Min. Temp +1.8 C° than Normal.



- -4.8 % to Normal rainfall has been recorded in Punjab.
- +166.8 to Normal rainfall have been recorded by Met. Office, Islamabad ZP.



- Max.Windspeed 45 knot was recorded by Lahore Airport.

## Regional Data Collection System (RDCS)

Regional Meteorological Centres are responsible to collect and manage Meteorological data of all observatories under their respective regions. There are five major types of Meteorological products that are being received at their respective time intervals.

1. Metar
2. Synop
3. Tafor
4. Pilot
5. Pocket Register

In the past, RMC's had adopted following communication mediums for data communication between Main Communication Center (A Section which is responsible to collect data from observatories and upload to website) and Observatories.

1. Tele printers
2. Radio communication (SSB)
3. Landline
4. Telephone

Currently observatories are sending data via SMS and following flaws are observed.

1. No User Information
2. No Location information and confirmation
3. User can send Bogus Data
4. No feedback for reception of Data
5. No Read Status

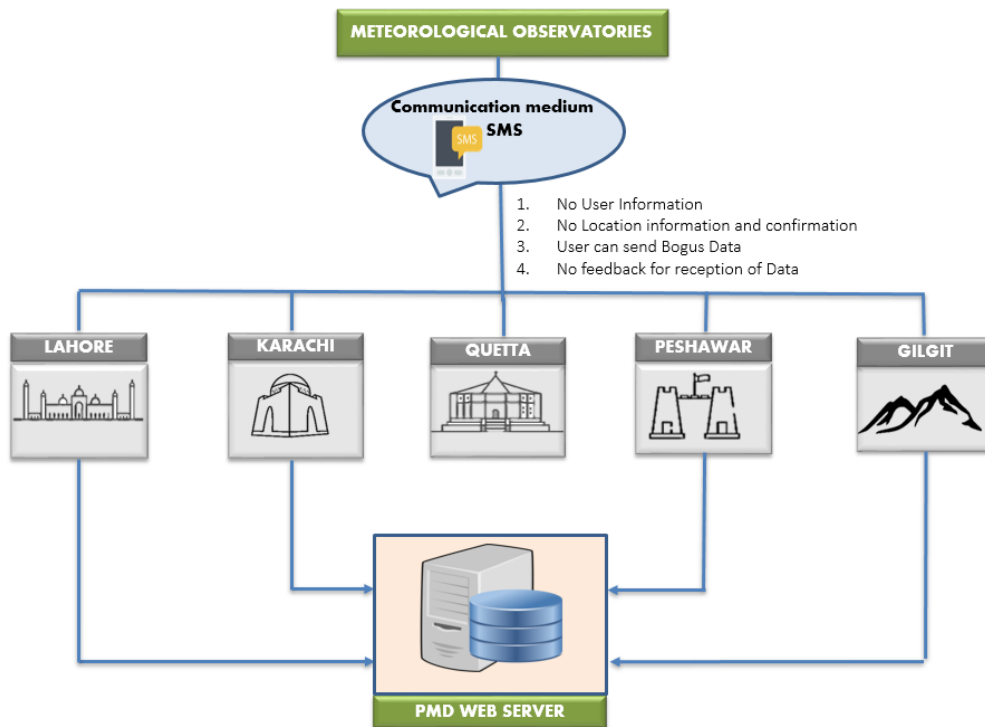
## Objectives

The upgradation of Communication System and Data Management is based on the following major objectives.

- **Centralize Database Management System**

The major objective is to develop a centralize Database Management system for all Regional Meteorological Centres to

- Manage Stations Information
- Manage Users Information
- Manage Meteorological data
- Log all Users Activities



- **Authenticate User Location**

The second objective is to authenticate the location of the user which is detected and verified by the RDCS server.

- **Quality Assurance and Quality Control**

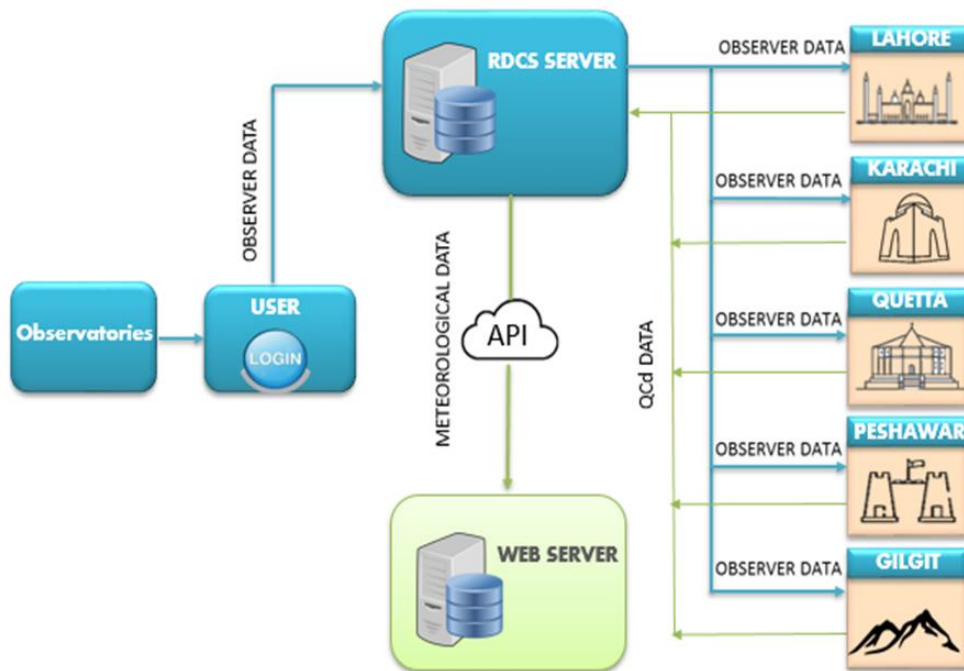
A centralized validation process to fix all inconsistencies and anomalies and Missing / Unknown entries in the data. After quality assurance RDCS will enable a centralized quality control process to improve Incompleteness, Accuracy, threshold values and group validation.

- **System Administrator**

System administrators are responsible to monitor overall operation, daily data management, upkeep and configuration of tablets (Android Devices) installed at observatories, troubleshooting, and planning for new installation.

- **Communication Device**

A communication device (Laptop/ Computer/ Tablet/ Mobile) is required for uploading data to server via internet. The best option is tablet, which includes a full-fledge computer system, low power consumption, screen size, portability, battery life with GPS sensor to get location of users.



Taking into consideration all the above drawbacks in communication systems, Regional Meteorological Centre Lahore has upgraded its communication system and developed web-based integrated system “Regional Data Collection System (RDACS) to collect and manage all types of Meteorological data Products.

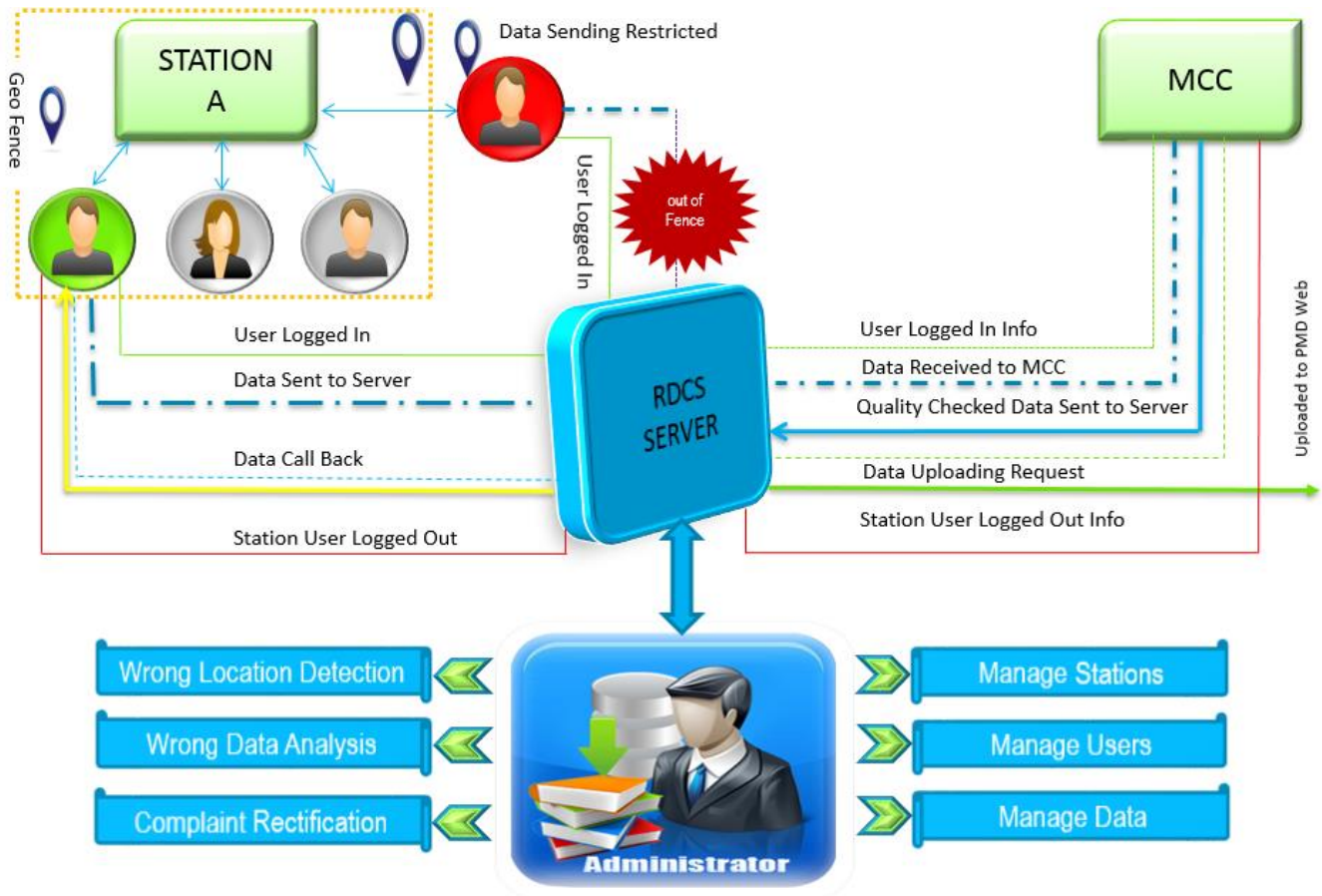
Regional Data Collection System (RDACS) is has following modules.

1. Geo Location
2. Stations Management System (SMS)
3. Users Management System (UMS)
4. Manage Stations Data
5. User Login/Logout Logs
6. MCC Portal
7. Observatory Users Portal

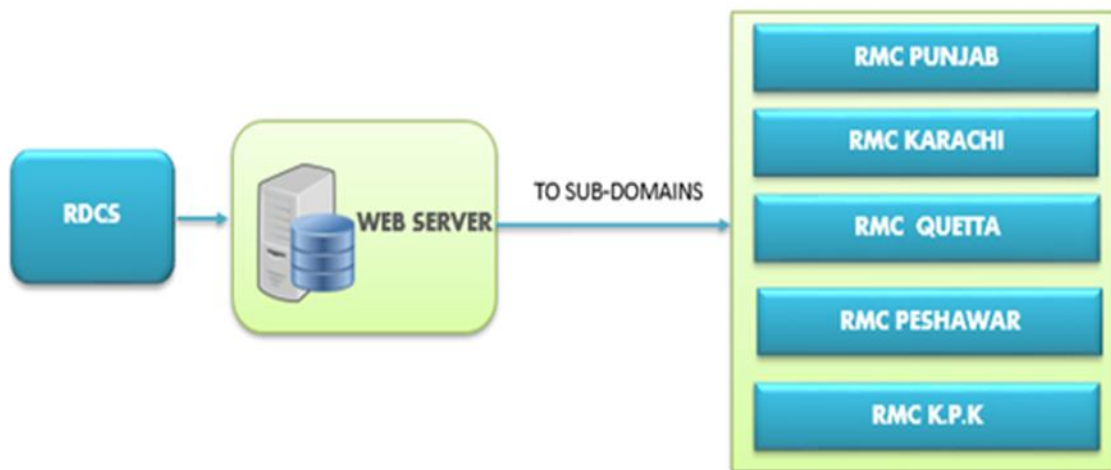
### Workflow

This software has three major user’s types. After authentication user will be redirected to its respective domains.

1. Once observatory user is logged-in, user will be able to send data to MCC after location authentication.
2. MCC users can perform quality assurance and quality control processes.
3. Admin User can manage stations, manage users, wrong location alerts, and meteorological data and generate report on the basis of analysis.



When all processes are completed then all sub-domains of Regional Meteorological Centres will get final data for public view.

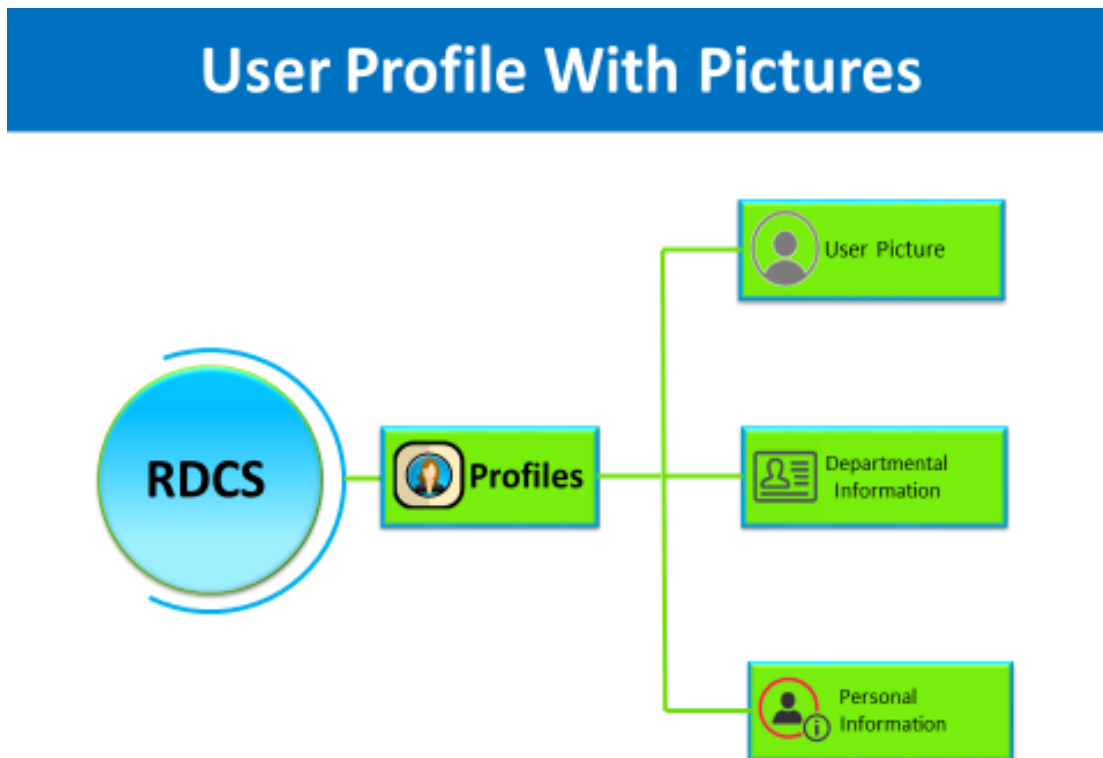




## Recent Development in RDCS

### User Profile System

Keep employee aware with his/her profile detail, this module has been developed to show the following information to connected users.



## Meteorological Data Sharing with Other Departments

### 1. Punjab Agriculture Department:

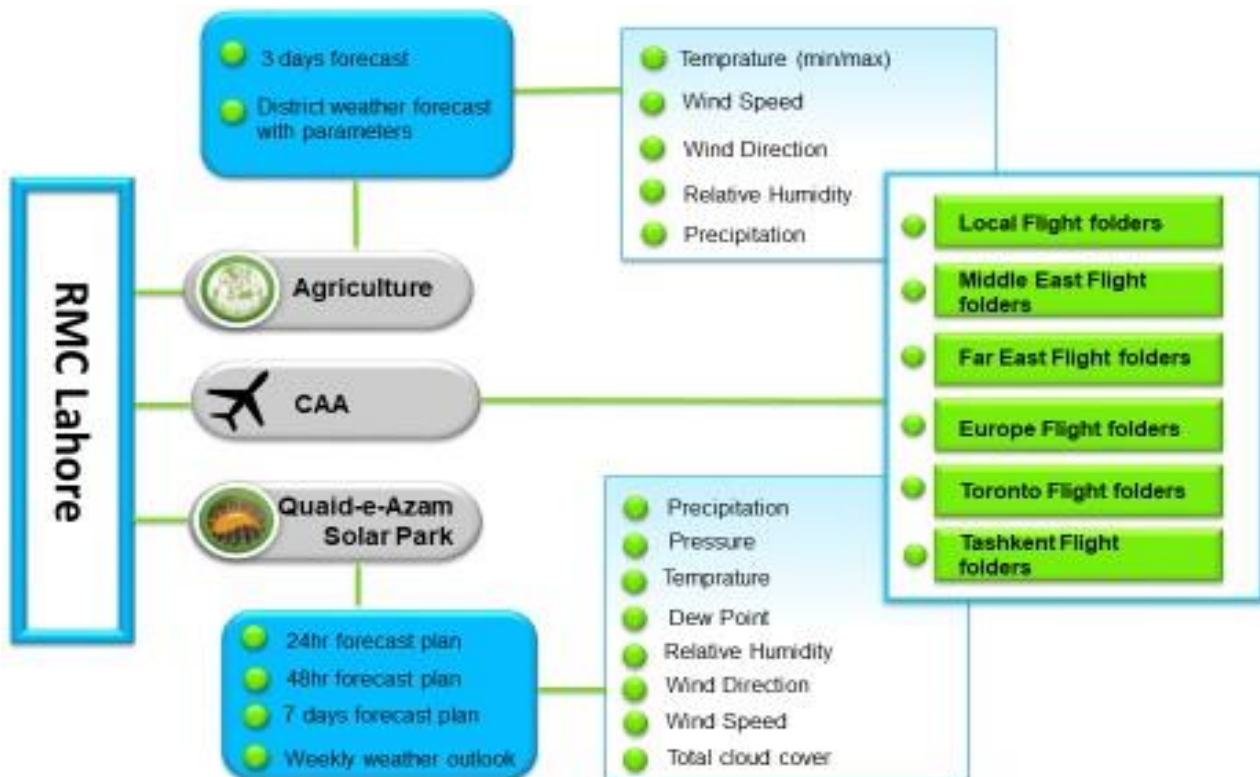
To enhance the agriculture production Punjab Agriculture Department and Pakistan Meteorological Department had signed MOU to share weather forecast with parameters all districts with farmers in Punjab.

2. Quaid-e-Azam Solar Power (Pvt.):

Quaid-e-Azam Solar Power (Pvt.) is a public-sector for-profit company to generate power from the renewable energy sources like solar power. Quaid-e-Azam Solar Power (Pvt.) requires weather forecast for next 10 days with parameters to forecast the power generation capacity. For this MOU has been signed between Regional Meteorological Centre and Quaid-e-Azam Solar Power (Pvt.).

3.Civi Aviation Authority:

Meteorological office (M.O) AIAP, Lahore under RMC Lahore was issuing flight folders manually. A new web-based application has been developed to issue flight folder to Civil Aviation authority and all other Government and Private Airlines.



## Gallery

### Farewell/Welcome party in Honors of Chief Met FFD



### Kashmir Solidarity Day

