

SECTOR A

APPENDIX

Result of Field Survey for FFWS

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APPENDIX: RESULT OF FIELD SURVEY FOR FFWS

TABLE OF CONTENTS

1. Existing Rain gauge stations.....	i
1.1 Islamabad (National Agromet Center, PMD).....	1
1.2 Saidpur	3
1.3 Rawalpindi Agromet Centre (RAMC)	5
1.4 Chaklala.....	7
2. Existing water level gauge station.....	7
2.1 Gawal Mandi Bridge	7
2.2 Ratta Amral Bridge.....	8
3. Existing warning post.....	9
3.1 Main Fire brigade warning post.....	9
3.2 Ratta Amral warning post.....	12
3.3 Gawalmandi warning post.....	13
3.4 Pirwadhi warning post.....	14
3.5 Waqar-un-Nisa College warning post	15
4. Proposed Rain gauge station site	16
4.1 Golra Area.....	16
4.2 Bokra Area	18
5. Proposed water level gauge station site	20
5.1 Kattarian Bridge	20

1. EXISTING RAIN GAUGE STATIONS

There are four existing rain gauge stations in Lai Nullah Basin, as described below.

1.1 Islamabad (National Agromet Center, PMD)

This rain gauge station is located at zero point in Islamabad and serves as the central station for the other three stations. Detailed information can be accessed through Internet from www.pakmet.com.

There are two types of rain gauge installed at this station. One is the automatic rain gauge and the other is the manual one. Staff in the forecast department office is available round the clock (24 hours) in two shifts. Each shift contains five personnel.

Automatic rain gauge:

The graph paper is changed after every twenty four hours. Minimum reading recorded is 0.1mm. During normal conditions daily rainfall is recorded, while during emergency rainfall intensity of fifteen minutes, half hourly and hourly is also recorded. Various rainfall intensities are available only at automatic rain gauge stations like RAMC.

Manual rain gauge:

This rain gauge records the reading up to a minimum of 0.5mm. Three hourly data is available from this rain gauge. The difference between the reading of automatic and manual rain gauge is very small. The fifteen-minute and other intensities are not available in this system.



Automatic rain gauge



Weather observation machines at PMD



Manual rain gauge

There are four types of high frequency (HF) radio waves used for SSB (Single Side Band) through which there is linkage between the PMD office and the entire country. The four frequencies are given below.

- 3209.5 KHz, 6760.5 KHz, 7692.5 KHz, 9283.5 KHz

The antenna in the main PMD building is connected to the nearby exchange facility through UHF (the exchange facility is visible from PMD). In Lahore, the Flood Forecasting Department receives data by telemetry through Doppler Radar from three various stations situated in the outskirts of Lahore. The frequency is UHF (402 MHz).



HF antenna



HF transmission equipment



Rainfall observation radar



UHF antenna for the radar



Transmission equipment for the rader



Available rooms for installing the rain gauge equipment

1.2 Saidpur

This station, located near Daman-e-koh, is basically a seismic center. The office was established in 1980 and the rain gauge was installed in 1989. About 27 people work with 3-alternation system in this observatory.



Saidpur Station



Manual rain gauge



Power supply equipment

Rainfall is recorded at 8:00 AM everyday. However, in rainy season, which starts from the 1st of July to the 30th of September, rainfall is recorded on hourly or three-hourly basis, or as often as required. Since the rain gauge installed is manual, during a very heavy rain the staff assigned has to check the instrument, and as soon as the bucket becomes full, he has to empty it, measure the rainwater and again put the bucket back to measure further rainfall. After recording the rainfall data, the staff assigned reports it to the PMD by telephone.

Although the commercial power supply is usually used, a solar panel is installed on the roof as the emergency power supply.



Solar panel



Battery and charger for the solar panel



Available rooms



Available space to install a mast

The heaviest rainfall was recorded between 5:00AM to 2:00PM on 23 July 2001.

Period	Rainfall (mm)
5:00 AM to 8:00 PM	103.5
8:00 AM to 11:00AM	125.0
11:00 AM to 2:00 PM	67.0
2:00 PM to 5:00 PM	18.2
5:00 PM to 8:00 PM	17.0

1.3 Rawalpindi Agromet Centre (RAMC)

Automatic and manual rain gauges have been installed right since its establishment in 1989. The difference between readings of the automatic and manual rain gauges is about 0.5mm. The minimum reading of automatic rain gauge is 0.1mm.

Seven personnel are on duty during daytime.



Rawalpindi Agromet Centre



Weather observation machines at RAMC



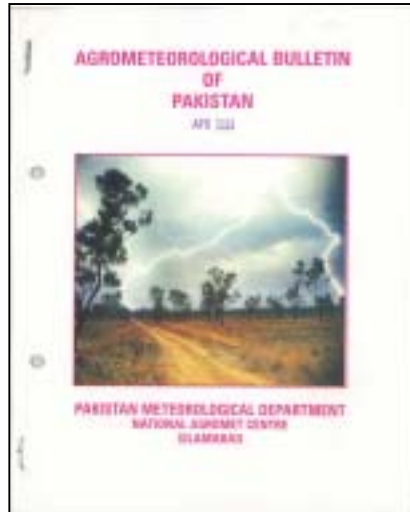
Manual rain gauge



Automatic rain gauge

Rainfall is recorded at 8:00 AM everyday. However, during rainy season, that is, from the 1st of July to the 30th of September, one person works round the clock, and rainfall is recorded every three hours or every one hour, or as often as required. The recorded rainfall data is reported to PMD at 8:00 AM by telephone. At the end of each month, other data such as temperature, wind and other agriculture-related data are sent to PMD. PMD includes the data in its monthly report.

At present, RAMC has no plan to construct a new building in its premises. Therefore, there is enough space to install a new rain gauge and a mast for the telemetry system.



PMD's monthly report



Power supply equipment



Available rooms



Available space to install a mast

Heavy rainfall recorded on 23rd July 2001 is as follows.

Period	Rainfall (mm)
5:00 AM to 8:00 PM	4.0
8:00 AM to 11:00AM	282.6
11:00 AM to 2:00 PM	48.0

1.4 Chaklala

The Chaklala rain gauge station is located in Islamabad International Airport, and the admittance of foreigners to the observatory is strictly regulated because of the territorial jurisdiction of the army. Therefore, field investigations could not be done although the application for admittance was filed through PMD.

According to PMD, the automatic rain gauge was installed in 1951; however, it was demolished in 1987, and only a manual rain gauge is installed at present. In addition, twenty-two personnel are working for 24 hours, and rainfall is observed in every 3 hours.

It seems that there is some difficulty on the installation of a rainfall observation system using the radio at this rain gauge station, because the army does not permit the use of telecommunication by radio and the establishment of a communication tower.

Detailed information about this station is not available.

2. EXISTING WATER LEVEL GAUGE STATION

2.1 Gawal Mandi Bridge

A new bridge is under construction with the river improvement project by ADB's financial assistance. The water level gauge installed has already been demolished because of this project. A temporary water level gauge will be installed behind the fire brigade building on the lower reaches of Gawal Mandi Bridge before the monsoon comes this year 2003.

The purpose of the water level gauge was to standardize the decision to sound a flood warning siren. Therefore, there is a request from the fire brigade for a permanent water level gauge installed behind the fire brigade office, although it will be reinstalled at the Gawal Mandi Bridge after the completion of the ADB project.



Gawal Mandi Bridge



The lower reaches side



The upper reaches side

2.2 Ratta Amral Bridge

As in the case of Gawal Mandi Bridge, when water level reaches sixteen feet at Ratta Amral Bridge, the head office of the fire brigade shall decide on the sounding of warning sirens. The details are given in Chapter 3, Warning Post.



Ratta Amral Bridge



The upper reaches side