GOVERNMENT OF PAKISTAN

MINISTRY OF WATER RESOURCES

ANNUAL FLOOD REPORT 2017

OFFICE OF THE CHIEF ENGINEERING ADVISOR &
CHAIRMAN FEDERAL FLOOD COMMISSION
ISLAMABAD

ANNUAL FLOOD REPORT-2017

District Sialkot (Punjab)

Karachi (Sindh)

District Chitral (KP)

District Quetta (Balochistan)

District Gilgit (Gilgit-Baltistan)

District Bagh (Azad Jammu & Kashmir)

OFFICE OF THE CHIEF ENGINEERING ADVISOR &
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EXECUTIVE SUMMARY

Pakistan is one of the most disaster-prone countries in the world. Flood constitutes one of the world's most serious environmental hazards associated with global climate change, as witnessed by the Pakistan during past 6-7 years. Under future climate change scenarios, country is likely to experience increased variability of river flows due to increased variability of precipitation and melting of glaciers. Demand for irrigation water may increase due to higher rates of evaporation. Urban storm drainage networks may also be stressed by torrential rainfall and flash floods during monsoon season. Sea level rise and storm surges may adversely affect coastal infrastructure and livelihoods in coming years.

Concerted efforts like improved weather and flood forecasting including warning systems, retrofitting of critical infrastructure and construction of new flood protection embankments/shore protection works, construction of additional flood water storages, development or use of crop varieties with greater heat and drought tolerance, modernizing irrigation techniques, employing water-saving technologies and integrated watershed management are required to mitigate the threats due to global climate change.

The National Climate Change Policy of 2012 is Pakistan's guiding document on climate change, setting out the goal of achieving climate-resilient development for the country through mainstreaming climate change in the economically and socially vulnerable sectors of the country. As described in its Nationally Determined Contribution to the Paris Agreement under the United Nations Framework Convention on Climate Change, Pakistan intends to reduce up to 20% of its 2030 projected greenhouse gas emissions, subject to availability of international grants to meet the cumulative abatement costing around US $ 40 billion. The country's adaptation needs have been identified to range between US $7 billion to US $14 billion per year.

Pakistan has consecutively faced series of flood events during the past 6-7 years i.e. since 2010, which indicates that flood has now become a regular feature in the country. This is exacerbated by the inadequate surface water storage capacity for absorbing flood peaks, chronic and increasing threat of encroachments in flood plains, inadequate discharge capacity of some of Barrages/Bridges, inadequate budget allocation under PSDP and Provincial ADP for execution of flood projects, weakness in flood defenses due to improper maintenance of existing flood protection structures and importantly a distorted natural drainage network.

Pakistan has suffered a cumulative financial loss of more than US$ 38 Billion during the past 70 years. Around 12,502 people lost their lives, some 197,273 villages damaged/ destroyed and an area more than 616,598 Sq.km was affected due to 25 major flood events. The 2010 floods were worst flooding in the past about 80 years in the region **(Table-2)**.

Prior to 1977, the Provincial Governments were responsible for planning and execution of flood protection works. Disastrous floods of 1973 & 1976 caused heavy loss to life and property. Heavy losses to the economy due to those floods were discussed in the Inter-Provincial Conference held in January 1977. It was felt that the existing flood protection facilities and planning were inadequate to provide effective protective measures for the country; hence, it was decided to establish Federal Flood Commission (FFC) for integrated flood management on country wide-basis.

Since its establishment, FFC has prepared three National Flood Protection Plans, i.e. National Flood Protection Plan-I (1978-88), National Flood Protection Plan-II (1988-1998) & National Flood Protection Plan-III (1998-2008), which were executed through Provincial Irrigation Departments and Federal Line Agencies. Besides this, two mega Flood Damages Restoration Projects (1988-FDRP & 1992 &1994-FDRP) had also been undertaken by FFC. A total investment of more than **Rs 30.00 billion** has been made on construction/ rehabilitation of around 5,483 flood protection structures including up-gradation of country's existing Flood Forecasting & Warning System through PSDP/Foreign Aided Programme during the past 39 years **(Table-4)**.

Work on preparation of National Flood Protection Plan-IV was started in year 2006-07, but it could not be approved for implementation at that time due to low priority given to Flood Sector as result of drought like conditions over the country. Due to large scale damages as a result of 2010 floods, followed by subsequent flood events during 2011 & 2012, the need for investment in flood sector gained importance. Hence, Federal Flood Commission re-started working on formulation of National Flood Protection Plan-IV. For that purpose, consultants were engaged in May 2013 through World Bank Funded Water Sector Capacity Building & Advisory Services Project (WCAP).

The National Flood Protection Plan-IV (Ten-year Plan) had been prepared in close consultation with all stakeholders at Federal and Provincial Governments level keeping in view the lessons learnt from past flood events. The final version of NFPP-IV (Ten-year Plan) was submitted by the consultants in May 2015, which was forwarded by the Ministry of Water & Power (now Ministry of Water Resources) to Ministry of Inter Provincial Coordination for approval of Council of Common Interests (CCI). The Plan was approved by CCI in its meeting held on 2nd May 2017.

The draft Umbrella PC-I for implementation of interventions proposed under NFPP-IV prepared by the Consultants was considered by the Scrutinizing Committee (S.C) of FFC in its meeting held on 15th December 2017. Certain amendments were proposed by the Committee in the Umbrella PC-I. The amended Umbrella PC-I (received from consultants) has been circulated among the provinces in last week of February 2018 for getting its clearance from their respective PDWP. This shall be followed by the final technical scrutiny of the Umbrella PC-I by the Scrutinizing Committee of FFC once it is cleared by the PDWP of the four provinces. Thereafter, it would be submitted to Ministry of Planning Development & Reforms through Ministry of Water Resources for consideration/approval of the CDWP/ECNEC.

The Concept Clearance Paper titled "Implementation of National Flood Protection Plan – IV (10-Year Plan)" has been prepared on the basis of guidelines of Planning Commission and submitted to Ministry of Water Resources for onward transmission to Planning Commission for approval by CDWP. Economic Affairs Division (EAD) would be approached for seeking external donors financing for implementation of sub-projects provided in the umbrella PC-I as soon as the Concept Clearance Paper is approved by CDWP.

2017 Floods:

Flood flows triggered by torrential rains affected various parts of country during monsoon season 2017, including four provinces, Gilgit-Baltistan, FATA and some parts of AJ&K. Moderate to heavy downpour in upper catchments of major rivers and their tributaries generated flood flows, which caused losses to human lives and damages to private and

public infrastructure. 2017-rains/ floods claimed 172 lives, 167 injured and damaged 440 houses.

Recommendations/Way Forward:

Irrigation Department of the four provinces (PIDs) and concerned Federal Line Agencies, (WAPDA, PMD, PCIW, GB-PWD, Irrigation Directorate FATA, Irrigation & Small Dams Organization, Government of AJ&K) may take immediate action on the following recommendations for early compliance (as also reflected in minutes of FFC's Post Flood Meeting held on November 22, 2017) for safe passage of monsoon season 2018;

i. PIDs & Federal Line Agencies to complete all ongoing flood protection works being executed through Public Sector Development Programme (PSDP), Provincial Annual Development Programme or any other Programme, well before the start of Monsoon Season 2018.

ii. The Irrigation, Drainage & Flood Protection Infrastructure damaged during previous floods may be restored/rehabilitated on fast track basis, so as to complete the task well before the start of Monsoon Season 2018.

iii. Pre-monsoon inspection of all Flood Protection Infrastructures (flood bunds, spurs etc.), Barrages/Head Works and their allied components etc. may be carried out jointly with concerned Corps of Engineers, well in time, and critical reaches as identified by the inspection teams may be got repaired/strengthened well before the start of Monsoon Season 2018.

iv. Adequate O&M funds for Flood Protection Infrastructures may be arranged through Provincial Budget and all urgent nature O&M works related to Irrigation, Drainage & Flood Protection Infrastructures may be completed well before the start of Monsoon Season 2018.

v. PID Punjab, NHA and Pak. Railways to make necessary arrangements of explosive and others flood fighting material at sites of pre-determined breaching sections in close coordination with concerned Corps of Engineers. Stone reserve stock/ flood fighting material may also be arranged at all critical reaches of flood embankments well before start of monsoon season 2018.

vi. Contingency Plans/Flood Fighting Plans may be prepared by the PIDs & Federal Line Agencies including NHA and Pak. Railways including PDMAs/GBDMA/ FDMA/SDMA keeping in mind lessons learnt during the past flood events and circulated among concerned organizations including FFC.

vii. The encroachments may be removed from flood plains/waterways of main & other rivers including hill torrents and drainage network particularly along Bara Kas Nullah (draining out the flood flows of emergency spillway of Mangla reservoir) and main Jhelum river downstream Mangla, besides, removal of settlement on flood protection structures well before the start of Monsoon Season 2018.

viii. PIDs & WAPDA to carry out all essential O&M Civil & E/M works of all Barrages/ Headworks well before start of monsoon season 2018.

ix. WAPDA & Pakistan Metrological Department/FFD, Lahore may carry out all essential O&M works of Flood Forecasting and Warning System equipment well in time and ensure that System is fully functional before start of Monsoon Season 2018.

x. The links for coordination among flood management related organizations at Federal & Provincial Government level needs to be further improved keeping in mind the experiences of past flood events. The members of FMC of Mangla Dam Projects may link up themselves with Mangla Dam Authorities (through video link system) for better coordination during upcoming Monsoon Season 2018.

xi. PCIW may keep continue its efforts on making necessary arrangements with Indian Counterpart for obtaining discharges of Eastern Rivers and Chenab River flood flow data at Salal HEP (located about 56 KM upstream of Akhnoor bridge) across Chenab River, besides inflows & levels of reservoirs across Eastern rivers i.e. Bhakra, Pong & Thein Dam Projects and its transmission to end users (FFC, PMD/FFD, Lahore, WAPDA, NDMA & PDMAs etc.) during Monsoon Season 2018.

xii. WASA Rawalpindi may carry out desilting work of critical sections of Lai Nullah well before the start of Monsoon Season 2018. TMA & City District Government may expedite action on demarcation of water way of Lai Nullah and also take necessary steps for removal of encroachments on banks/waterway of Lai Nullah, besides, stoppage of dumping solid wastes/garbage & building material in bed of Lai Nullah.

xiii. PIDs & FLAs including NDMA, PDMAs, GBDMA, FDMA & SDMA may ensure effective use of Flood Plain Inundation maps already circulated by FFC among all concerned organizations for better flood management during Monsoon Season 2018.

xiv. Under the increasing flood threat in the context of climate change, allocation of funds by Provincial governments under Provincial ADP and by Federal government under PSDP for execution of works proposed under recently approved NFPP-IV (Ten Year Plan), besides, allocation of adequate budget under PSDP for execution of urgent nature flood works through Normal/Emergent Flood Programme may be enhanced as per actual needs of the provinces and federal line agencies.

xv. The Concept Clearance Paper and Umbrella PC-I of NFPP-IV may be processed for early approval of concerned fora. Efforts may be made to explore possibility of funds (as per schedule given in Umbrella PC-I of NFPP-IV) through GOP resources/ external donors e.g. World Bank, ADB, JICA, UNESCO, GCF etc. through EAD.

xvi. Water Sector is not effectively seen in overall scope of CPEC. A part of NFPP-IV may be considered for financing under CPEC to ensure protection from visible Hydro Meteorological hazards (Rains, floods, flash floods, riverine floods, coastal sea surges/ floods, urban floods, droughts etc.) in the entire CPEC path within Pakistan and possible within the CPEC region in Phase-II.

ACKNOWLEDGEMENT

The preparation of Annual Flood Report of Federal Flood Commission commenced from 1998 with a view to compile essential information on yearly basis for documentation of the yearly flood events, flood flow data, lessons learnt from previous flood events and exploring the needs for future protective measures.

The 2017 Annual Flood Report contains inter-alia, information about historical floods in Pakistan, flood management works, functions of FFC & other concerned Provincial and Federal Government organizations, flood forecasting and warning dissemination system, besides, flood preparedness activities carried out during the monsoon season 2017. The report focuses on floods experienced during monsoon season 2017, which reportedly caused damages to private and public infrastructure in various parts of country, especially in Balochistan and Gilgit-Baltistan.

Services of following officers are greatly acknowledged who contributed in a dedicated manner for the preparation of 2017-Annual Flood Report of Federal Flood Commission:

Sr. No.	Name	Designation	Role
1.	Mr. Alamgir Khan	Chief Engineer (Floods)	Supervisory
2.	Mr. Ashok Kumar	Superintending Engineering (Floods)	Contributory
3.	Mr. Muhammad Hanif Chachar	Deputy Director (S&M)	Contributory
4.	Mr. Zafar Iqbal	Senior Engineer (Floods)	Contributory
5.	Mr. Husain Shigri	Senior Engineer (Floods)	Contributory
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7.	Mr. Yawar Rasheed	Assistant Engineer (Floods)	Contributory

FLOODS IN GENERAL PERSPECTIVE

1. FLOODS IN GENERAL PERSPECTIVE

1.1 Flood Problem in Perspective

The riverine floods take hours or even days to develop, giving ample reaction time to locals to prepare/evacuate. However, flash floods generate quickly in mountainous regions with little warning/reaction time for locals. Flash floods can be extremely dangerous, instantly turning a babbling brook into a thundering wall of water and sweeping everything on its way downstream. Floods occur in all types of rivers and their tributaries. Localized flooding may be caused or exacerbated by drainage obstructions such as landslides, ice, debris, or dam failure. The increase in flow may be the result of sustained rainfall, rapid snow melting, Monsoon/Depression (Weather System) or tropical cyclones. Rapid flood events including flash floods, more often occur on smaller rivers, rivers with steep valleys or rivers that flow for much of their length over impermeable terrain. The cause may be localized convective precipitation (intense thunderstorms) or sudden release from an upstream impoundment created behind a dam, landslide or glacier.

Disaster experts classify floods according to their likelihood of occurring in a given time period. A hundred-year flood, for example, is an extremely large, destructive event that would theoretically be expected to happen only once every century. But this is a theoretical number. In reality, this classification means there is a one-percent chance that such a flood could happen in any given year. Over recent decades, possibly due to global climate change, hundred-year floods have been occurring worldwide with frightening regularity.

Climate change is considered to be a critical global challenge and recurring flood events have demonstrated the growing vulnerability to climate change. The impacts of climate change range from affecting agriculture to further endangering food security, to rising sea levels and the accelerated erosion of coastal zones, increasing intensity of natural disasters like floods & droughts, species extinction and the spread of vector-borne diseases.

It is generally recognized that complete prevention from floods is humanly impossible, but protection from flood is feasible and is a vital necessity. By proper planning, means can be devised to harness the fury of floods to safeguard human life and property. Devoid their destructive power, floods can be used in the service and the welfare of a community.

1.2 Floods Hydromet dynamics in Pakistan

Pakistan with a population of around 207.774 million (Source: 2017 Census of Pakistan) is located between latitude 24 ^{0} N and 37 ^{0} N and encompasses an area of about 796,000 KM^2. It has lofty mountains with towering peaks/heights ranging upto 28,000 feet and mighty rivers having peak flood discharges more than a million cusecs. It is bounded on the north by Himalayan Mountain Ranges and its offshoots. The northern mountain barrier influences the rainfall pattern in Pakistan by intercepting monsoon winds from the south and southwest (Westerly Waves) and eastern side (Monsoon Weather Systems originating from the Bay of Bengal, India).

Snow melting from the mountains and heavy precipitation in the catchment areas feed the River Indus and its major tributaries i.e. Sutlej, Beas, Ravi, Chenab, Jhelum & Swat, Kabul, besides, other Secondary & Tertiary Rivers, which is one of the mighty river systems of the world. The flow in the rivers, which is the lifeline for the economy of

Pakistan, sometimes turns into destructive floods and results in heavy damages to public and private sector properties besides loss of precious human lives. High floods are sometimes caused by the formation of temporary natural dams by landslide or glacier movements and their consequent collapse (GLOFs).

Pakistan is a country with diverse type of land and fluctuating pattern of climate. Climate is usually considered hot and dry in Pakistan but it has shown significant obvious variations in last few years. Many districts and urban centers located along the rivers banks are ever on a great risk to confront with various types of floods i.e. riverine flood, flash flood and urban floods particularly in Punjab & Sindh provinces. The floods cause damages to hundred thousand acres of fertile agricultural lands, standing crops and affect adjoining abadies with monetary loss in billions of rupees. Major direct flood damages in the country are caused to agricultural lands, standing crops, urban and rural abadies, besides, other private & public property.

The riverine floods are generally caused due to heavy concentrated rainfall in the rivers catchments, during monsoon season, which is sometimes augmented by snow melt flows. Monsoon currents originating from Bay of Bengal and resultant depressions (weather system) often result in heavy downpour in the Himalayan foothills, which occasionally generate destructive floods in main rivers and their tributaries. Sometimes exceptionally high flood flows in major rivers are generated due to formation of temporary natural dams by landslide or glacier movement and their subsequent collapse.

Flooding of the Indus River and its tributaries represents the greatest hazard in Pakistan. Floods occur usually in summer season (July - October). Therefore, damages to agriculture sector are mainly to the standing Kharif crops. However, in some cases the inundated lands do not dry up in time and ultimately affecting sowing Rabi crops.

The major rivers (Indus, Jhelum, Chenab, Ravi, Sutlej) and secondary rivers (Kabul, Swat etc.) cause flood losses by inundating low lying areas round the rivers bed by damaging irrigation and communication network, besides, land erosion along the rivers banks. In the upper part of the Indus Basin (Punjab & Khyber Pakhtunkhwa), floodwater spilling over the high banks of the rivers generally turns back to the main rivers channel.

In the lower parts of the country i.e. Lower Indus Basin (Sindh province), River Indus is flowing at ridge i.e. higher elevation than adjoining lands. That is why flood embankments have been provided along both sides of the river. The flood water, if breaches the embankments do not return to the main river channel. This largely extends the area and period of inundation resulting in more damages to abadies, standing crops and other private as well as public infrastructure.

Sometimes breaches are occurred in the flood embankments, when the rivers attain the Exceptionally High Flood Level *{LMB Taunsa Barrage in Punjab & Tori Bund Complex in Sindh Province incidents during 2010-Floods}.* At times, the flood embankments are breached at pre-determined locations to save the main structures across main rivers *(RMB Jinnah Barrage was operated during Flood Season 2010).* The remodelling/ rehabilitation works of barrages, on the basis of 100 years return period, were taken up by the Punjab & Sindh province. The rehabilitation of Kalabagh Barrage has been completed and Suleimanki Barrage was near to completion. The capacity enhancement of Khanki, Trimmu and Balloki Barrages was also near to completion and Panjnad Barrage will be completed by March 2019. Discharge capacity of Guddu Barrage has been reduced form 1,500,000 cusecs to 900,000 cusecs. In accordance with the discharge capacity of Sukkur

Barrage it will be rehabilitated to 1,200,000 cusecs. Kotri Barrage was rehabilitated in 1998 and it's rehabilitation is not required.

1.3 Flood Control Objectives

Flood management planning in Pakistan is being carried out to essentially cover the following three specific objectives:

i. To reduce or eliminate damages to existing properties;
ii. To prevent future increase in damages; and
iii. To mitigate the residual hazards.

1.4 Flood Problem, Physiographical Dimensions

In Pakistan, flood control planning is a complex problem and calls for great ingenuity and experience on the part of the planners. The nature of flood problems varies in each of the four provinces and federally administered areas due to varying physiographic, climatic, demographic, and socio-economic conditions. Even the characteristics of catchment areas of various rivers differ from each other. Flood problems relating to various provinces are given as under:

1.4.1 Punjab

In Punjab, the flood protection marginal bunds have been generally constructed either to protect Headworks and other irrigation structures, or to safeguard certain towns, villages & adjoining agricultural lands. Due to general topography of the area, pre-determined breaching sections have been provided in the Right Marginal Bunds (RMBs) for operation for safety of Headworks/ barrages in case of exceptional high flood flows i.e. likely to exceed the designed level. In order to protect areas from erosion, spurs have been constructed in critical reaches. These spurs have protected vast areas and in some cases even large tracks of eroded lands have been reclaimed.

1.4.2 Sindh

The Indus River flows on a ridge in Sindh Province and generally, surrounding areas (outside the flood embankments) are lower than the river bed; hence, water once leaving the Indus River does not return to the main channel. The escaped water thus causes greater damage to widespread areas, and it persists for a longer period even after flood peaks are over *(Refer Tori Bund, M.S Bund breaches during 2010-Flood Season).*

Sindh province is situated at tail end, hence, drain out all rivers and if flood protection measures adopted in the upper Sindh are not properly planned, severe damages are likely to occur in the Province. In most of the reaches, a double line of flood embankments has been constructed on both sides of the river from Guddu to few kilometers short of Arabian Sea. These flood embankments have been further compartmentalized to contain widespread inundation.

1.4.3 Khyber Pakhtunkhwa

In Khyber Pakhtunkhwa, the floods are mainly due to flash flood flows in secondary rivers (Kabul, Swat, Panjkora, Kurram etc.) and major hill torrents/flood flow generating nullahs having steep bed slopes, which greatly increase flood velocity and severely erode the

banks. In Khyber Pakhtunkhwa, mostly flood protection walls/embankments and short spurs have been constructed to save the areas from spill action and erosion. Around 40 spurs having considerable shank length and Marginal Bund have been constructed along the right bank of Indus River "Chashma Barrage – Ramak Reach" for protection of D.I. Khan City and adjoining area from devastating flood flows of Indus River. A large number of spurs and flood embankments/flood protection walls in critical locations have also been constructed along Kabul, Swat, Panjkora, Kurram rivers and their tributaries including flood flows generating nullahs/hill torrents.

1.4.4 Balochistan

Due to peculiar physiographic and climatic characterizes in Balochistan, the bed slopes of rivers and nullahs in Balochistan are very steep; hence, generate flash flood flows with high velocity causing banks erosion and inundations of low lying area along the banks of rivers and their tributaries. Mostly flood protection walls/embankments & short spurs have been constructed for protection of orchards, agricultural lands and abadies. Flood flows regulators/ flood diversion structures have also been constructed to dissipate the thrust of flood water and use the same for agriculture in the area.

1.4.5 Gilgit-Baltistan, FATA & AJK

The bed slopes of rivers and nullahs in Gilgit-Baltistan, FATA and AJ&K are very steep. The flash flood flows generated in main rivers and their tributaries cause severe banks erosion. Flood Protection walls and short spurs in PCC & gabion crates are constructed in order to check the spill and erosive action of flood flows in rivers/hill torrents. The main purpose of such interventions is to provide protection to abadies, agricultural lands and other private and infrastructure.

1.5 Irrigation Network & Water Resources in Pakistan

Five main rivers, namely, the Indus, Jhelum, Chenab, Ravi and Sutlej and their tributaries flow through the country's plains. The Indus, Jhelum and Chenab are known as the **Western Rivers** and Ravi, Beas, and Sutlej known as the **Eastern Rivers**. These rivers supply water to the entire Indus Basin Irrigation System. The rivers have their origin in the higher altitudes and derive their flows mainly from snowmelt and monsoon rains.

The catchment area of Indus is most unique in the sense that it contains seven (7) of the world's highest-ranking peaks, after Mount Everest. These include **K-2 (28,253 feet), Nanga Parbat (26,660 feet), Rakaposhi (25,552 feet)** etc. Likewise, barring the polar areas, seven (7) glaciers situated in the Indus catchment, **namely Siachin, Hispar, Biafo, Batura, Baltoro, Barpu and Hopper** are amongst the largest in the world.

The Irrigation System of Pakistan is the largest integrated irrigation network in the world, serving around 45 million acres of contiguous cultivated land. The system is fed by the waters of the Indus River and its tributaries. The irrigation network of Pakistan mainly comprises of 3 major reservoirs (Tarbela, Mangla & Chashma), 19 Barrages, 12 inter-river link canals, 45 independent irrigation canal commands and 143 medium dams (having height 15 meters and above).

The major storage reservoirs include Tarbela (*existing Live Storage Capacity = 6.174 MAF against original storage capacity of 9.70 MAF),* Chashma *(existing Live Storage Capacity = 0.276 MAF against original storage capacity of 0.70 MAF)* on River Indus

and Mangla with existing Live Storage Capacity = 7.406 MAF *(this includes the additional storage capacity of 2.88 MAF after Mangla Dam Raising allowing Maximum Conservation Level of 1242 feet)* against original storage capacity of 5.34 MAF on River Jhelum.

The schematic diagram of Indus Basin Irrigation System is given at **Figure-1.** Diversion of river waters into off-taking canals is made through Barrages, which are gated diversion weirs. The main canals in turn deliver water to branch canals, distributaries and minors. The watercourses get their share of water through outlets in the irrigation channels. Distribution of water from a watercourse is made through a time-schedule called "Warabandi".

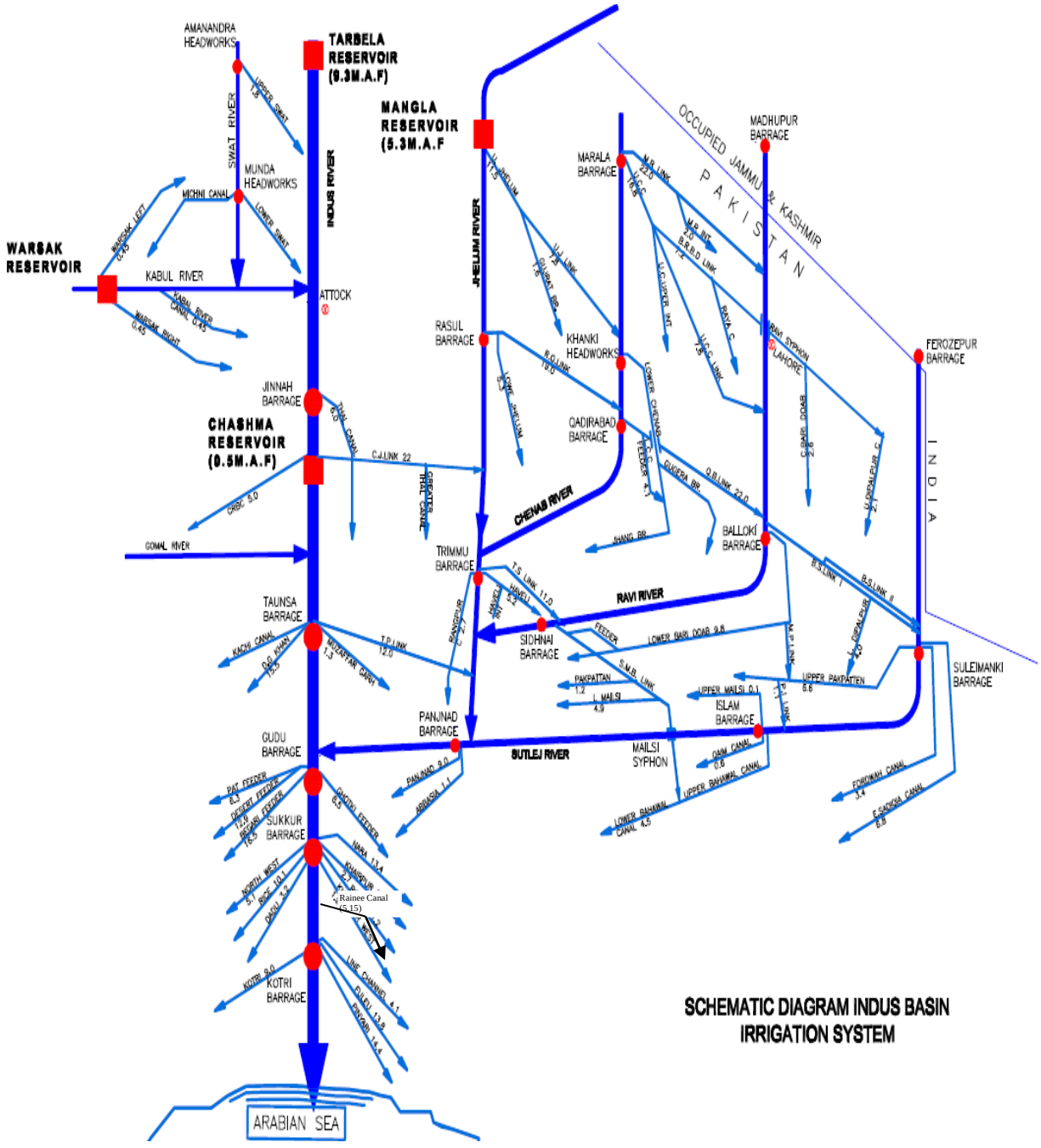


Figure 1: Schematic Diagram of Indus Basin Irrigation System

1.6 FLOOD PROTECTION FACILITIES IN PAKISTAN

The existing flood management strategy includes flood flows regulation by three major reservoirs (Tarbela, Chashma on Indus & Mangla on Jhelum), protection of important private & public infrastructure, urban/rural abadies and adjoining agricultural lands located along the rivers banks by flood embankments and spurs & other interventions, besides, Flood Forecasting & Early Warning System, Rescue & Relief measures in case of flooding situation. As per inventory developed by M/s NESPAK under Task-B of NFPP-IV studies completed in May 2015, zonal/ regional distribution of existing flood protection works in the four provinces and federal line agencies is given in **Table-1**.

TABLE-1

EXISTING FLOOD PROTECTION INFRASTRUCTURE

Sr. No.	Zone/Region/ Agency/District	No. of Protection Works
Punjab*		
1.	Lahore Irrigation Zone	251
2.	Faisalabad Irrigation Zone	71
3.	Sargodha Irrigation Zone	325
4.	Multan Irrigation Zone	231
5.	Bahawalpur Irrigation Zone	89
6.	D.G. Khan Irrigation Zone	218
	Sub-Total	**1,185**
Sindh		
1.	Guddu Barrage	63
2.	Ghotki Feeder Canal Area Water Board (SIDA)	23
3.	Sukkur Barrage Right Bank	48
4.	Sukkur Barrage Left Bank	78
5.	Kotri Barrage	42
6.	Left Bank Canal Area Water Board (SIDA)	07
	Sub-Total	**261**
Khyber Pakhtunkhwa^		
1.	North Irrigation Zone	439
2.	South Irrigation Zone	345
	Sub-Total	**784**
Balochistan		
1.	North Irrigation Zone	159
2.	South Irrigation Zone	96
3.	Canal System Dera Murad Jamali	05
	Sub-Total	**260**
Gilgit-Baltistan		
1.	Gilgit	02
2.	Hunza/Nagar	08

Sr. No.	Zone/Region/ Agency/District	No. of Protection Works
3.	Skardu	04
4.	Ghizar	04
5.	Astore	02
6.	Ghanche	09
7.	Diamer	01
	Sub-Total	**30**
FATA		
1.	Bajaur	12
2.	Khyber	21
3.	Kurram	41
4.	Mohmand	8
5.	Orakzai	9
6.	North Waziristan	9
7.	South Waziristan	42
8.	FR Bannu	5
9.	FR D.I. Khan	26
10.	FR Kohat	15
11.	FR Lakki	7
12.	FR Tank	14
	Sub-Total	**209**
AJ&K		
1.	Bagh	03
2.	Bhimber	06
3.	Kotli	01
4.	Mirpur	01
5.	Muzaffarabad	02
	Sub-Total	**13**
	Grand Total	**2,742**

* Bund/Embankment 375, Flood Protection Wall 19, Spur / Stud 771 & Flood Dispersion Structure 20 = Total 1185
^ Embankment / Bund 105, Flood Protection Wall 455, Spur / Stud 223, & Flood Dispersion Structure 01 = Total 784

1.7 IMPACT OF GLOBAL WARMING & CLIMATE CHANGE ON FLOOD MANAGEMENT

Global warming causes climate change, which is a serious issue for the entire world. It is a serious threat to the third world as its impacts will not be felt equally across our planet. Developing countries including Pakistan are much more vulnerable to the impacts of climate change. The melting rate of glaciers in South Asia has increased, which may cause floods in Pakistan and surrounding countries in the coming years. Pakistan economy has faced significant losses due to environmental damages and degradations.

Pakistan is amongst the top ten countries on the globe experiencing frequent and intense climate change events such as floods, droughts, cyclones, heavy rains, extremely high temperatures, etc. The average global temperature has increased due to increasing

concentrations of carbon dioxide and other greenhouse gases in the atmosphere for last many years. During the last century, it increased by 0.6 degree Centigrade and is likely to increase further by 1.0 ^{o}C to 4.0 ^{o}C till the end of the current century.

The most recent extreme climate events witnessed by Pakistan are floods hitting various parts of the country during the monsoon season. Pakistan has experienced flooding almost every year since 2010 which caused huge damages to life and property. The water security of the country is also threatened by the climate change. The increasing temperatures in the northern mountains of the country were likely to result in glacier melting, thereby affecting the flows of Indus River System.

1.8 HISTORICAL FLOOD EVENTS & DAMAGES IN PAKISTAN

Floods almost every year destroy considerable land area/standing crops and affect and displace millions of people. It is the most frequent natural hazard being faced by the country since its creation in 1947. Due to global warming and rapid climate change, frequency of occurrence of floods has increased from the past several years. Since its creation, Pakistan has faced various severe flood events.

Owing to adverse impacts of climate change, in the recent years, vulnerabilities of communities to coastal & urban flooding have also increased. Flood damages are caused mainly due to riverine flooding in main rivers and flash floods in Secondary & Tertiary Rivers/Hill Torrents, Coastal flooding due to Cyclone & urban flooding due to torrential rains and inadequate storm drainage facilities, besides, GLOFs in northern parts of the country.

During the past sixty-seven years, the total losses ascribable to major floods events in Pakistan are more than **US$ 38.171 Billion** while nearly 12,502 people lost their lives out of which 50% of total direct losses in history had been observed in last 6-7 years since 2010, as highlighted in **Figure-2.**

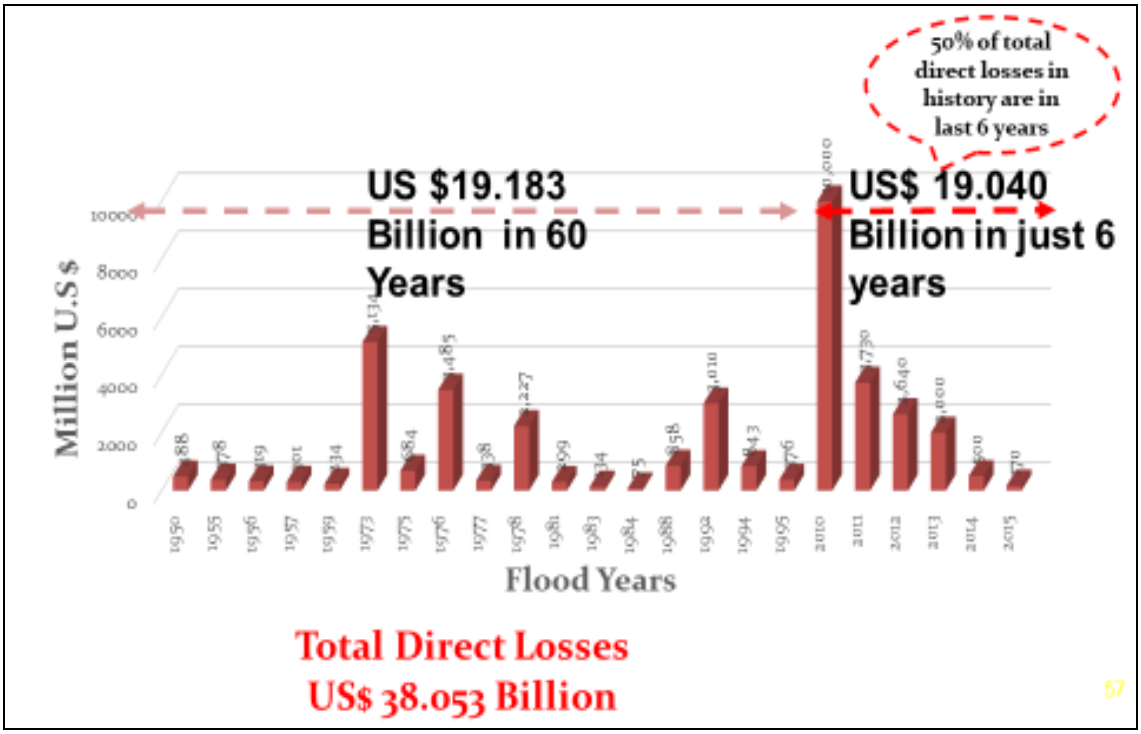


Figure 2: Total direct losses of Pakistan Economy due to Floods

The historical major flood events and the total losses ascribable to these major floods experienced in Pakistan are given in **Table-2**.

TABLE-2

HISTORICAL MAJOR FLOOD EVENTS EXPERIENCED IN PAKISTAN

Sr. No.	Year	Direct losses (US$ million) @ 1US$= PKR 86	Lost lives (No)	Affected villages (No)	Flooded area (Sq-km)
1	1950	488	2,190	10,000	17,920
2	1955	378	679	6,945	20,480
3	1956	318	160	11,609	74,406
4	1957	301	83	4,498	16,003
5	1959	234	88	3,902	10,424
6	1973	5134	474	9,719	41,472
7	1975	684	126	8,628	34,931
8	1976	3485	425	18,390	81,920
9	1977	338	848	2,185	4,657
10	1978	2227	393	9,199	30,597
11	1981	299	82	2,071	4,191
12	1983	135	39	643	1,882
13	1984	75	42	251	1,093
14	1988	858	508	100	6,144
15	1992	3010	1,008	13,208	38,758
16	1994	843	431	1,622	5,568
17	1995	376	591	6,852	16,686
18	2010	10,000 @ 1US$= PKR 86	1,985	17,553	160,000
19	2011	3730* @ 1US$= PKR 94	516	38,700	27,581
20	2012	2640** @ 1US$= PKR 95	571	14,159	4,746
21	2013	2,000^ @ 1US$= PKR 98	333	8,297	4,483
22	2014	440^^ @ 1US$= PKR 100.89	367	4,065	9,779
23	2015	170# @ 1US$= PKR 105.00	238	4,634	2,877
24	**2016**	**6#** @ 1US$= PKR 104.81	**153**	**43**	-
25	**2017**	**-**	**172**!	**-**	-
Total		**38,171**	**12,502**	**197,273**	**616,598**

* *Economic Survey of Pakistan 2011-12*

** *Thomson Reuters Foundation (http://www.trust.org/item/20130909134725-rm708/)(Agriculture sector)*

^^ *Economic Survey of Pakistan (2014-15)*

\# *Based on PIDs & FLA's interim reports related to irrigation, drainage & flood protection infrastructure only*

! *Source: NDMA*

The unprecedented floods of 2010 were the worst floods in history of the country in which about 1985 people lost their lives, 1,608,184 houses were damaged/ destroyed, 17,553 villages were affected and total area of 160,000 Km^2 was affected. The Sindh province, particularly southeastern parts of the province was severely affected due to unprecedented rains and inadequate drainage facilities during Monsoon Season-2011.

The torrential rains during 2012 rains/floods affected Southern Punjab, Sindh & Balochistan provinces. About 571 people lost their lives, 636,438 houses were damaged/ destroyed, 14,159 villages were affected and a total area of 4,746 Sq.km was affected. About 333 people lost their lives during 2013 rains/floods, around 8,297 villages with land area of around 4,483 Sq.km was affected. The floods of 2014, affected cropped area of about 2.415 million acres (9,779 square kilometers) affecting 4,065 villages, claiming about 367 lives, fully damaging 107,102 houses and population of about 2.600 million was affected. The floods 2015, affected more than 1.933 million populations, 4,634 villages (damaging 10,716 houses) and claiming about 238 lives all over the country.

Flood flows triggered by torrential rains affected various parts of country, especially Chitral valley in Khyber Pakhtunkhwa, Punjab, Balochistan and some parts of Sindh & Federally Administered Areas (Gilgit-Baltistan, FATA & AJK). Moderate to heavy downpour in upper catchments of major rivers and their tributaries generated flood flows, which caused losses to human lives and damages to private and public infrastructure. 2017-rains/ floods claiming 172 lives, injured 167 and damaged 440 houses.

1.9 INTEGRATED APPROACH IN FLOOD MANAGEMENT

Flood management plays important role in protecting people and their socio-economic activities in flood plains from flooding. The development in the river basins has been closely linked with successful implementation of flood control projects. In the past, exposure to flood risks has been handled largely through structural measures. However, strategies that rely largely on structural solutions unfortunately alter the natural environment of the river, which may result in loss of habitats, biological diversity and ecosystem productivity.

Further, structural approaches are bound to fail the moment an extraordinary or unforeseen event occurs. These traditional approaches, where the risks are merely transferred spatially, are likely to generate conflicts and inequities. Environmental degradation has the potential to threaten human security, including life and livelihoods, and food and health security. This realization has recently led to calls for a paradigm shift from traditional flood management to Integrated Flood Management.

Integrated Flood Management (IFM) is a concept that addresses issues of human security against flood risks and sustainable development within the framework of Integrated Water Resources Management (IWRM). Such an integrated approach to flood management can play an important role in sustainable development and poverty reduction. Integrated Flood Management aims at minimizing loss of life from flooding while maximizing the net benefits derived from flood plains.

1.10 FLOODS AND THE DEVELOPMENT PROCESS

Historically, flood plains have been the preferred places for socio-economic activity as is evident from the very high densities of human settlement found there. Floods are a natural phenomenon, with both negative and positive impacts, and, generally, should not be

considered a hindrance to economic development. Floods play a major role in replenishing wetlands, recharging groundwater and support agriculture and fisheries system, making flood plains preferred areas for human settlements and economic activities. Extreme demands on natural resources due to population growth have forced people and their property to move closer to rivers in many parts of the world. Further, flood control and protection measures have encouraged people to utilize newly protected areas extensively, thereby increasing flood risks and consequent losses.

Recurrent and extreme flooding, however, pose grave risks to development and have negative impacts on lives, livelihoods and economic activity and can cause occasional disasters. Flood disasters result from the interaction between extreme hydrological events and environmental, social and economic processes. These disasters have the potential to put development back by five to ten years, particularly in developing countries. The spiraling economic losses in developed countries also have given rise to grave concerns.

The balancing of development needs and risks is essential. The evidence worldwide is that people will not, and in certain circumstances, cannot abandon flood-prone areas. There is a need, therefore, to find ways of making life sustainable in the floodplains. The best approach is to manage floods in an integrated manner.

1.11 TRADITONAL FLOOD MANAGEMENT OPTIONS

The traditional management response to severe floods was typically an adhoc reaction – quick implementation of a project that considered both the problem and its solution to be self-evident, and that gave no thought to the consequences of flood risks for upstream and downstream areas. Thus, flood management practices have largely focused on mitigating floods intensity and reducing their localized damages to private and public property. Traditional flood management has employed both structural and non-structural interventions, besides, physical and institutional interventions. These interventions were employed prior, during and after flooding and have often overlapped. The traditional flood management interventions are listed below;

i. **Source control to reduce runoff:**

   Permeable pavements, a forestation artificial recharge;

ii. **Storage of runoff:**

   Detention Basins, reservoirs etc.;

iii. **Capacity enhancement of Headwork/Barrages across rivers:**

   Remodeling of Barrages/Headworks, provision of Bypass/Escape channels etc.;

iv. **Separation of rivers and populations:**

   Land-use control, flood plan mapping & zoning, removal of illegal encroachments, construction of flood protection infrastructure.

v. **Emergency management during floods:**

   Flood forecasting & warnings, flood fighting works i.e. raising/strengthening flood embankments, evacuation of flood affectees from dangers zone and their temporary settlement at safe places; and

vi. **Flood recovery:**
   Compensation of flood affectees and restoration of damaged public infrastructure.

Surface water storages (large, medium & small dams), flood embankments and flood flows retention basins, is a traditional approach to attenuating flood peaks. Water storage attenuate floods by slowing the rate of rising waters, by enhancing the time it takes for the waters to attain high level and evade the synchronization of flood peaks, hence, lowering the peak level in the downstream areas. Such storages reservoirs serve multiple purposes i.e. storage of water mainly for irrigation water supplies, hydropower generation including flood management. Storage Reservoirs have to be used in an appropriate combination with other structural and non-structural measures.

Seemingly self-evident, but regularly overlooked in practice, is the need to make flood management a part not only of the planning and design, but also of the operation of reservoirs. Releases of surplus water from reservoirs at the time, when rivers in the downstream areas experiencing high flood flows can create risks, therefore, careful operation of reservoirs can minimize the loss of human life and damages to property due to properly managed releases. In this context transboundary cooperation is indispensable.

Flood embankments are most likely to be appropriate for floodplains that are already intensely used, in the process of urbanization, or where the residual risks of intense floodplain use may be easier to handle than the risks in other areas i.e. (Landslides or other disturbances).

Land-use control is generally adopted where intensive development on a particular floodplain is undesirable. Providing incentives for development to be undertaken elsewhere may be more effective than simply trying to stop development on the floodplain. Where land is under development pressure, however, especially from informal development, land-use control is less likely to be effective. Flood protection or construction of houses at high elevation is most appropriate where development intensities are low and properties are scattered, or where the warnings times are short. In areas prone to frequent flooding, protection of the infrastructure and the communication links from floods can reduce the debilitating impacts of flood on the economy.

Flood Forecasting & issuance of timely warnings are complementary to all forms of intervention. A combination of timely, clear & accurate warning messages with a high level of community awareness gives the best level of preparedness for self-reliant action during floods. Public education Programme/awareness campaign is crucial to the success of warnings intended to preclude a hazard from turning into a disaster.

Evacuation is an essential constituent of emergency planning, and evacuation routes may be upward into a flood refuge at a higher elevation or outward, depending upon the local circumstances. Outward evacuations are generally necessary where the depths of water are significant, where flood velocities are high and where the buildings are vulnerable. Successful evacuations require planning and awareness among the population of what to do in a flood emergency.

Active community participation in the planning stage and regular exercises to assess the viability of the system help ensure that evacuations are effective. The provision of basic amenities such as water supply, sanitation and security in areas where affectees gather is particularly important in establishing a viable evacuation system.

1.12 THE CHALLENGES OF FLOOD MANAGEMENT

Besides many other challenges, climate change is emerging as perhaps the greatest environmental challenge for Pakistan causing floods, droughts and increasing hunger, poverty, displacement, soil degradation, desertification and deforestation. Rising number of extreme climate events, shift of monsoon rainfall zone from North-east to North-west. Intense, concentrated monsoon rains in short time of interval, inconsistent behaviour of monsoon and erratic flash flood events are the major future challenges. There is strong need to educate people about these natural disasters and their frequent occurrence in the region including Pakistan.

There is a growing recognition that current approaches regarding flood management are not as sustainable as they might be. Hence, it is imperative to cope with increasing risks of flooding and the uncertainties of climate change more effectively. Increased population pressure and enhanced economic activities in floodplains, such as the construction of buildings and infrastructure, further increase the risk of flooding. In developing countries with primarily agricultural economies, food security is synonymous with livelihood security. Floodplains contribute substantially to the food production that provides nutrition for the people of these countries.

Asia-Pacific region is under the very frequent and severe impacts of floods because of its geographical composition. Majority of the region's major cities are riverine or coastal, which have concentration of population, assets, economic & industrial development and infrastructures.

Flooding can be caused by torrential rains in urban areas, flash floods in semi mountainous regions, riverine flooding in main rivers in plain areas, or storm surge. In this respect, rapid urban growth brings us not only the prosperities but also a series challenge, in which the water-related issues, including the escalation of urban floods, have become essential problems in connection with sustainable development. The increasing urban flood risk has pushed all nations and international organizations to take measures to confront the threats caused by floods and to build flood resilient cities.

Pakistan is a resource constraint country with a fast growing population, low natural resource development based and unfavorable local socio-cultural conditions, and climate change is an additional stress for the country. Educating masses about natural disasters and building up their preparedness at educational institutions can be of great help to minimize the damages of disasters. Media can play its due role in this regard as without its support, awareness cannot be boosted. Areas vulnerable to climate change-induced natural disasters must have adequate flood protection facilities, besides, reliable medium and long range Weather & Flood Forecasting & Warning System in place.

1.13 IMPACT OF RAPID URBANIZATION ON FLOOD MANAGEMENT

According to 2017 Revision of the World Population Prospects of official United Nations population estimates and projections, in 2016, an estimated 54.5 per cent of the world's population lived in urban settlements. By 2030, urban areas are projected to house 60 per cent of people globally and one in every three people will live in cities. Between 2016 and 2030, the population in all city size classes is projected to increase, while the rural population is projected to decline slightly. While rural areas were home to more than 45 per cent of the world's population in 2016, that proportion is expected to fall to 40 per cent by 2030.

People move from rural environments into cities to seek economic opportunities and better access to basic services. Climate change is likely to accelerate the migration patterns into urban areas by altering the livelihood basis from both fishing and farming, and by increasing the occurrence and intensifying the effects of natural hazards. Land use and other human activities influence the peak discharge of floods by modifying how rainfall and snowmelt are stored on and run off the land surface into streams.

Construction of roads and buildings often involves removing vegetation, soil, and depressions from the land surface. The permeable soil is replaced by impermeable surfaces such as roads, roofs, parking lots, and sidewalks that absorb little water, reduce infiltration of water into the ground, and accelerate runoff to ditches and streams. With less storage capacity for water in urban basins and more rapid runoff, urban streams rise more quickly during storms and have higher peak discharge rates than do rural streams. In addition, the total volume of water discharged during a flood tends to be larger for urban streams than for rural streams.

1.14 CLIMATE VARIABILITY AND CHANGE

Pakistan is a small GHG emitter with total GHG emissions amount to 379 million tons of Carbon Dioxide (CO2) equivalent and is placed at 132nd place in the world ranking of countries on the basis of its per capita GHG emissions. Hence Pakistan's per capita emission of greenhouse gases is one of the lowest in the world. Yet according to report released by the German Watch Index, it is placed in an extremely vulnerable category (top ten vulnerable countries hit by climate change).

Highly visible changes can be marked in the intensity, variability and frequency of temperature, floods, droughts, cyclones and precipitation. This reveals that the hazards of climate change are increasing becoming visible day-by-day over Pakistan. North of Pakistan is the junction of three world's famous mountain ranges known as Himalayas, Karakoram and Hindukush, which possess third largest mass of ice after the Polar Regions.

While the country is influenced by three weather systems (Monsoon lows/ depressions from the Bay of Bengal, India, Westerly Waves from the Mediterranean Sea and Seasonal Lows from the Arabian Sea), studies under taken after 2010's historically unprecedented flood indicate a clear shift in the Monsoon pattern (from North-East to North-West about 100 Km, source; PMD) resulting into increased flood vulnerability to additional 25 districts (11 in Khyber Pakhtunkhwa and 14 in Punjab). Proven shift in monsoon trend from North East to North West has brought 25 additional districts to a higher degree of vulnerability to extreme rains, flash and riverine floods.

In Pakistan the average increase in temperature since 1950 is twofold as compared to the rest of the world. Blackening of glaciers clearly reflect high carbon deposition thus resulting into increased glacial melt. Glaciers' melting and heat absorption capacity thus increased manifold raising future concerns on GLOF events. The maximum snowfall has shifted to February and the duration is also narrowing down. Research has indicated that the Sea Surface Temperature of Arabian Sea is more than that of the Bay of Bengal. Occurrence of Yemyin Cyclone-2007, Phet cyclone-2010, Nelofer cyclone-2014 and Ashoba Cyclone-2015 is a clear manifestation of this research outcome. Additionally, Northern parts of the Country has recently witnessed incidents of GLOFs, with same major cities experiencing urban flood issues as well.

FEDERAL FLOOD COMMISSION

2. FEDERAL FLOOD COMMISSION

2.1 Historic Background

Prior to 1976, the Provincial Governments were responsible for the planning and execution of flood protection works. Disastrous floods of 1973& 1976 caused heavy loss of life and property and it was felt that the existing flood protection facilities and planning were inadequate to provide effective protective measures for the country. Heavy losses to the economy due to floods were discussed in the Inter-Provincial Conference held in January 1977 wherein it was decided to establish Federal Flood Commission (FFC) for integrated flood management on country wide-basis.

2.2 Functions of Federal Flood Commission

The existing charter of duties of FFC is given as under;

i. Preparation of Flood Protection Plan for the country including management of the Plan;
ii. Scrutiny of flood control/protection schemes funded by the federal government and prepared by Provincial Governments and Federal Agencies;
iii. Review of damage of flood protection works and review of plans for restoration and reconstruction works;
iv. Measures for improvement of Flood Forecasting & Warning System;
v. Preparation of a Research Programme for flood control and protection;
vi. Standardization of designs and specifications for flood protection works;
vii. Recommendations regarding principles of regulation of reservoirs for flood control;
viii. Evaluation and monitoring of progress of implementation of the National Flood Protection Plan;
ix. Federal Flood Commission may notify sub-committees as it deems appropriate.

Provincial governments and Federal Line Agencies undertake flood protection schemes proposed under the National Flood Protection Plans (NFPPs). The Federal Government, however, provides the resources for meeting the capital costs of projects under NFPPs.

2.3 Achievements of FFC

Since its establishment in 1977, FFC has so far executed three 10-Years National Flood Protection Plans covering periods from 1978-1988 (NFPP-I), 1988-1998 (NFPP-II) and 1998-2008 (NFPP-III). Brief details of projects are given as under:

National Flood Protection Plan-I (1978-88):

Details of flood protection schemes executed under **National Flood Protection Plan-I (NFPP-I)** through various Programme/projects are given as under;

Normal/ Emergent Flood Programme:

- Expenditure incurred: Rs 1,729.75 million
- No. of flood protection schemes completed in the four Provinces, AJ&K, FATA & NA (now G-B): 311
- Source of Funding: 100% by GOP

Under NFPP-I, emphasis was mainly given on the implementation of structural measures (construction of flood protection structures). Pakistan Meteorological Department (PMD) and WAPDA carried out only maintenance works related to Flood Forecasting & Warning System equipment.

National Flood Protection Plan-II (NFPP-II) (1988-98):

Details of flood protection schemes/activities carried out through various Programme/ projects are given as under;

Normal/ Emergent Flood Programme:

- Expenditure incurred — Rs 805.33 million
- No. of Schemes executed — 170
- Source of funding — 100% by GOP

Flood Protection Sector Project-I (FPSP-I):

- Expenditure incurred — Rs 4,735.29 million
- No. of flood protection schemes executed — 256
- Co-financed by GOP & ADB — ADB= 80%
GOP = 20%

Under NFPP-II, the following activities were undertaken for improvement of Country's existing Flood Forecasting & Warning System through Flood Sector Protection Project (FPSP-I), which was jointly funded by ADB and GOP.

- Procurement & installation of Meteor-burst Telecommunication System (Phase-I) including one Master Station and 24 remote sensing stations.
- Installation of 10-CM Quantitative Precipitation Measurement (QPM) Weather Radar at Flood Forecasting Division (FFD) Lahore.
- Pre-feasibilities studies for four Barrages i.e. Sulemanki, Baloki, Trimmu & Panjnad for increasing their design discharge capacity to carry increased flood flows in view of 1992 floods.
- Preparation of Flood Plain Maps of Indus River (5-Reaches i.e. Chashma-Taunsa, Taunsa-Guddu, Guddu-Sukkur, Sukkur-Kotri & Kotri-Seas Reach).

Prime Minister's River Management Programme 1994-1996

- Expenditure incurred — Rs. 613.386 million
- No. of schemes executed — 10
- Source of Funding — 100% by GOP

1988-Flood Damage Restoration Project

- Expenditure incurred — Rs. 1,874 million
- No. of structures restored — 2,028
- Source of Funding — 90% by IDA & ADB,

10% by GOP

1992-Flood Damage Restoration Project

- Expenditure incurred — Rs. 6,888.36 million
- No. of structures restored — 1,980
- Source of Funding — 80% by IDA, ADB & KfW
  20% by GOP

National Flood Protection Plan-III (NFPP-III) (1998-2008):

Details of flood protection schemes carried out through various Programme/projects are given as under;

Normal/Emergent Flood Programme:

- Expenditure incurred — Rs 4,192.35 million
- No. of flood protection schemes executed in four Provinces, AJ&K, FATA, ICT and Northern Areas (Now Gilgit-Baltistan) — 362
- Source of Funding — 100% by GOP

Special Grant through President/Chief Executive Directive (2000-2002)

- Expenditure incurred — Rs. 92.00 million
- No. of schemes executed — 21
- Source of Funding — 100% by GOP

Flood Protection Sector Project-II (FPSP-II):

- Expenditure incurred — Rs 4,165 million
- No. of Flood Protection Schemes executed — 101
- Source of Funding — 80% by ADB,
  20% by GOP
- Flood Forecasting & Warning System — Rs 432.123 million

The major activities undertaken for improvement and upgradation of country's existing Flood Forecasting & Warning System include;

- Procurement & installation of 24 No. HF-Radio Sets.
- Procurement & installation of 20 additional remote sensing stations under existing Meteor-burst Telecommunication System (Phase-II);
- Upgradation of 10 CM Quantitative Precipitation Measurement Weather Radar procured under FPSP-I in the premises of FFD, Lahore;

- Upgradation of 5.36 CM Sialkot Weather Radar into 10 CM Quantitative Precipitation Measurement Weather Radar;

- Procurement & installation of a 10 CM Quantitative Precipitation Measurement Weather Radar at Mangla;

- Development of initial/1st version of Computer Based Flood Early Warning System (FEWS) through NESPAK, PMD & Delft Hydraulics;

- Expansion of Flood Plain Mapping activity covering major tributaries of River Indus i.e. Rivers Jhelum, Chenab, Ravi & Sutlej.

- Bathymetric Survey & flow measurements of Indus River and its major tributaries *(Sutlej, Ravi, Chenab & Jhelum)* for improvements in discharge rating curves & to collect data for FEWS Model & Flood Plain Mapping activities.

Establishment of Flood Forecasting & Warning System for Lai Nullah Basin (Islamabad &Rawalpindi):

- Expenditure incurred: Rs 348 million
- Source of Funding;
  - *Japanese Grand –in-Aid* Rs 337 million
  - *GOP share* Rs 11.00 million
- Facilities provided include:

  - Two No. Telemetry rainfall gauging stations at Golra, Islamabad and Bokra, Islamabad;
  - Two No. water level gauging stations at Kattarian Bridge, Rawalpindi and Gawalmandi Bridge, Rawalpindi;
  - Master control station in PMD, Islamabad;
  - Two monitoring stations at FFC and TMA/Rescue-1122-Rawalpindi respectively;
  - Executive Warning Control room in Rawalpindi Fire Brigade, and
  - Nine (9) No. warning posts at various locations.

2.4 National Flood Protection Plan -IV

National Flood Protection Plan-IV (NFPP-IV) could not be started due to drought like condition in the country during the period 2000 to 2009. However, floods of 2010 followed by subsequent flood events during 2011 & 2012 warranted for preparation of NFPP-IV. NFPP-IV was prepared by Consultants (M/S NESPAK & Deltares) during the period of 2 years (2013-2015) through World Bank funded project (WCAP) with extensive consultation with provinces, Federal Line Agencies & other stakeholders. National Flood Protection Plan-IV (NFPP-IV) (finalized draft Version) remained under an extensive deliberation process during the four (4) meetings of the Council of Common Interest (CCI) held on 29.02.2016, 25.03.2016 & 16.12.2016 and **finally approved** by CCI in its 31st meeting held on 02.05.2017.

CCI decided that financing of the NFPP-IV would be made by the federal and provincial governments @ 50:50 and the provinces will decide their respective share of contribution among themselves and report to the federal government. NFPP-IV is bifurcated in two phases i.e. Priority-I works costing Rs. 177.661 billion planned to be executed in first 5

years whereas the additional works costing Rs. 154.585 billion recommended by PIDs and FLAs would be undertaken as Phase-II during the next 5 years.

The draft Umbrella PC-I for implementation of NFPP-IV prepared by the Consultants was considered by the Scrutinizing Committee (S.C) of FFC in its meeting held on 15th December 2017. The amended Umbrella PC-I (received from consultants) has been circulated among the provinces in last week of February 2018 for getting its clearance from their respective PDWP. Thereafter, it would be submitted to Ministry of Planning Development & Reforms through Ministry of Water Resources for consideration/approval of the CDWP/ECNEC.

The Concept Clearance Paper titled "Implementation of National Flood Protection Plan – IV (10-Year Plan)" has also been prepared on the basis of guidelines of Planning Commission and submitted to Ministry of Water Resources in last week of February 2018 for onward transmission to Planning Commission for approval by CDWP. Economic Affairs Division (EAD) would be approached for seeking external donors financing for implementation of sub-projects provided in the umbrella PC-I as soon as the Concept Clearance Paper is approved by CDWP.

Presently, the urgent nature flood protection works being proposed by the Provincial Irrigation Departments and Federal Line Agencies are executed through GOP funded Normal/Emergent Flood Programme. However, due to inadequate budget allocation under PSDP each year *(minimal as compared to the Provinces & Federal Line Agencies demands)* for Normal/Emergent Flood Programme, some urgent nature flood protection schemes remain un-attended. The budget demand by the Provinces and Federal Line Agencies, budget allocated and actually released during the past eight (8) years to PIDs & Federal Line Agencies is given in **Table-3**.

TABLE-3

BUDGET DEMAND BY THE PROVINCES & FEDERAL LINE AGENCIES, BUDGET ALLOCATED & RELEASED DURING PAST YEARS

(Rs. Million)

Sr. No.	Financial Year	Funds demanded	Budget Allocation under PSDP		Funds Released
			Original	Revised	
1	2009-10	3,500.000	1,000.000	575.110	78.358
2	2010-11	3,500.000	740.798	735.798	276.714
3	2011-12	4,000.000	894.000	844.194	567.095
4	2012-13	4,000.000	900.000	900.000	419.325
5	2013-14	4,500.000	1,000.000	1,000.000	855.533
6	2014-15	5,000.000	1,000.000	1,000.000	898.477
7	2015-16	5,000.000	1,000.000	964.430	964.430
8	**2016-17**	5515.00	500.00	500.00	267.500
	Total	**35,015.000**	**7,034.798**	**6519.532**	**4327.432**

2.5 Normal/Emergent Flood Programme (2016-17)

Since creation in 1977, Federal Flood Commission is coordinating implementation urgent nature flood works through Normal/Emergent Flood Programme. It is a yearly based Programme. Provincial Irrigation Departments and Federal Line Agencies submit their schemes (based on their shares) each year, which are processed by FFC for technical clearance of Scrutinizing Committee of FFC and approval of DDWP/CDWP. The award of contract, execution and disbursement is the exclusive responsibility of Provincial Irrigation Departments and Federal Line Agencies.

The flood protection schemes are processed for approval and implementation before 30th June each year subject to in-time approval and release of funds by Planning Commission/Finance Division to the Line Agencies. An amount of Rs. 1000.00 million was allocated under PSDP (2015-16) for Normal/ Emergent Flood Programme, against that Rs 964.430 million were released to PIDs & FLAs. Similarly, an amount of Rs. 500.00 million was allocated under PSDP (2016-17) for Normal/ Emergent Flood Programme against which Rs 267.500 Million were released. Detailed list of schemes executed/ being executed under Normal/ Emergent Flood Programme during Financial Years (2015-16) & (2016-17) is attached as **Appendix-I.**

2.6 Summary of investment on Flood Projects through GOP grants/ Foreign Aid:

The summary of investment on flood projects through GOP grants & foreign aids coordinated by FFC since 1978-79 to June 2016 is narrated in **Table-4** given on the next page.

TABLE-4

SUMMARY OF FEDERAL INVESTMENT ON FLOOD PROTECTION WORKS

Sr. No.	Flood Plans/ Programs	Location	No. of schemes	Expenditure (Rs Million)
1.	**NFPP-I (1978-88)**			
	Normal Annual Development Programme GOP funded	Countrywide	311	1,730
		Sub-Total (1)	**311**	**1,730**
2.	**NFPP-II (1988-98)**			
i.	Normal/Emergent Flood Programme	Countrywide	170	805
ii.	First Flood Protection Sector Project (FPSP-I) Co-financed by GOP & ADB	Four Provinces	256	4,735
iii.	Prime Minister's River Management Programme (1994-96)	Punjab, Khyber Pakhtunkhwa & Balochistan	10	613
		Sub-Total (2)	**436**	**6,153**
3.	**NFPP-III (1998-2008)**			
i.	Normal/Emergent Flood Programme	Countrywide	362	4,192
ii.	Second Flood Protection Sector Project FPSP-II (1998-2007) Co-financed by GOP & ADB	Four Provinces	101	4,165
iii.	Special package executed through directives of President/Chief Executive (2000-02)	Gilgit-Baltistan	21	92
iv.	Lai Nullah Flood Forecasting & Warning System through JICA grant-in-aid	District Rawalpindi & ICT	1	348
		Sub-Total (3)	**485**	**8,797**
4.	**Normal/Emergent Flood Programme**			
	Normal/Emergent Flood Programme (2008-09 to 2016-17)	All over the country	272	5,143
		Sub-Total (4)	**272**	**5,143**
5.	**Flood Damage Restoration Projects**			
i.	1988-Flood Damage Restoration Project	Four Provinces	2,028	1,874
ii.	1992-Flood Damage Restoration Project	Countrywide	1,980	6,888
		Sub Total (5)	**4,008**	**8,762**
		Grand Total (1, 2, 3, 4 & 5)	**5,512**	**30,585**

FLOOD MANAGEMENT MECHANISM

3. FLOOD MANAGEMENT MECHANISM

3.1 Major organizations involved in flood management and their responsibilities

Flood management is a multifunctional process involving a number of organizations. The government organizations, which play major role in the flood management, are the Provincial Irrigation Departments (PIDs), GB-PWD, Irrigation Directorate FATA, Irrigation & Small Dams Organization, Government of AJ&K, PMD/Flood Forecasting Division, Lahore WAPDA, PCIW, Federal Flood Commission, NDMA, Provincial Relief Organizations, Pak Army, NHA, Pakistan Railways, Provincial Disaster Management Authorities, GB-DMA, FDMA, SDMA & DDMAs/District Administration. Functions of these organizations are briefly described hereinafter;

3.1.1 Provincial Irrigation Departments:

The Provincial Irrigation Departments (PIDs) play a front line role in flood management, fighting and mitigation. Major flood related functions include:

i. Operation and maintenance of Barrages, Irrigation & Drainage Networks, including flood protection structures, besides, measurement of discharges at control points (Barrages/Headworks) across main rivers,

ii. Planning, design, construction of new Irrigation, Drainage & Flood Protection/ River Training projects;

iii. Collection and transmission of Rivers flows data to FFD, Lahore, FFC and other concerned organizations for taking further action at their end;

iv. Establishment & Operation of Flood Warning Centre during the monsoon season each year for sharing flood flows data and other information, besides, timely dissemination of the flood forecasts/warnings to concerned quarters;

v. Preparation & implementation of the Flood Fighting Plans during monsoon season every year.

3.1.2 WAPDA

WAPDA is actively involved in the flood forecasting process as it provides water levels of major reservoirs (Tarbela, Chashma & Mangla), river flows and rainfall data collected through Flood Telemetric System/Gauged sites in the catchment areas of major rivers. The system is supplemented by Meteor-burst communication system. WAPDA supports another hydrometric data measurement and transmission system through its Surface Water Hydrology Project.

WAPDA's Flood Telemetric Network is directly linked with FFD, Lahore. WAPDA provides hydrometric flood data and water levels, inflows/ outflows of Tarbela, Chashma and Mangla reservoirs to FFD, Lahore, FFC and other concerned organizations. Coordination between FFD Lahore and WAPDA has considerably improved after the 1992-flood disaster. Regular meetings in the office of General Manager (Planning & Design) are held during flood season and necessary instructions are issued to Tarbela and Mangla Dam Flood Management Committees.

Flood control is among the general powers and duties of the Authority given in WAPDA Act 1958. The same are outlined as under:

(1) The Authority shall prepare, for the approval *of* the Government a comprehensive plan for the development and Utilization of the Water and Power resources of Pakistan on a unified and multi-purpose basis;
(2) the Authority may frame a scheme or schemes for a Province or any part thereof providing for all or any of the following matters, namely

i. Irrigation, water supply and drainage; and recreational- use of water resources.
ii. The generation, transmission and distribution of power, and the construction, maintenance and operation of power houses and grids.
iii. Flood control.
iv. The prevention of waterlogged and reclamation of waterlogged and salted lands.
v. Inland navigation.
vi. The prevention of any ill-effects on public health resulting from the operations of the Authority and
vii. "Privatize or otherwise restructure any operation of the Authority except the hydel generating power stations *(and the National Transmission Grid - omitted)".

3.1.3 Provincial Disaster Management Authorities:

Ultimate aim of flood warnings is to reduce the loss of life and damages to property of the community living in the flood prone/high risk areas. Provincial Disaster Management Authorities are responsible for disaster preparedness, preparation of emergency response plan, rescue and relief measures and rehabilitation plan and its approval from Provincial Government before implementation; examine the vulnerability of various parts of the province to different disasters and specify prevention or mitigation measures; lay down guidelines for preparation of disaster management plans by the Provincial Department and District Authorities; evaluate preparedness at governmental levels to respond to disaster and enhance preparedness; coordinate response in the event of disaster; give directions to DDMAs regarding actions to be taken in response to disaster; and promote general education, awareness and community training etc. pertaining to all disasters including floods.

Relief functions at the District and Tehsil/Union Council level are now performed through the District Disaster Management Authorities, who coordinate with the concerned departments to carry out the disaster management functions at the District level.

3.1.4 Pak Army:

Pak Army's Corps of Engineers under the command and control of Engineer-in-Chief *(E-N-C)* provide necessary help to the civil authorities to carry out rescue and relief operations during floods. Provincial Governments facilitate Pak Army in providing necessary logistic support/equipment (boats, life jackets, vehicles, tents etc.) for such operations.

Pakistan Army's flood related functions encompass all the three phases of flood operations from the pre-flood to post flood phases including the important flood phase. Pre-flood phase is the flood preparatory phase during which the adequacy and serviceability of the flood fighting equipment is ensured. Pre-flood meetings are also held at the Corps Head

Quarters and Engineer Directorate, GHQ in order to review the arrangements of PIDs, PDMAs & Federal Line Agencies for handling flood situation.

Pre-flood inspections of the flood protection structures are carried out by the respective Commander Corps of Engineers alongwith concerned field formations of Provincial Irrigation Departments for their respective areas to ensure that the flood protection structures (Bunds, Barrages, Spurs etc.) are in satisfactory state of maintenance. Deficiencies, if any, are brought into the notice of PIDs. Availability of flood fighting material and sufficient stock of explosives is ensured at pre-determined breaching sections to activate the pre-determined breaching sections, whenever required.

An officer of the 4 Corps Engineers is placed on duty in the Flood Warning Centre, Lahore, to keep a close watch on the flood situation. All flood forecasts and warnings are communicated to the CC Engineers 4 Corps in time, which are transmitted to the D.G. Engineers and all other CC of the Engineers. In the event of floods, units of the Pak Army move out to their respective areas of responsibility and carry out the relief and rescue operations in coordination with the respective civil administration.

Besides above, a post flood coordination meeting is held under the Chairmanship of Engineer-in-Chief/D.G. Engineers to discuss the performance of all flood management related agencies with the view to bring about the necessary improvements in future.

3.1.5 Pakistan Commissioner for Indus Waters (PCIW)

Pakistan has a unique flood-forecasting problem in the sense that major part of the flood generating in upper catchments of Rivers Sutlej, Ravi, Jhelum and Chenab lie across the border in India/ held Kashmir. A number of water storage reservoirs have been constructed over Eastern Rivers (Ravi & Sutlej) across the border. As a result, the free flood flow conditions are disrupted making the operation of the rainfall/runoff model extremely difficult. The situation underlines the need for the acquisition of rivers flow data from across the border in respect of important sites over the rivers in India/held Kashmir.

Consequently, an agreement had been signed between the two countries in 1989 through their respective Commissioners for Indus Waters, which includes provision/ sharing rivers flows data with India such rivers flow and rain data as is considered important for flood forecasting in Pakistan. A number of river flow stations are specified for this purpose.

The Pakistan Commissioner for Indus Waters receives the Chenab River and Eastern Rivers (Ravi & Sutlej) data normally once in a day. The data is then passed on to the FFD, Lahore for preparation and issuance of flood forecast to concerned organizations. Frequency of data reception is increased to six hourly and even to hourly in case of severe flood situation.

Pakistan Commissioner for Indus Waters is thus responsible to provide to FFD, Lahore, the much-needed data obtained from India for use in the flood forecasting models to ensure accurate forecasts for Rivers Sutlej, Ravi, Jhelum & Chenab. Pakistan Commissioner for Indus Waters is the only forum through which any clarification or further information can be obtained from India with regard to flood flows data of Chenab & Eastern River (Ravi & Sutlej).

3.1.6 Role of Federal Flood Commission in Flood Management/Mitigation

Pre-Monsoon Season action taken by FFC

- FFC chalks out pre-emptive measures for better flood management during monsoon season, which are circulated amongst all stakeholders for taking further action at their end.

- For that purpose, preparatory meeting of Federal Flood Commission was held on **28.03.2017** under the Chairmanship of Chief Engineering Advisor/ Chairman Federal Flood Commission in the Committee Room of office of CEA/CFFC in order to review the progress on post 2016 floods activities and preparatory works for monsoon season 2017. Necessary pre-emptive measures were issued to concerned organizations.

- The 5th quarterly meeting of Federal Flood Commission was organized on **10.05.2017** under the Chairmanship of Ms. Marvi Memon, Representative of Honourable Supreme Court of Pakistan to review the status of compliance of directions given by the Honourable Supreme Court of Pakistan on the recommendations of Flood Inquiry Commission.

- Another meeting to review the priority projects/ activities which were likely to be carried out during 1st year of implementation of NFPP-IV, besides, progress made on the decisions of 1st pre monsoon season 2017 meeting of FFC held on 28th March 2017 was held on 1st June 2017.

During Monsoon Season Role of FFC:

- FFC issued Daily Flood Situation Report to higher ups and Flood Management related agencies, based on Weather Forecasts/ Advisories and Rainfall & Rivers flow data as received from FFD, Lahore/PMD, WAPDA & PIDs. For that purpose, Flood Communication Cell established in FFC worked on round-the-clock basis during entire Monsoon Season (15th June to 15th October, 2016). Responsibility for response/ reaction to warnings issued by PMD/FFD, Lahore & FFC rests upon concerned Provincial organizations/District Administrations.

- The 52nd Annual meeting of FFC under the Chairmanship of Federal Minister for Water & Power (now Water Resources) was organized on **11.07.2017**, which was attended by all stakeholders for presenting their status of preparedness. Necessary directions were issued to concerned organizations for assuring the safe passage of flood flows during monsoon season 2017.

- A meeting of FFC to review the Existing SOPs of Tarbela Dam Project was held on **20.07.2017** under the Chairmanship of Chief Engineering Advisor/ Chairman Federal Flood Commission in the Committee Room of office of CEA/CFFC, for assuring the safe passage of flood flows during monsoon season 2017.

- A special meeting of FFC related to various issues pending with PID & FLAs was held on **21.07.2017** under the Chairmanship of Chief Engineering Advisor/ Chairman Federal Flood Commission in the Committee Room of office of CEA/CFFC and various instructions were conveyed to all concerned organizations.

Post Monsoon Season Role of FFC

- FFC reviewed the list of flood protection schemes in consultation with Provincial Irrigation Departments and Federal Line agencies and re-prioritized in light of allocated budget under PSDP (2017-18) for execution of urgent nature flood protection schemes through Normal/Emergent Flood Programme;

- FFC technically scrutinizes the PC-Is of flood projects through S.C of FFC and submit to Ministry of Water Resources for approval of DDWP/CDWP. Total eight meetings of Scrutinizing Committee of FFC were organized, wherein 35 number flood protection schemes were technically examined and recommended to Ministry of Water & Power for approval of DDWP/CDWP.

- Four meetings were organized for review of progress on implementation of flood projects under GOP funded Normal/Emergent Flood Programme.

- The sites inspections of flood protection schemes being executed under Normal/Emergent Flood Programme were carried out by the FFC's Monitoring Teams.

- Post Flood meeting of Federal Flood Commission was held on **22.11.2017** in the committee room of office of Chief Engineering Advisor/Chairman Federal Flood Commission, Islamabad under the Chairmanship of Chief Engineering Advisor/ Chairman FFC, Islamabad in order to review the damages caused to irrigation, drainage and flood protection infrastructure during monsoon season 2017.

- The 6th quarterly meeting of Federal Flood Commission was organized on **05.12.2017** under the Chairmanship of Ms. Marvi Memon, Representative of Honourable Supreme Court of Pakistan to review the status of compliance of directions given by the Honourable Supreme Court of Pakistan on the recommendations of Flood Inquiry Commission.

3.1.7 Flood Forecasting Division (FFD), Lahore

FFD, Lahore, the specialized unit of Pakistan Meteorological Department, plays a pivotal role in the Flood Forecasting & issuance of Warnings to concerned quarters. It obtains hydro-meteorological data from the various National and International sources, which is then analyzed to produce weather /flood forecasts & warnings and disseminated to various Federal/Provincial organizations and electronic/print media through various means and also uploaded on PMD Website.

3.1.8 National Disaster Management Authority (NDMA)

Government of Pakistan had embarked upon establishing appropriate policy to minimize risks and vulnerabilities and passed NDMA ordinance 2006. National Disaster Management Authority (NDMA) serves as focal point and coordinating body to facilitate implementation of disaster risk management strategies. This necessitates NDMA to directly interact/communicate with all stakeholders, including Ministries, Divisions, and Departments in relaxation to normal communication channel.

NDMA is an expedient to provide an effective national disaster management system and for matters connected therewith and incidental thereto. As per National Disaster Management Authority Act-2010, the main functions of NDMA are as under:

i. Act as implementing, coordinating and monitoring body for disaster management;

ii. Prepare the National Plan to be approved by the National Disaster Management Commission;

iii. Implement, coordinate and monitor the implementation of the national policy;

iv. Lay down guidelines for preparing Disaster Management Plans by different ministries or departments and the provincial authorities;

v. Provide necessary technical assistance to provincial government and provincial authorities for preparing their Disaster Management Plans in accordance with the guidelines laid down by the National Disaster Management Commission;

vi. Coordinate response in the event of any threatening disaster situation or disaster;

vii. Lay down guidelines for the concerned ministries or provincial governments and provincial authorities regarding measures to be taken by them to response to any threatening disaster situation or disaster;

viii. For any specific purpose or for general assistance requisition the services of any person and such person shall be co-opted as member and exercise such power as conferred upon him by the authority in writing;

ix. Promote general education and awareness in relation to disaster management;

x. Perform such other functions as the National Disaster Management Commission may require performing.

3.2 Flood Warning Dissemination System:

Monsoon Season normally starts in 1st week of July (s*ometimes, it starts little early)* and ends in last week of September *(sometimes prolongs up to mid-October)*. However, the Flood Warning Centers of all flood management related agencies start functioning from 15th June every year for collecting weather & flood flows data and keep continue upto 15th October. During this period, effective interaction and communication between various floods related provincial as well as federal agencies is maintained on round-the-clock basis in order to counter any eventuality due to monsoon rains/floods.

PREPAREDNESS/ CONTINGENCY PLANNING FOR MONSOON SEASON 2017

4. PREPAREDNESS & CONTINGENCY PLANNING BY FEDERAL FLOOD COMMISSION FOR MONSOON SEASON 2017

FFC mainly plays coordination role among Provincial and Federal Government Organizations dealing with flood management in the country for avoiding loss of life and minimizing damages to agricultural lands and other public and private property. However, managing the flood water is the sole responsibility of provincial Irrigation Department, and Federal Line Agencies.

As per practice, FFC holds meetings prior to start of Monsoon Season (1st July to 15th October) every year, to review the status of preparedness/ flood fighting arrangements made by Federal/Provincial Organizations for upcoming Monsoon season.

4.1 Preparatory Meeting of Federal Flood Commission

FFC chalks out pre-emptive measures for better flood management during monsoon season each year, which are circulated amongst all stakeholders for taking further action at their end. For that purpose, first preparatory meeting of Federal Flood Commission was held on March 28, 2017 under the Chairmanship of Chief Engineering Advisor/ Chairman Federal Flood Commission in the Committee Room of office of CEA/CFFC in order to review the progress on post 2016 floods activities and preparatory works for monsoon season 2017. The following directions were issued to PIDs/Federal Line Agencies, WAPDA, PMD & other concerned agencies etc.;

i. **Provincial Irrigation Departments & Federal Line Agencies** will vigorously follow up their cases regarding pending approval of new flood protection schemes & release of funds under Normal/ Emergent Flood Program of PSDP (2016-17) so as to accelerate the pace of implementation in order to complete all new/ongoing flood protection schemes before the start of upcoming monsoon season 2017.

ii. **Provincial Irrigation Departments & Federal Line Agencies** will ensure to carry out pre-flood monitoring of flood protection infrastructure *(flood bunds, spurs, Barrages/Head Works and allied works etc.)* alongwith concerned Corps of Engineers of Pak Army and ensure strengthening of all weak sections of bunds/spurs etc. well before the start of Monsoon Season 2017 **(by/before 15th June 2017)**.

iii. **Provincial Irrigation Departments & Federal Line Agencies** will ensure completion of strengthening work of all critical points/weak sections of flood protection infrastructure (flood bunds, spurs, Barrages/Head Works and allied works etc.) including flood damages restoration works related to Irrigation, Drainage & Flood Protection Infrastructure by/before **15th June 2017**. The compliance report would be submitted to FFC soon after completion of the task.

iv. **Provincial Irrigation Departments & Federal Line Agencies** will finalize District/ Division-wise Flood Fighting Plans, keeping in mind lessons learnt during the past consecutive flood events and ensure their circulation among concerned organizations **by/before 15th June 2017**.

v. **PID Punjab including NHA, Pak Railways** will ensure arrangements of explosive and others material at sites of pre-determined breaching sections and stone reserve stock/ flood fighting material to be arranged at all critical reaches of flood

embankments as identified during pre-flood inspections before start of monsoon season 2017 **(before 15th June 2017).**

vi. **PID, Punjab** will ensure completion of strengthening works of "Minchin Flood Bund", "Mashko Flood Bund" & Jhelum Flood Protection Bund through Provincial resources well before the start of monsoon season 2017.

vii. **PID, Punjab** {Chief Engineer (Irrigation), Lahore Zone} to expedite action regarding preparation of a comprehensive & implementable/feasible project proposal (socially, environmentally & politically acceptable proposal) in consultation with all concerned organizations including concerned Corps of Engineers of Pak Army regarding the long outstanding issue of "*Enhancing the discharge capacity of Shahdara Railway Bridge across River Ravi*". Thereafter, the PC-I may be prepared by PID Punjab in consultation with all concerned organizations and process the same on priority basis for approval and funding arrangements. Meanwhile, all necessary short term/ pre-emptive measures may also be taken by PID Punjab on war footing basis for safe passage of flood flows during the monsoon season 2017.

viii. **PID, Sindh** to ensure completion of ongoing project i.e. "Construction of flood protective bund around Kashmore Cantt. Mile O/o to 5/5+300" being funded through Provincial resources before start of monsoon season 2017.

ix. **Engineers Directorate, GHQ Rawalpindi** to determine the feasibility of the project proposal titled "Protection of Kashmore Garrison and adjoining area from flood flows of Shori nullah, in Punjab province" in the light of above-stated view point of PID, Punjab.

x. **Provincial Irrigation Departments & Federal Line Agencies** will ensure to expedite the ongoing process of removal of encroachments from flood Protection infrastructure and flood plains before start of Monsoon Season 2017 **(by/before 15th June 2017).** The updated compliance report may be submitted to SUPARCO without further delay under intimation of FFC, which would be reviewed during the next quarterly progress review meeting of FFC, likely to be organized shortly.

xi. **PIDs, FLAs** including **NDMA /PDMAs/ GB-DMA/ FDMA/ SDMA to** prepare their Contingency Plans for monsoon season 2017 and share hard as well as soft copies with all concerned organizations including FFC for uploading on its website.

xii. **Chief Engineering Advisor/Chairman, Federal Flood Commission** will write DO letter to Chairman WAPDA for early release of funds (Rs 16.630 million) required for repair of 24 damaged flood telemetric stations of WAPDA before the start of upcoming monsoon season 2017.

xiii. **WAPDA** will organize an exclusive meeting with IRSA and all other concerned agencies in order to finalize the draft revised SOPs of Tarbela Dam Project, ensuring enhancement of its role in flood mitigation. The task (preparation of SOPs and their approval from Ministry of Water & Power) would be completed before start of monsoon season (i.e. **30th June 2017)**.

xiv. **WAPDA** will sign a formal written agreement with Pak Army/Mangla Garrison regarding their consent for shifting of installations/buildings etc. to safer places for

passage of at least 20,000 cusecs through Barakas nullah as immediate short term measure, for operation of Emergency Spillway of the reservoir in case of occurrence of Probable Maximum Flood.

xv. **NHA & Pak Railways** will also prepare their Contingency Plans for monsoon season 2017 and share hard as well as soft copies of the same with FFC for uploading on its website.

xvi. **PMD, FFD, Lahore & WAPDA** will ensure completion of all essential repair/ maintenance works of Flood Forecasting and Warning System equipment and ensure that the System /Radars Network is fully functional **by/before 15th June 2017**.

xvii. **PCIW** will expedite the follow up actions in the light of decisions of their recent dialogues with ICIW held in Islamabad, for obtaining discharges of Eastern Rivers and Chenab River flood flow data at Salal HEP, 56 KM upstream of Akhnoor bridge across Chenab River, besides inflows & levels of reservoirs across Eastern rivers i.e. Bhakra, Pong & Thein Dam Projects and its transmission to end users (FFC, PMD/FFD, Lahore, WAPDA, NDMA & PDMAs etc.) during monsoon season 2017.

xviii. **Provincial Irrigation Departments & Federal Line Agencies** will ensure submission of all necessary flood information/ rivers flow data to all concerned agencies including FFC & FFD, Lahore, regularly on daily basis, during the entire monsoon season 2017.

xix. **NDMA** to ensure timely completion of ongoing rationalization of demands of Pak Army regarding rescue & relief equipment, besides that the rationalized demands of concerned Corps of Engineers have been met by PDMA-Punjab, PDMA-Sindh & PDMA-KP by/before **30th June 2017** for smooth relief & rescue operations during the monsoon season 2017.

xx. **NDMA** in consultation with Pak Army, PDMAs and DDMAs will ensure completion of all necessary arrangements regarding rescue and relief activities to be carried out during the flood emergency in the coming monsoon season 2017.

xxi. **Deputy Commissioner, Rawalpindi** will expedite completion of ongoing demarcation activity regarding right of way of Lai Nullah and ensure removal of encroachments from the bed & banks of Lai Nullah before start of monsoon season 2017 **(15th June 2017).**

xxii. **WASA Rawalpindi** will ensure completion of dredging/de-silting work of Lai Nullah well before the start of monsoon season 2017 so as to ensure smooth passage of flood flows during monsoon season 2017.

4.2 Quarterly meeting of FFC held on 10.05.2017 to review status of compliance of directions given by the Honourable Supreme Court of Pakistan on the recommendations of Flood Inquiry Commission.

The 5th quarterly meeting of Federal Flood Commission was organized on 10th May 2017 to review the status of compliance of directions given by the Honourable Supreme Court of Pakistan related to Constitution Petition No. 62 of 2010, filed by Ms Marvi Memon

versus Federation of Pakistan, through Secretary Cabinet & others. Following decisions were taken related to flood preparedness of the four Provincial Irrigation Departments and Federal Line Agencies, WAPDA & PMD etc.:

i. Chief Engineering Advisor/ Chairman, FFC would write D.O Letter to Chief Ministers of the provinces and federally Administered areas asking thereby;

   (a) To direct the Head of concerned organizations to either attend the FFC's future meetings themselves or depute senior level officers of BS-20 or above well versant with subject matter so that their participation is meaningful.
   (b) The coordination among concerned organizations may be further improved
   (c) Action on all pending issues may be accelerated so as to complete the task at the earliest and compliance report is submitted to Honourable Supreme Court through Ministry of Water & Power.

ii. CEA/CFFC would write Letter to Chief Secretaries Government of Balochistan, AJK and Gilgit Baltistan asking for ensuring senior level representation from Irrigation Department, Govt of Balochistan, Irrigation Department, Govt of AJK and Secretary (Works) Gilgit Baltistan in FFC's future meetings.

iii. PIDs of the four provinces, GB-PWD & Irrigation and Small Dams organization, Government of AJK to submit to SUPARCO within weeks' time complete list of encroachments in flood plains, waterways and settled over irrigation, drainage & flood protection structures alongwith requisite like site plans/maps showing flood protection structures with complete name, location and RD of encroachment with start point/end point information besides details of encroachments.

iv. PIDs & FLAs would depute GIS Expert of their Departments to coordinate and facilitate SUPARCO during process of verification.

v. Irrigation Directorate FATA Secretariat to submit to FFC certificate duly signed by Additional Chief Secretary, FATA that there were no encroachment issues in flood plains, waterways of rivers and hill torrents flowing in FATA, besides, encroachments over irrigation, drainage & flood protection infrastructure.

vi. SUPARCO to carry out verification exercise in respect of information being submitted by PIDs & FLAs.

vii. SUPARCO to assess the budget required for identification of encroachments in flood plains & waterways of major & other rivers and submit the same to FFC for taking further action in the matter.

viii. WAPDA Authority to consider and approve full funding from WAPDA Resources (Hydroelectric Income) for Annual Recurring Expenditure (Rs 130.39 million) and special demand of Rs 16.61 million for rehabilitation/Restoration of damaged/out of order Flood Hydro Met Telemetry Stations and smooth & trouble free function of the Hydro Meteorological Telemetry Network as per decision taken Ministry's meeting held on 15th November 2016.

ix. H&WM Wing of WAPDA to ensure the restoration work of 24 damaged Flood Telemetry Stations was completed well before start of next monsoon season.

x. Meanwhile, work on upgradation of entire Flood Telemetry Network through WCAP may also be pursued with PMPIU on priority basis, so as to complete the job at the earliest. The progress may be shared with FFC till completion of the job.

xi. Pakistan Metrological Department/FFD, Lahore to continue pursuing its case with Planning Commission and other concerned organizations (Economic Affairs Division) for approval and arrangement of funds through external donor agencies for expansion of its Radar network and establishment of other flood forecasting and early warning systems in the country. The progress on the case will be shared with FFC on regular basis.

xii. PIDs and FLAs (Irrigation Directorate FATA, GB-PWD & Irrigation Department AJK) including Watershed management authorities of Mangle & Tarbela Dams Projects, to keep close liaison with their respective Forest Departments for watershed management/ forestation promoting activities in the catchment areas of rivers/hill torrents in order to check land sliding and excessive bed erosion, which would minimize flood damages.

xiii. The Forest Departments of the four provinces and concerned federal line agencies would also submit the updated status report to FFC on regular basis.

xiv. PID Punjab to coordinate with Project Implementation Unit (PIU) & Provincial Energy Department and furnish updated progress reports regarding strengthening work of LMB of Taunsa Barrage and construction of hydro power station on right side of Taunsa Barrage on regular basis to FFC.

xv. The Cantonment Boards of Chaklala & Rawalpindi to complete the ongoing process of demarcating the boundaries of waterway of Lai nullah in consultation with Revenue department. Thereafter, case may be initiated for removal of encroachments over the banks & bed of Lai nullah. The status report would be submitted to FFC well before next review meeting.

xvi. WASA Rawalpindi to ensure completion of the de-silting work and removal of buildings waste, garbage and encroachments in critical reaches of Lai Nullah well before start of monsoon season 2017. The progress on the job would be shared with FFC on regular basis till its completion.

xvii. PID Punjab & Sindh and Pak Railway to expedite the ongoing/planned rehabilitation/ remodelling works of Barrages & Bridges and submit progress report to FFC regularly on monthly basis till completion of projects. Appropriate pre-emptive/ short term measures may also be carried out at all critical projects location by PID Punjab, PID Sindh and Pak Railway for safe passage of flood flows during monsoon season 2017.

xviii. NHA to expedite action of execution of remaining works and submit progress report on regular basis to FFC till completion of task.

xix. Chief Engineering Advisor/ Chairman, FFC would write D.O letter to Chairman NHA to ensure senior level participation of NHA in FFC's future meetings.

xx. WAPDA to carry out project activities on fast track basis. The progress on project may be shared with FFC on regular basis till completion of the project.

xxi. PCIW to continue efforts and share information/progress report on regular basis with FFC till resolving the issue.

xxii. Chief Engineering Advisor/ Chairman, FFC would write D.O Letter to Chief Secretary Balochistan asking for ensuring senior level representation from Irrigation Department, Govt of Balochistan, in FFC's future meetings.

xxiii. PID, Balochistan will complete the balance work on strengthening vulnerable/ weak sections of flood protection infrastructures before 30th June 2017. The progress report would be submitted regularly to FFC till completion of task.

xxiv. PIDs & FLAs will furnish the information of O&M funds without further delay to FFC for taking further action in the matter.

xxv. PIDs & FLAs including NDMA /PDMAs/ GB-DMA/ FDMA/ SDMA to prepare their Contingency Plans for monsoon season 2017 and share hard as well as soft copies with FFC for uploading on its website.

xxvi. Chief Engineering Advisor/ Chairman, FFC would write D.O Letter to Chief Secretaries of the concerned provinces and federal line agencies, asking for ensuring senior level representation from PDMA Sindh, GB-DMA & SDMA AJ&K in FFC's future meetings.

xxvii. NDMA to continue pursuing the case with PDMAs for establishing DDMAs as dedicated independent entities. Efforts be made to make them fully operational during the monsoon season 2017. The progress on the issue would be shared with FFC on regular basis.

xxviii. PID KP to furnish copy of Law named "Khyber Pakhtunkhwa River Ordinance 2002" to FFC for purpose of record. PID, Sindh & Balochistan including FLAs to pursue their case with concerned authorities for early approval and enforcement of River Act before start of next monsoon season.

xxix. PID, Sindh would submit detailed report on curtailment of funds to FFC for consideration in the next review meeting.

xxx. PID, Sindh would submit updated detailed status regarding who lost jobs as result of show cause notices to FFC for consideration in the next quarterly review meeting.

xxxi. PID, Sindh would pursue the case of Shuja Junejo lie with Chief Secretary office in the light of FFC's DO letter and submit the updated status to FFC for consideration in the next review meeting.

xxxii. NDMA to ensure that PDMAs have met the requirements of Pak Army regarding rescue and relief equipment before start of monsoon season 2017. The updated progress report would be submitted to FFC well before the start of monsoon season 2017.

xxxiii. Karachi Metropolitan Corporation (KMC) to submit the requisite information to FFC without further delay for consideration in the next meeting.

xxxiv. Chief Engineering Advisor/ Chairman, FFC would write D.O Letter to Chief Secretary, Government of Sindh asking for ensuring senior level representation from KMC in FFC's future meetings.

xxxv. SIDA may pursue the case with Government of Sindh for approval of Plan for long term measures and arrangement of funds for implementation of proposed interventions on priority basis.

xxxvi. Chief Engineering Advisor/ Chairman, FFC would write D.O Letter to Chief Secretary, Government of Sindh asking for ensuring senior level representation from SIDA in FFC's future meetings.

xxxvii. SIDA to improve the quality of ongoing work as per design specification and approved scope of work. The observations of FFC's Monitoring Team may be fully addressed. Work may be carried out on war footing basis so as to complete the same before raising of water level in Indus River. The progress on job may be shared with FFC on fortnightly basis t till completion of task.

xxxviii. Both WAPDA & PID, Sindh to resolve the issue on priority basis. The progress on the issue may be shared with FFC on regular basis till the issue is decided.

4.3 Meeting to review the priority projects/ activities which were likely to be carried out during 1st year of implementation of NFPP-IV, besides, progress made on the decisions of 1st pre monsoon season 2017 meeting of FFC held on 1st June 2017

Another meeting to review the priority projects/ activities which were likely to be carried out during 1st year of implementation of NFPP-IV, besides, progress made on the decisions of 1st pre monsoon season 2017 meeting of FFC held on 28th March 2017 was held on 1st June 2017. The following directions were issued to PIDs/ Federal Line Agencies, WAPDA, WASA & PMD etc:

i. Provincial Irrigation Department and Federal Line Agencies including Ministry of Climate Change, NDMA, WAPDA, PMD, PCIW, Pak Railways, NHA and WASA, Rawalpindi etc. will submit to FFC the list of their priority projects/ activities to be considered for execution during the 1st year of implementation of approved NFPP-IV for inclusion in the umbrella PC-I of Phase-I of NFPP-IV.

ii. The concerned Provincial and Federal Government Level Organizations will submit to FFC their views/comments regarding constitution of a steering committee and hiring of 3rd Party/consultants for verification of all works under approved NFPP-IV in order to ensure transparency in its implementation.

iii. In compliance of CCI decision dated 02.05.2017, the Provincial Irrigation Departments of the four provinces, will process the summary for special allocation of funds during the year 2017-18 for execution of their priority schemes/projects during 1st Year of implementation of NFPP-IV. Detail of funds required to be arranged by the Provincial & Federal Governments under Phase-I (during the next five years).

iv. The concerned provincial and federal government departments/organizations will nominate their Focal Person (BS-20 preferably) for future coordination with FFC and other organizations regarding implementation of all activities/projects under NFPP-IV.

v. The consultant (NESPAK) will submit to FFC umbrella PC-I of NFPP-IV by/before 10th June 2017, clearly indicating the priority works as indicated by PIDs, FLAs and other concerned agencies, for consideration during next meeting of FFC on NFPP-IV, which is likely to be held in first week of July 2017.

vi. **Provincial Irrigation Departments & Federal Line Agencies** will ensure completion of flood protection schemes under Normal/ Emergent Flood Program, strengthening works of all critical points/weak sections and FDR works including O&M works related to Barrages/Head Works before the start of monsoon season 2017. The compliance report would be submitted to FFC **by/before 30th June 2017**.

vii. **Provincial Irrigation Departments & Federal Line Agencies** will finalize District/ Division-wise Flood Fighting Plans, keeping in mind lessons learnt during the past consecutive flood events and ensure their circulation among concerned organizations **by/before 30th June 2017**.

viii. **PID Punjab including NHA, Pak Railways** will ensure arrangements of explosive and others material at sites of pre-determined breaching sections and stone reserve stock/ flood fighting material to be arranged at all critical reaches of flood embankments as identified during pre-flood inspections before start of monsoon season 2017 **(before 15th June 2017).**

ix. **Provincial Irrigation Departments & Federal Line Agencies** will ensure to expedite the ongoing process of removal of encroachments from flood Protection infrastructure and flood plains before start of Monsoon Season 2017 **(by/before 30th June 2017).** The updated compliance report may be submitted to SUPARCO in the light of decisions taken during 5th quarterly meeting of FFC without further delay under intimation of FFC, which would be reviewed during the 52nd Annual Meeting of FFC, likely to be organized shortly.

x. **Provincial Irrigation Departments & Federal Line Agencies** including **NDMA /PDMAs/ GB-DMA/ FDMA/ SDMA to** prepare their Contingency Plans for monsoon season 2017 and share hard as well as soft copies of the same with all concerned organizations including FFC for uploading on its website.

xi. **Provincial Irrigation Departments & Federal Line Agencies** will ensure submission of all necessary flood information/ rivers flow data to all concerned agencies including FFC & FFD, Lahore, regularly on daily basis, during the entire monsoon season 2017. PMD/FFD, Lahore will ensure submission of necessary rainfall data/ radars data to NESPAK for concurrent test run of FEWS, both at FFC and FFD, Lahore during monsoon season 2017.

xii. **PID, Punjab** will ensure completion of ongoing strengthening works of "Minchin Flood Bund", "Mashko Flood Bund" & Jhelum Flood Protection Bund through Provincial resources well before the start of monsoon season 2017. In case of their

non-completion before start of monsoon season 2017, necessary short term measures may be planned as "Contingency Plan" to be observed for safe passage of flood flows during 2017 monsoon season.

xiii. **PID, Punjab** to prepare an exclusive "Contingency Plan 2017 for Shahdara Railway Bridge" incorporating all necessary short term/ pre-emptive measures required to be carried out for safe passage of flood flows during the monsoon season 2017. Meanwhile, action regarding preparation of a comprehensive & implementable/feasible project proposal (socially, environmentally & politically acceptable proposal) may also be expedited in consultation with all concerned organizations including concerned Corps of Engineers of Pak Army regarding the long outstanding issue of "*Enhancing the discharge capacity of Shahdara Railway Bridge across River Ravi*". Thereafter, PC-I may be prepared by PID Punjab in consultation with all concerned organizations and process the same on priority basis for approval and funding arrangements.

xiv. **PID, Punjab** to include the project proposal regarding "Provision of flood protection facilities in Punjab province for protection of Kashmore Garrison and adjoining area from flood flows of Shori nullah" in the priority list of works to be carried out under Normal/Emergent Flood Programme of PSDP (2017-18).

xv. **WAPDA** to expedite early release of funds (Rs 16.630 million) required for repair of 24 damaged flood telemetric stations of WAPDA before the start of monsoon season 2017.

xvi. **WAPDA** to submit to FFC draft revised SOPs of Tarbela Dam Project, without further delay for their review and further processing for approval from Ministry of Water & Power, so as complete the task before start of monsoon season (i.e. **30th June 2017)**.

xvii. **WAPDA** to expedite the matter regarding signing of a formal written agreement with Pak Army/ Mangla Garrison regarding their consent for shifting of installations/buildings etc. to safer places for passage of at least 20,000 cusecs through Barakas nullah as immediate short term measure, for operation of Emergency Spillway of the reservoir in case of occurrence of 1992 like flood situation.

xviii. **PMD, FFD, Lahore & WAPDA** will ensure completion of all essential repair/ maintenance works of Flood Forecasting and Warning System equipment and ensure that the System including Radars Network (Lahore, Sialkot and Mangla in particular) is fully functional **by/before 30th June 2017**.

xix. **PCIW** to continue the follow up actions in the light of decisions of their recent dialogues with ICIW held in Islamabad, for obtaining discharges of Eastern Rivers and Chenab River flood flow data at Salal HEP, 56 KM upstream of Akhnoor bridge across Chenab River, besides inflows & levels of reservoirs across Eastern rivers i.e. Bhakra, Pong & Thein Dam Projects and its transmission to end users (FFC, PMD/FFD, Lahore, WAPDA, NDMA & PDMAs etc.) during monsoon season 2017.

xx. **NDMA** in consultation with Pak Army, PDMAs and DDMAs will ensure completion of all necessary arrangements regarding rescue and relief activities that may require to be carried out during the flood emergency in the coming monsoon season 2017.

xxi. **Deputy Commissioner, Rawalpindi** will expedite completion of ongoing demarcation activity regarding right of way of Lai Nullah and ensure removal of encroachments from the bed & banks of Lai Nullah before start of monsoon season 2017 **(30th June 2017).**

xxii. **WASA Rawalpindi** will ensure completion of dredging/de-silting work of Lai Nullah well before the start of monsoon season 2017 so as to ensure smooth passage of flood flows during monsoon season 2017.

4.4 Flood Communication Cell of FFC

The Flood Communication Cell of Federal Flood Commission had started functioning on round-the-clock basis from 15th June 2017 till end monsoon season (15th October 2017) for collection, compilation rainfall, rivers flow data and reservoir water levels and its transmission to concerned agencies at Federal and Provincial Government level on daily basis in normal/low flood stage and 6-hourly basis in case of high flood levels in main rivers. Based on PMD's Weather Forecasts and Advisories, since July 01, 2017, FFC's daily flood/weather situation report through its Flood Communication Cell, was being issued to all concerned agencies on daily basis till end monsoon season (2017).

4.5 52nd Annual Meeting of Federal Flood Commission held on 11.07.2017

The 52nd Annual Meeting of Federal Flood Commission was held on 11th July 2017 under the Chairmanship of Honourable Federal Minister for Water & Power in the Committee Room of office of CEA/CFFC Islamabad, in order to review the status of preparedness of the Provinces & Federal Line Agencies for Monsoon Season 2017. The following directions were issued to PIDs/ Federal Line Agencies, WAPDA, WASA & PMD etc.:

i. **PMD** to closely watch the weather situation during entire monsoon season 2017. PMD in collaboration with **PCIW,** to also carefully determine the validity/reliability of data provided by India through its own Radar Network and other Flood Forecasting &Warning System facilities, while using the same for flood management operation in the country.

ii. **WAPDA** to closely watch the weather & flood situation and ensure safe routing of likely surplus flood inflows in Tarbela and Mangla reservoirs during the monsoon season 2017 as per existing approved SOPs. Flood flows through Atta Abad Lake and similar other vulnerable glacial lake sites may also be monitored by WAPDA in view of likely threat of any GLOF event upstream of the lakes.

iii. **GEPCO** will ensure immediate placement of new transformer to resolve the power supply problem of Sialkot Weather Radar so that radar products are effectively utilized unhindered in generating timely and precise forecasts by FFD, Lahore.

iv. **PCIW** to ensure that all necessary arrangements are in place for obtaining reservoir and rivers flows data and other information from Indian counterpart

(ICIW) regarding River Chenab and Eastern Rivers during monsoon season 2017 and its timely transmission to all stakeholders including FFD, Lahore.

v. **SUPARCO** besides hosting the information on Website, to share its rivers monitoring report with PCIW, PMD and FFC on daily basis for its effective use for forecasting the flood flows of all major rivers, particularly the flood flows of Eastern Rivers coming from India.

vi. **PMD/FFD, Lahore** will share with FFC the progress report on all ongoing replacement works of existing Radars including Sialkot, Mangla, Islamabad and Lahore Radars, besides, copy and status of approval of comprehensive proposal/PC-I titled *"Strengthening of Early Warning System of PMD costing Rs. 19.081 Billion".*

vii. **Engineers Directorate, GHQ** will take up the matter with Mangla Garrison regarding agreed shifting of buildings and other military installations to safer locations, as short term measure, for likely operation of Emergency Spillway of the reservoir in case of occurrence of 1992 like flood situation and initiate working on ground, after fulfillment of codal formalities with WAPDA & other stakeholders.*[Note: Decision may be read in the backdrop of deliberations of the meeting recorded at Para 12 of the minutes]*.

viii. **WAPDA's (H&W Wing)** will make efforts for early completion of ongoing repair/rehabilitation work of non-functional Flood Telemetry Stations. Till completion of the task, arrangements will be made to collect flood data manually and transmit the same to FFD, Lahore and other end users for flood forecasting purpose without interruption during current monsoon season. The progress report will be shared with FFC on monthly basis. WAPDA will also furnish the report to MOWP when the restoration works are completed.

ix. **NDMA** in consultation with Pak Army, PDMAs and DDMAs will ensure completion of all necessary arrangements regarding rescue and relief activities to be carried out during the flood emergency during ongoing monsoon season 2017.

x. **NDMA** will ensure that all rescue and relief items, including flood fighting heavy machinery, available with PDMAs/DDMAs have been placed at vulnerable districts for their speedy immediate use in case of emergency situation. The progress report will be shared with FFC within week's time.

xi. **NDMA** in coordination with PDMAs/FDMA/GBDMA/SDMA to review, rationalize and meet the previous/additional demands of Pak Army regarding provision of rescue and relief equipment to concerned Corps of Engineers. The progress report will be shared with FFC on monthly basis.

xii. **NHA** will follow up the case with Planning Commission regarding approval of PC-I prepared for construction work of both LMB & RMB (Flood Embankments on upstream side) of Shaheed Benazir Bhutto Bridge. The progress report will be shared with PID, Punjab and FFC on monthly basis.

xiii. Revised Flood Management Committee of Mangla Dam stands approved by the forum. **M/s NESPAK**, being member of Flood Management Committee, will continue rendering its gratis services for conducting the Mock Exercise at Mangla Dam Site. M/s NESPAK will also depute its experts for training the concerned

staff of PDMA-Punjab & PDMA-Sindh besides for KP on flood plain inundation maps of major rivers and submergence plans of vulnerable districts, prepared under NFPP-IV studies.

xiv. **Provincial Irrigation Departments & Federal Line Agencies** (PIDs & FLAs) will ensure completion of ongoing flood protection schemes under Normal/ Emergent Flood Program, strengthening works of all critical points/weak sections and FDR works including O&M works related to Barrages/Head Works without further delay i.e. by or before 31st July 2017. Priority lists alongwith PC-Is of new flood protection schemes, duly cleared by PDWP, and to be taken under Normal/ Emergent Flood Programme (2017-18) should also be submitted to FFC latest by 31st July 2017 for further processing for their timely approval by the DDWP/CDWP/ECNEC and subsequent release of funds by Ministry of Water & Power.

xv. **PIDs & FLAs** to remain vigilant and ensure patrolling on round the clock basis of flood protection infrastructure, especially vulnerable sections of Barrages/Headworks and allied structures during monsoon season 2017.

xvi. **PIDs and FLAs** will take up the matter with respective Provincial Cabinets regarding approval for enactment of River Act proposed by FFC for flood plains regulation and its enactment for removal of existing encroachments and restricting new settlements in the flood plains.

xvii. **PIDs & FLAs** to ensure removal of encroachments from flood plains/waterways causing hindrance in flood flows. The compliance report would be regularly submitted to FFC on monthly basis till completion of the task.

xviii. **Deputy Commissioner, Rawalpindi** will ensure removal of encroachments from the waterway and banks/bed of Lai Nullah. The compliance report would be regularly submitted to FFC on monthly basis till completion of the task.

xix. **PIDs and FLAs** including PDMAs/FDMA/SDMA & GB-DMA will submit to FFC hard & soft copy of Contingency Plans for Monsoon Season 2017, for uploading on its website.

xx. **PIDs & FLAs** will also maintain a sustained coordination with concerned PDMAs/District Administrations and WASA's in order to ensure that all necessary arrangements were at place for effective management of flash/urban floods & GLOFs, as well.

xxi. **PID, Punjab** will coordinate with IRI, Nandipur, Lahore for early completion of ongoing Hydraulic Model Studies of Alexandra, Revaz and Shershah Railway Bridges. The progress report will be shared with Pak Railway & FFC regularly on monthly basis.

xxii. **PID, Punjab** will expedite the work on Minchin Flood Bund project, so that it would be completed before 31st July 2017. The compliance report would be submitted to FFC for taking further action. Short term remedial measures should be arranged on war footing basis on all other vulnerable sites including Mashka bund, Jhelum Flood Bunds for safe passage of flood flows during monsoon season 2017.

xxiii. **PID, Punjab** will prepare PC-I for protection of Kashmore Garrison and adjoining area (permanent remedial measures) and process the same on fast track basis for timely approval and implementation before next monsoon season (2018).

xxiv. **PID, Punjab** in consultation with other concerned organizations will prepare a comprehensive proposal i.e. long term measures (based upon model study recommendations) regarding long outstanding issue of "Increasing discharge capacity of Shahdara Railway bridge across River Ravi" and process the same for approval and implementation. Meanwhile, all necessary short term arrangements would be made at site for safe passage of flood during monsoon season 2017.

xxv. **Next meeting of FFC** would be held shortly to exclusively review the issue of non-functional instruments and proposed filling criteria of Tarbela Dam, besides, other outstanding issues related to preparedness for 2017 monsoon season.

4.6 Meeting of FFC to review the Existing SOPs of Tarbela Dam Project held on 20.07.2017

A meeting of FFC to review the Existing SOPs of Tarbela Dam Project was held on **20.07.2017** under the Chairmanship of Chief Engineering Advisor/ Chairman Federal Flood Commission in the Committee Room of office of CEA/CFFC, for assuring the safe passage of flood flows during monsoon season 2017. The following directions were issued:

i. Keeping in view the current status of instrumentation presented by the TDP Authorities, the existing SOPs should be applied for the ongoing monsoon season (From EL 1510 and above) rather than the proposed filling criteria.

ii. Detail of instruments installed at different locations and their current status should be shared on quantitative basis, while providing last 16-years data for various piezometers and other instruments.

iii. Time line for 100% rehabilitation/ revamping of all instruments be shared.

iv. TDP Authorities should provide analysis of instrumentation data alongwith filling and emptying pattern from EL 1510 and above for last 16 years covering from the year 2000 to 2016. This would also include results of analysis.

v. The revised filling criteria should only be considered after going through findings/ recommendations of Phase-II of 6th Periodic Inspection.

vi. TDP Authorities would also clarify as to who shall be the competent to invoke the revised/ proposed filling criteria (GM-TDP/ Dam Management Committee/ else)

vii. What stringent measures and monitoring mechanism was devised/ put in place for vigilant, more frequent monitoring of instrumentation and of dam whenever the rate of reservoir rise is more than one (1) feet/ day at reservoir elevates higher than 1510 feet.

viii. It is to be clarified as to whether the requirement of plotting data on daily/ hourly basis, in case of any abnormal behaviour arises, and if so what was the action taken.

ix. With reference to item at Sr. No. 2 of minutes of the meeting dated 31st May 2017, WAPDA should come-up with a clear point of view on raising of MOL from 1380 feet to 1384 feet.

x. For the present monsoon season WAPDA should rationally operate the reservoir, in accordance with IRSA's directions well in alignment with dam safety rules as dam safety has a paramount importance and needs to be kept in focus always.

xi. Issue of Automization & Up-gradation of existing Instrumentation System, (Automatic Data Acquisition System, (ADAS)) at TDP, pending since 2013, needs to be accelerated and a concise proposal in this regard should be implemented to keep the complete set up of instrumentation at Tarbela Dam fully operational with no faults. The same proposal be furnished to Ministry of Water & Power through FFC for appropriate decision.

4.7 Special meeting of FFC related to various issues pending with PID & FLAs held on 21.07.2017

A special meeting of FFC related to various issues pending with PID & FLAs was held on **21.07.2017** under the Chairmanship of Chief Engineering Advisor/ Chairman Federal Flood Commission in the Committee Room of office of CEA/CFFC and various instructions were conveyed to all concerned organizations. The following directions were issued to PIDs/ Federal Line Agencies, WAPDA, WASA & PMD etc:

i. **WAPDA's (Tarbela Dam Authority)** by virtue of FFC's recommendations given in Para-11 of the minutes above, will rationally operate the reservoir, in accordance with IRSA's directions well in alignment with dam safety rules and prepare a comprehensive proposal for installation of new instruments at Tarbela Dam site, also incorporating the recommendations of 6th Periodic Inspection (Phase-II scheduled in August 2017) regarding issue of non-functional instrumentations.

ii. **Engineers Directorate, GHQ** will expedite work on the *rehabilitation of Barakas nullah upto 7000 cusecs under Phase-I* and ensure shifting of buildings and other military installations to safer locations, as short term measure, for likely operation of Emergency Spillway of the reservoir in case of occurrence of 1992 like flood situation. Work be completed in 2 weeks time period. Followed by this, work may also be initiated on rehabilitation of *Barakas nullah upto 20,000 cusecs as Phase-II* and completed in the following 2 weeks. Necessary details be shared with all concerned including FFC.

iii. **PMD/FFD, Lahore** will share with FFC the updated list of priority projects related to all ongoing replacement works of existing Radars including Sialkot, Mangla, Islamabad and Lahore Radars and installation of new radars for inclusion Umbrella PC-I of NFPP-IV.

iv. **WAPDA's (H&W Wing)** will make efforts for early completion of ongoing repair/rehabilitation work of non-functional Meteoroburst Telecommunication Flood Telemetry Stations. Till completion of the task, arrangements will be made to collect flood data manually and transmit the same to FFD, Lahore and other end users for flood forecasting purpose without interruption during current monsoon season. The progress report will be shared with FFC & Ministry of Water & Power on monthly basis, till completion of task.

v. **NHA** will follow up the case with Planning Commission regarding approval of PC-I prepared for construction work of both LMB & RMB (Flood Embankments on upstream side) of Shaheed Benazir Bhutto Bridge. The progress report will be shared with PID, Punjab and FFC on monthly basis. It will be ensured to execute the works before the start of next monsoon season (2018). Meanwhile necessary arrangements may be made at site in consultation with PID, Punjab for safe passage of flood flows during current monsoon season (2017).

vi. **PID, Punjab** will coordinate with IRI, Nandipur, Lahore for early completion of ongoing Hydraulic Model Studies of Alexandra, Rivaz and Shershah Railway Bridges. The progress report will be shared with Pak Railway & FFC regularly on monthly basis.

vii. **PID, Punjab** will expedite the work on Minchin Flood Bund Project, ensuring its completion on or before 31st July 2017. The compliance report would be submitted to FFC for taking further action. Short term remedial measures should be arranged on war footing basis on all other vulnerable sites including Mashka bund, Jhelum Flood Bunds for safe passage of flood flows during monsoon season 2017.

viii. **PID, Punjab** will arrange site visit of all concerned organizations regarding proposed protection measures of Kashmore Garrison and adjoining area (permanent remedial measures) for making further recommendations for implementation of proposed works before next monsoon season (2018).

ix. **PID, Punjab** will ensure that all necessary short term arrangements were made at site for operating breaching section at Shahdara Railway bridge during monsoon season 2017. Fresh river survey will also be carried out and submitted to IRI, Nandipur Lahore for conducting fresh model study of the areas, based on which, a comprehensive proposal i.e. long term measures regarding long outstanding issue of "Increasing discharge capacity of Shahdara Railway bridge across River Ravi" will be prepared by PID, Punjab and processed for approval and implementation.

4.8 Post Flood Meeting of FFC held on 22.11.2017

The Post Flood meeting of Federal Flood Commission was held on November 22, 2017 in office of the Chief Engineering Advisor/ Chairman Federal Flood Commission, Islamabad under the Chairmanship of Chief Engineering Advisor/ Chairman FFC, Islamabad in order to review the damages caused to irrigation, drainage and flood protection infrastructure due to 2017 rains/floods. The following major directions were also issued to PIDs/ Federal Line Agencies, WAPDA & PMD for improving the flood management during monsoon season 2017.

i. **SUPARCO** to organize at appropriate time **(before start of monsoon season 2018)** the training course on rivers flow monitoring being done by them for its effective use of forecasting the flood flows for all major rivers, particularly the flood flows of Eastern Rivers coming from India for training the officers of all concerned organizations dealing with flood management at Federal as well as Provincial government level.

ii. **PMD/FFD, Lahore** to share with FFC within a month's time the comprehensive report on existing Flood Forecasting facilities, Radar Network, the projects taken in hand and those planned to be implemented in future (Short term as well as long term measures).

iii. **Engineers Directorate, GHQ** to take up the matter with Mangla Garrison through concerned Corps of Engineers regarding rehabilitation works of Barakas Nullah (Phase-II works). Efforts be made to complete the task well **before the start of 2018 monsoon season**. Mangla Dam Authority/WAPDA to take up the matter very seriously and ensure full cooperation for timely completion of sites investigation and completion of Phase – II works.

iv. **WAPDA's (H&W Wing)** to make utmost efforts for timely completion of ongoing repair/rehabilitation work of non-functional Flood Telemetry Stations. The progress report be shared with FFC on monthly basis till completion of task.

v. **NHA** to follow up the case with Planning Commission regarding approval of PC-I prepared for construction work of LMB & RMB/Flood Embankments on upstream side of Shaheed Benazir Bhutto Bridge. NHA to ensure physical completion of proposed interventions well **before the start of 2018 monsoon season**. The progress on the project would be shared with PID, Punjab and FFC on monthly basis till completion of project.

vi. **Provincial Irrigation Departments & Federal Line Agencies (PIDs & FLAs)** to ensure completion of all approved/ongoing flood protection schemes taken up under Normal/ Emergent Flood Programme, rehabilitation/strengthening works of all critical points/weak sections and Flood Damages Restoration Works including O&M works related to Barrages/Head Works/Bridges, Irrigation, Drainage and Flood Protection Infrastructure well before the start of 2018 monsoon season/ **30th June 2018**.

vii. PC-Is of all newly proposed flood protection schemes (alongwith clearance by PDWP) of works to be under taken through Normal/ Emergent Flood Programme (2017-18) would be submitted to FFC **without further delay** for technical clearance of Scrutinizing Committee of FFC and approval of DDWP/CDWP and hence their execution before 30th June 2018.

viii. PIDs & FLAs to submit demand for release of funds allocated under PSDP (2017-18) for Normal/Emergent Flood Programme to FFC **without further delay** for taking up the case with Planning Commission through Ministry of Water Resources.

ix. **PIDs and FLAs** to take up the matter with respective Provincial Cabinets regarding approval and enactment of River Act (Draft prepared by FFC) for flood plains regulation i.e. removal of existing encroachments and restricting new settlements in the flood plains. The present status shall be reported to FFC within a fortnight by all the PIDs.

x. **PIDs & FLAs** to ensure removal of encroachments from flood plains/High Risk Zones, waterways, which are under the threat of flood waters and also causing hindrance in flood flows. The progress on the job would be submitted to FFC on monthly basis till completion of the task. The entire exercise would be completed well before the start of 2018 monsoon season.

xi. **Deputy Commissioner, Rawalpindi** will ensure removal of encroachments from the waterway and banks/bed of Lai Nullah. The compliance report would be regularly submitted to FFC on monthly basis till completion of the task. The

progress on demarcation of Lai Nullah in Rawalpindi City would be accelerated so as to complete the task well before the start of 2018 Monsoon season.

xii. **PID, Punjab** will coordinate with IRI, Nandipur, Lahore for early completion of ongoing Hydraulic Model Studies of all Barrages/Bridges i.e. Garh Maharaja and Head Muhammad Wala Bridge of NHA, Alexandra, Revaz and Shershah Railway Bridges. The progress report will be shared with Pak Railway & FFC regularly on monthly basis.

xiii. **PID, Punjab** to speed up progress on ongoing Minchin Flood Bund project, Mashka bund, Jhelum Flood Bunds, so as to complete all the three projects well before the start of 2018 monsoon season.

xiv. Irrigation Department, Government of Sindh to speed up progress on the under construction Ring Flood Bund being constructed around Kashmore Garrison, so as to fully complete the project well before the start of 2018 monsoon season. The progress (on monthly basis) on the work be shared with all concerned organizations including FFC till completion of the job.

xv. WAPDA through P.D. Kachhi Canal Project to carry out site survey in consultation with concerned Corps of Engineer, Pak. Army and PID, Punjab in order to know the contour and waterway/routes of Shori Nullah and take appropriate remedial measures (construction of flood embankments) for guiding the flood water of Shori Nullah for safe passage through Super Passage constructed at RD 865 & 875. The entire exercise be completed well before the start of 2018 monsoon season. The progress (on monthly basis) on the work may be shared with all concerned organizations including FFC till completion of the job.

xvi. **PID, Punjab** in consultation with other concerned organizations will prepare a comprehensive proposal/PC-I (based upon model study recommendations) regarding long outstanding issue of "Increasing discharge capacity of Shahdara Railway bridge across River Ravi" on top priority basis and process the same for approval of concerned fora and its implementation on fast track to further avoid the delay already caused.

4.9 Quarterly meeting of FFC held on 05.12.2017 to review status of compliance of directions given by the Honourable Supreme Court of Pakistan on the recommendations of Flood Inquiry Commission.

The 6th quarterly meeting of Federal Flood Commission was organized on 5th December 2017 to review the status of compliance of directions given by the Honourable Supreme Court of Pakistan related to Constitution Petition No. 62 of 2010, filed by Ms Marvi Memon versus Federation of Pakistan, through Secretary Cabinet & others. Following decisions were taken related to flood preparedness of the four Provincial Irrigation Departments and Federal Line Agencies, WAPDA & PMD etc.:

i. PIDs, FLAs and all concerned organizations were requested to forward compliance reports regularly to FFC on monthly basis for onward submission to Honourable Supreme Court of Pakistan.

ii. PID Sindh to submit details of encroachment which were slashed down and strategically left for economic reason to SUPRCO under intimation of FFC latest by/before 25th December, 2017.

iii. PIDs Sindh also provide certificate from the Sindh Government stating that those encroachment were left strategically considering good for economy latest by/before 25th December, 2017.

iv. PID Sindh will depute GIS Expert to coordinate and facilitate SUPARCO during process of verification of the encroachment removed, slashed down and strategically left and will complete the verification process by/before 25th December, 2017.

v. PID Punjab will submit detail of encroachments in proper format within Weeks's time to SUPARCO for verification.

vi. PID Punjab will remove all encroachment by/before 15th March, 2018 and the same would get verified by SUPARCO.

vii. PID KP, FATA secretariat, GB-PWD and AJK will submit Certificate from respective provincial government that there are no encroachments in the respective area which restrict the water flowing in the Rivers/Nullahs during floods by/before 15th January, 2018.

viii. PID Balochistan will complete the removal of encroachments in Loralai District by/before 15th January, 2018.

ix. PID Balochistan will submit certificate duly signed by the Chief Secretary that there are no encroachments were left in the province that restrict the water flows during floods by/before15th January, 2018.

x. H&WM Wing of WAPDA to ensure the restoration work of 24 damaged Flood Telemetry Stations by 31st December 2017

xi. Work on upgradation of entire Flood Telemetry Network through WCAP may also be pursued with PMPIU on priority basis, so as to complete the job at the earliest. The progress may be shared with FFC till completion of the job.

xii. Pakistan Metrological Department/FFD, Lahore to share the details of Phase-I and Phase-II works and continue pursuing case for approval and arrangement of funds through external donor agencies for expansion of its Radar network & establishment of other flood forecasting and early warning systems in the country. The progress on the case will be shared with FFC on regular basis.

xiii. PIDs and FLAs (Irrigation Directorate FATA, GB-PWD & Irrigation Department AJK) including Watershed management authorities of Mangle & Tarbela Dams Projects, to keep close liaison with their respective Forest Departments for watershed management/ forestation promoting activities in the catchment areas of rivers/hill torrents in order to check land sliding and excessive bed erosion, which would minimize flood damages.

xiv. WAPDA to submit PC-II by end of December and FFC will organize a meeting of all stakeholders to discuss the PC-II as soon as received form WAPDA.

xv. All Departments will nominate Focal persons from their organizations for the next quarterly review meetings.

xvi. PID Punjab to coordinate with Project Implementation Unit (PIU) & Provincial Energy Department and furnish updated progress reports regarding strengthening work of LMB of Taunsa Barrage and construction of hydro power station on right side of Taunsa Barrage on regular basis to FFC.

xvii. The Cantonment Boards of Chaklala & Rawalpindi to complete the ongoing process of demarcation of the boundaries of waterway of Lai nullah in consultation with Revenue department by/before 15th March, 2018. Thereafter, case may be initiated for removal of encroachments over the banks & bed of Lai nullah. The status report would be submitted to FFC on regular basis.

xviii. PID Punjab & Sindh to expedite the ongoing/planned rehabilitation/ remodeling works of Barrages and submit progress report to FFC regularly on monthly basis till completion of projects.

xix. NHA to expedite action of execution of remaining works and submit progress report on regular basis to FFC till completion of task.

xx. The critical locations which have not been located in the project, works may be undertaken on them also.

xxi. NHA to follow the recommendations of Model Study in true letter and spirit.

xxii. WAPDA to keep on providing the progress of Munda Dam project on regular basis till completion of the project.

xxiii. PIDs & FLAs will furnish details of O&M funds required and allocated each year from 2010-11 to FFC for taking further action in the matter.

xxiv. The details of critical locations requiring attention and funds needed for that may also be shared with Federal Government.

xxv. PID, Sindh & Balochistan including FLAs to pursue their case with concerned authorities for early approval and enforcement of River Act before start of next monsoon season.

xxvi. KMC to continue their efforts for removal of encroachments and keep the forum updated of progress. Representative of KDA be also invited in next meeting.

xxvii. SIDA to keep on providing the latest status till completion of the task (Shakoor Dhund).

xxviii. WAPDA and PID Sindh to arrange a meeting and resolve the issue of Rainee Canal among themselves and inform the progress to FFC.

4.10 Other activities/ initiatives under taken by Federal Flood Commission:

The following activities were taken by Federal Flood Commission during 2017:

4.10.1 Training Session on Flood Plain Inundation Maps of Major Rivers and Submergence Plans of vulnerable Districts held on 6th November 2017

Federal Flood Commission had since prepared its National Flood Protection Plan-IV (NFPP-IV) through Consultants M/s NESPAK. The Flood Plain Inundation Maps of

Rivers Indus, Jhelum, Chenab, Ravi, Sutlej, Kabul & Swat and Submergence Plans of vulnerable Districts were one of important tasks carried under the Plan. These maps have been prepared on A2 size sheets having four different inundation layers (Very High Risk Zone, High Risk Zone, Medium Risk Zone and Low Risk Zone), pertaining to various discharges. Inundation depth tables are provided at the end, showing name of villages/ settlements and category of risk zone. Maximum & minimum inundation depth at corresponding to above mentioned categories.

A training Session was organized by FFC on 6th November 2017 for all concerned organizations including NDMA, Provincial/ Regional Disaster Management Authorities, PIDs, AJ&K, GB-PWD, FATA etc. for better flood management in coming monsoon seasons.

4.10.2 One-day international workshop on overview of Hydrological and Hydraulic Modeling using HEC-RAS and HEC-HMS on29th November 2017

Federal Flood Commission (FFC) in collaboration with USAID organized a 1-day workshop on Hydrological and Hydraulic Modeling using HEC-RAS and HEC-HMS. The purpose of this workshop was to familiarize the participants with HEC-RAS and HEC-HMS modeling tools and with their other potential uses. It was found that these models could be applied in flood sector studies, floodplain management, floodplain insurance, Levee and flood walls/structural design, Bridge and culvert design, Channel design, Channel restoration, Sedimentation analysis, irrigation and dam safety besides wetland restoration etc.

Participants from all concerned federal and provincial departments including NDMA, Provincial/ Regional Disaster Management Authorities, PIDs, AJ&K, GB-PWD, FATA, PMD, PCRWR and academia, attended the introductory workshop. Overall response from the participants was very positive. They appreciated the efforts of FFC and were of the view that in future more detailed workshops/ trainings be organized on these models.

4.10.3 Joint consultative meetings on Integrated Flood Plain Management along River Indus to build resilience of Riverine Ecosystem and vulnerable communities to Climate Change

WWF Pakistan in collaboration with FFC is working on project titled *"Integrated Flood Plain Management along River Indus for diverting and storing flood water through ecological infrastructure".* A rapid assessment of potential sites (adjoining wetlands and natural depressions) along River Indus will be done to identify the potential sites for storages. In this context a stakeholder's consultative meeting was organized in premises of O/o CEA & CFFC on **14th December 2017**.

Eight (8) potential sites, as identified by WWP Pakistan for the proposed activity, were discussed in detail during the meeting. Following major decisions were taken:

i. Provincial Irrigation Departments (PIDs Punjab, Sindh & KP) will submit to FFC the list of potential sites to be developed as wetlands under WWF's project for storing extra flood water to harness social, ecological and environmental benefits.

ii. PCRWR will submit to FFC the recommendations of relevant studies for onward submission to WWF-Pakistan for incorporation in the project proposal being prepared by them for GCF.

iii. WWF team will further refine the criteria for identification of potential wetland sites in the light of detailed deliberations of the meeting given above and come up with refined list for consideration in the next meeting.

iv. Efforts may also be made by WWF-Pakistan to procure the LiDAR services from Pak Army for relatively more detailed & accurate survey of River Indus for identification of new wetlands sites with maximum potential of storing flood waters during flood season.

FLOODS-2017

5. MONSOON/FLOOD SEASON 2017

The geographical location and socio-economic fragility of Pakistan make it more vulnerable to the environmental, social and economic ramifications of climate change. In recent years, Pakistan has witnessed the vagaries of climate change with growing regularity and destructive ferocity. Droughts, desertification, glacial melt, sea-level rise and recurrent floods are all manifestations of climate-induced phenomena. The frequency of occurrence of floods has increased during the past several years due to global warming and rapid climate change.

5.1 Seasonal Rainfall Forecast for Monsoon Season 2017 issued by PMD

Pakistan Meteorological Department (PMD) issued the following seasonal forecast on June 14, 2017 for Monsoon Season 2017;

- Area weighted rainfall during monsoon season over Pakistan is expected to fall short of long term average. However, rainfall will be highly variable over temporal and spatial scale.
- During July, monsoon rainfall may range in normal limits but less than normal rainfall is likely in August and September.
- Less frequent rains in southern half of the country may trigger drought like conditions.
- There is a high probability of localized rain spells which may generate flash flooding in mountainous and sub-mountainous regions.
- Due to erratic behavior of summer monsoon, extreme precipitation events may occur at isolated places in the country, which can result into floods.
- Localized events of rainfall coupled with rapid melting in the glaciated regions of Gilgit-Baltistan and Chitral may trigger GLOF events.

5.2 Floods/Rains during Monsoon Season 2017

During the Monsoon Season (July-September) 2017, amount of rainfall was below normal (-22.48%) in the country (Source: PMD). During the three months, high temporal and spatial variable precipitation was observed. Normally, July and August are the wettest months in the country, however, during year 2017, below normal rainfall was observed during July and September in the country. Province /agency wise detail is given below:

i. Punjab (- 13.53%),
ii. Sindh (-28.91%),
iii. KP (-17.53%),
iv. Balochistan (-40.71%),
v. Gilgit-Baltistan (G-B) and Kashmir (-46.59%)

Figure-3 shows percentage of cumulative area weighed departure rainfall occurred during (July-September) 2017.

During July 2017, - 21.36% below normal rainfall received in the country with maximum departure in G-B and AJK (-51.77%). The rainfall was normal to below normal in all the provinces of the country i.e. Sindh (-7.68%), Punjab (-14.43%), KP (-31.43%) and Balochistan (- 32.05%). During August 2017, rainfall was again below normal (-25.65%)

in Pakistan, the maximum of which was in Balochistan (-56.86%), Sindh (-44.37%), G-B and Kashmir (-36.83%) and Punjab (-20.52%).

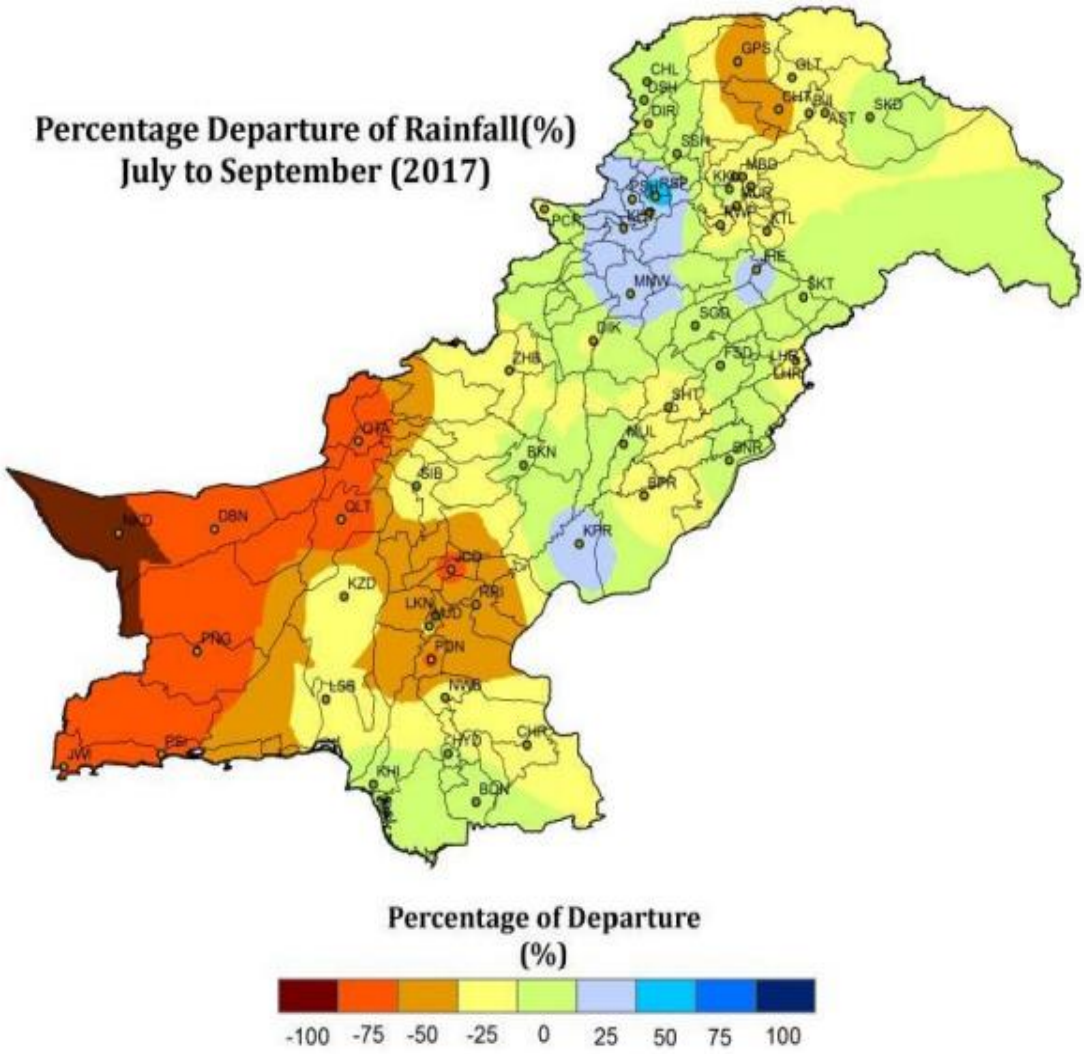


Figure 3: Area weighted (%) rainfall during (July-September) 2017

During September 2017, rainfall was below normal in the country (-17.31%), the below normal rainfall was observed in G-B and Kashmir (-54.14%), Sindh (-49.27%), Balochistan (-27.23%) and KP (-23.47%) while it was slightly above normal in Punjab (7.78%). **Figures 4, 5 & 6** given on succeeding pages show percentage area weighed departure rainfall occurred during July, August & September 2017 respectively.

Regarding river flows, the overall riverine flood situation remained normal at most of control points of major Rivers during the entire monsoon season 2017. River-wise flood situation observed during the entire monsoon season 2017, is explained below:

i. River Indus did not crossed Medium Flood Levels at Kalabagh, Chashma, Taunsa & Guddu. It remained in Low Flood at Tarbela, Sukkur and Kotri.
ii. River Chenab touched Low Flood Levels at Marala, Khanki and Qadirabad respectively. It remained Normal at Trimmu & Panjnad during the entire monsoon season 2017.

iii. Flow in River Jhelum remained Normal during the entire monsoon season 2017.
iv. River Ravi remained Normal during the entire monsoon season 2017.
v. Flow in River Sutlej also remained Normal during the entire monsoon season 2017.
vi. River Kabul at Nowshera did not exceed Low Flood Limit.

The inflow & outflow of major rivers observed during monsoon season 2017 at important control structures i.e. Reservoirs & Barrages are attached as **Appendix-II,** whereas month-wise rainfall data of monsoon season 2017 as received from PMD is attached as **Appendix-III**. The detail of Escapages below Kotri Barrage during the period {(1976-77) to (2016-17)} is attached as **Appendix-IV**.

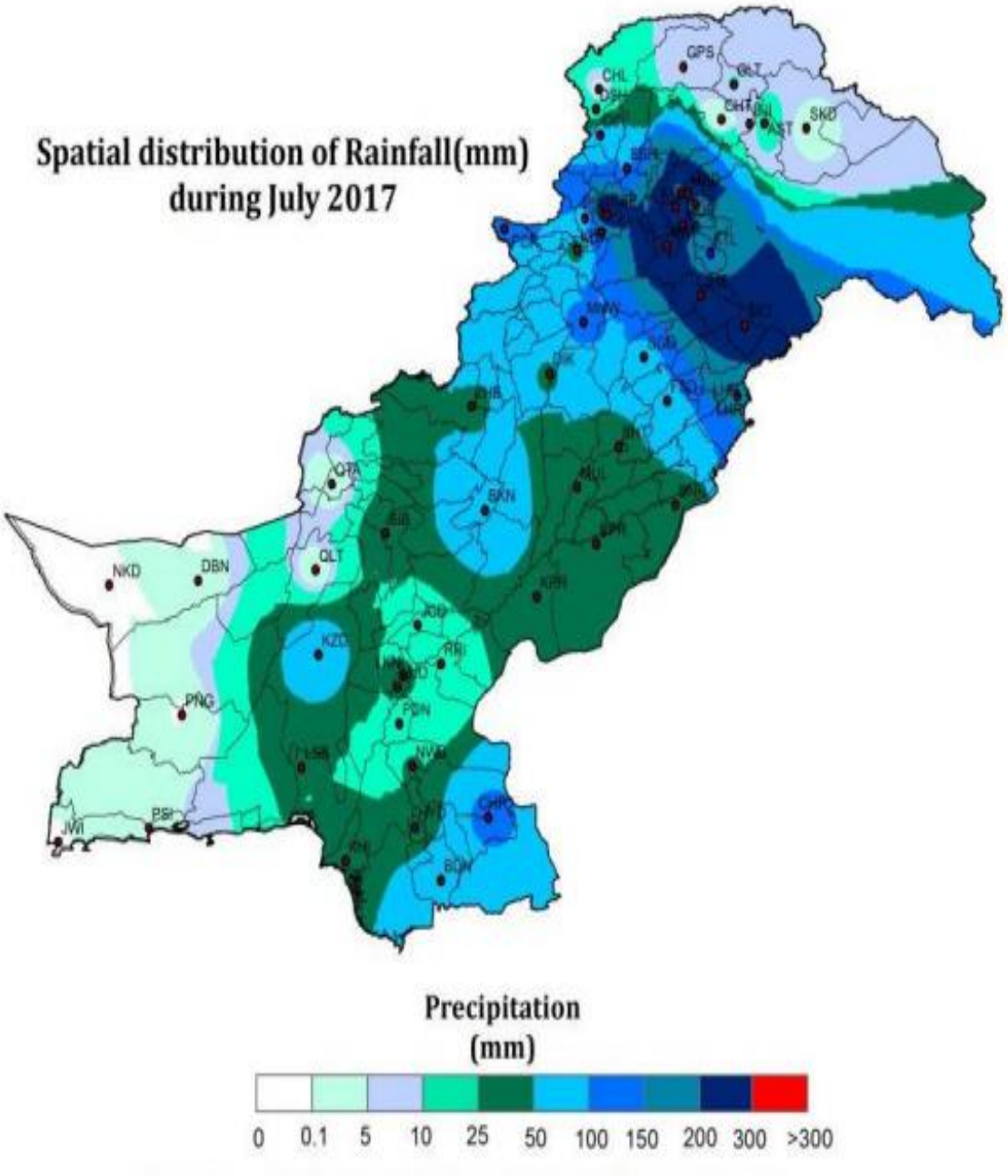


Figure 4: Area weighted (%) rainfall during July 2017

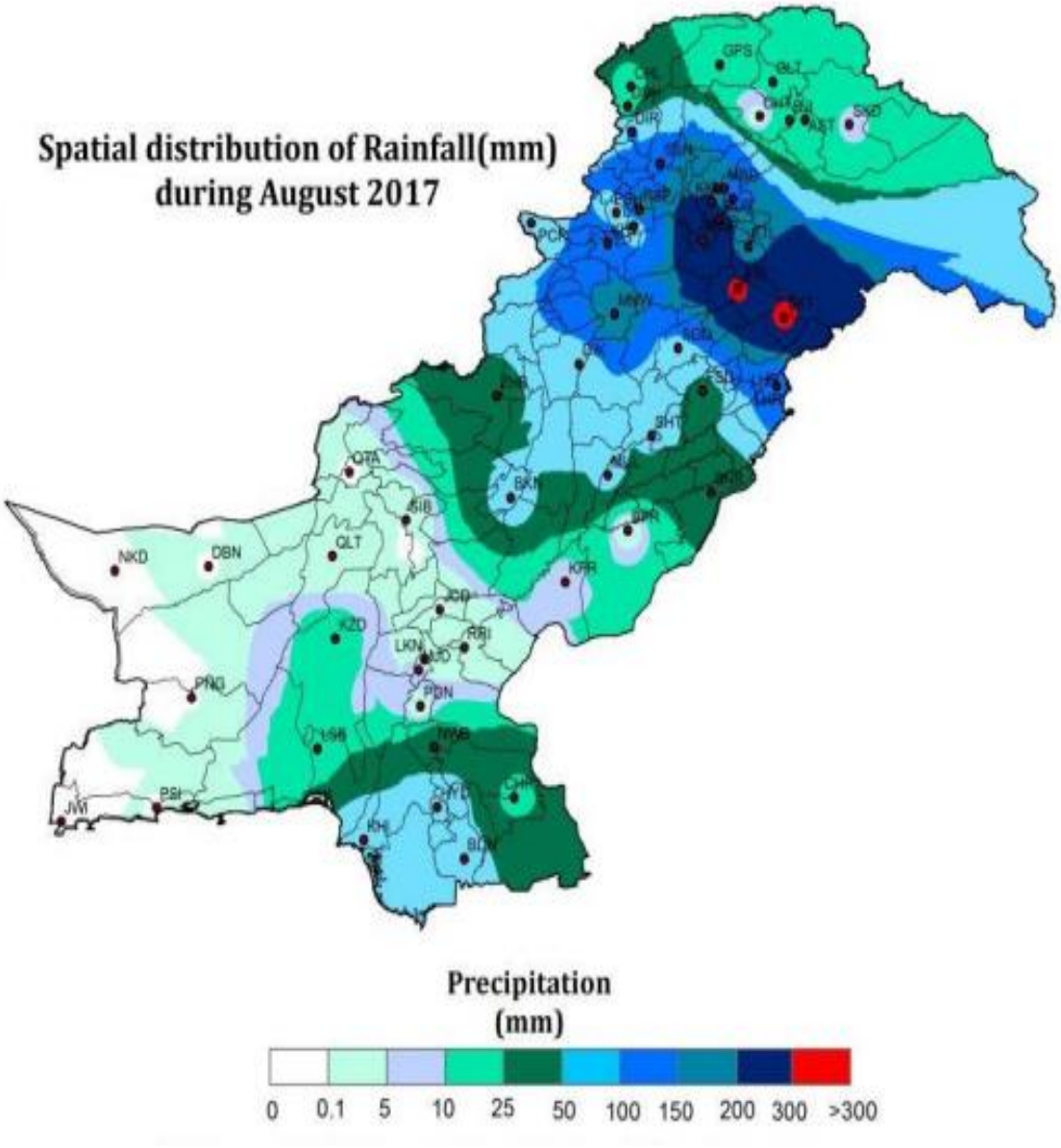


Figure 5: Area weighted (%) rainfall during August 2017

5.3 Country-Wide Losses/ Damages due to 2017 Rains/ Floods

Flood flows triggered by torrential rains affected various parts of country during monsoon season 2017, including four provinces, Gilgit-Baltistan, FATA and some parts of AJ&K. Moderate to heavy downpour in upper catchments of major rivers and their tributaries generated flood flows, which caused losses to human lives and damages to private and public infrastructure. 2017-rains/ floods claimed 172 lives, 167 injured and damaged 440 houses. Province/region wise detail of losses/damages is given in **Table-5**.

5.4 Flood peaks recorded during major historical floods

Highest ever recorded flood peaks during major flood events at various control points of Indus Basin are given in **Table-6**. Flood peaks recorded at important control structures across major rivers during 2017 monsoon season are given in **Table-7**.

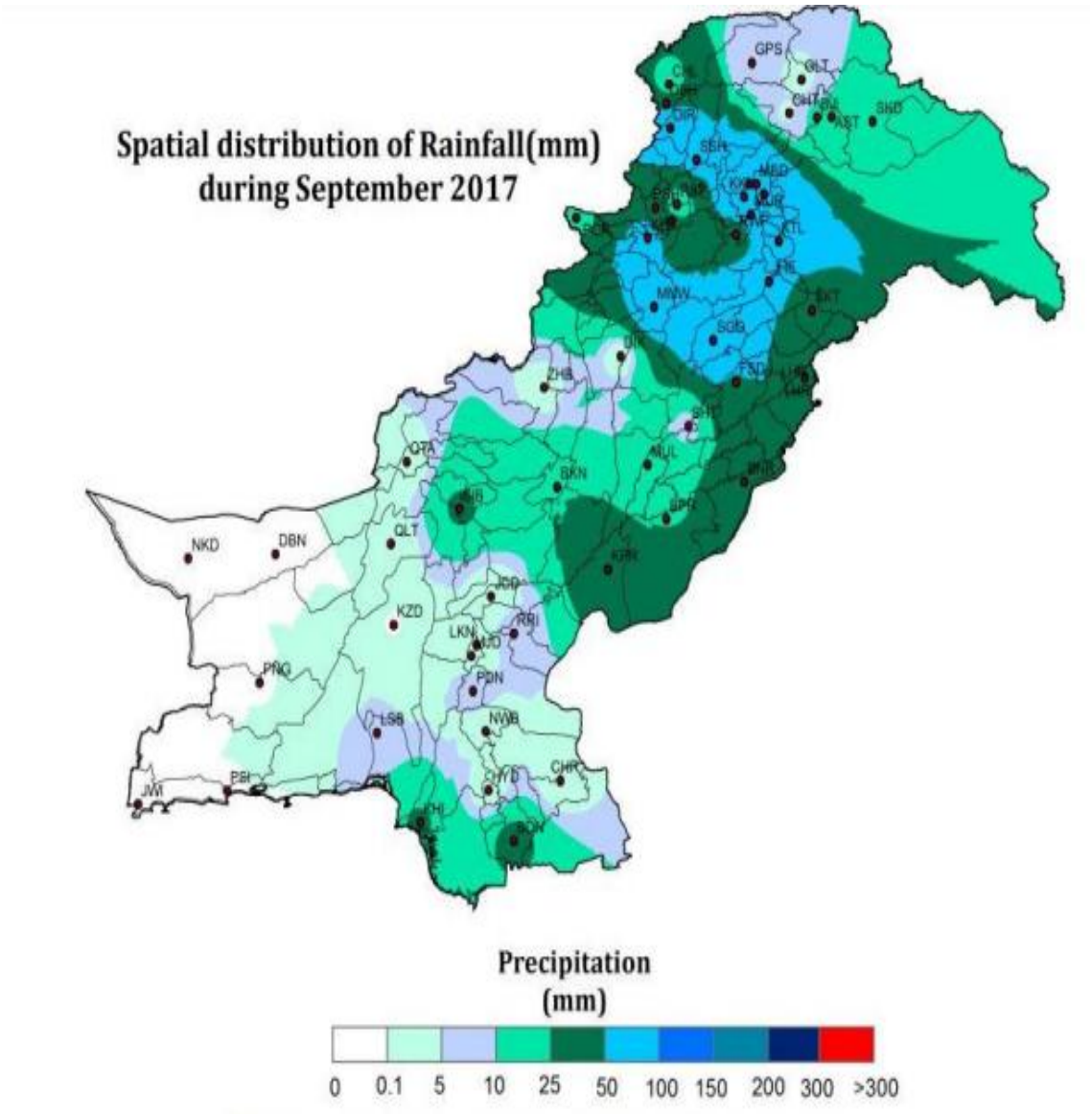


Figure 6: Area weighted (%) rainfall during September 2017

TABLE-5

COUNTRY-WIDE LOSSES/ DAMAGES DUE TO RAIN/FLOOD 2017

Province/ Federal Agency	Persons Died	Persons Injured	Houses Damaged
Punjab	38	83	34
Sindh	38	22	43
KP	28	33	232
Balochistan	26	-	36
AJ & K	13	5	30
G-B	8	4	55
FATA	18	20	9
Islamabad	3	-	1
G. TOTAL	**172**	**167**	**440**

5.5 Infrastructure damages of 2017 Floods and planning for their Rehabilitation

No significant infrastructure damages occurred to flood protection infrastructure in Punjab, Sindh, Khyber Pakhtunkhwa, FATA and AJ&K during monsoon season 2017. However, in Balochistan, flood protection bunds at Patar Colony, Jari Wari, Kundi Wari & Lasbela canal minor were damaged. The restoration cost, as worked out by Irrigation Department, Govt of Balochistan, is Rs 96.00 million.

The protection works for Patar Colony has been taken up under Normal/ Emergent Flood Programme of PSDP 2017-18 and works for Jari Wari, Kundi Wari & Lasbela Canal were being taken up under Provincial ADP. In Gilgit-Baltistan, 45 structures were reportedly damaged having estimated restoration cost of Rs 139.919 million. As one of pre-emptive measures to be taken for next monsoon season 2018 suggested by FFC, Irrigation Department Govt of Balochistan and G-B PWD were advised to complete all restoration works well before start of next monsoon season.

TABLE-6

MAJOR FLOOD EVENTS & HISTORIC FLOOD PEAKS RECORDED IN MAJOR RIVERS *(Continued on next Page)*

Dam/ Barrage Site	Designed Capacity	Highest Recorded		1973 Peak Date	1976 Peak Date	1988 Peak Date	1992 Peak Date	2010 Peak^ Date	2011-Peak^ Date
		Year	Flow (Cusecs)						
Indus River									
Tarbela Reservoir	1,500,000	1929	8,75,000	420,000 July 1973	304,000 3.8.76	556,900 22.7.88	500,000 10.9.92	833,000 30.7.10	272,200 28.6.11
Jinnah Barrage	950,000	1942	950,000	564,000 20.7.73	862,000 2.8.76	598,000 2.8.88	849,245 10.9.92	937,453 30.7.10	293,900 26.7.11
Chashma Barrage	950,000	2010	1,036,700	510,000 22.7.73	787,000 3.8.76	580,000 3.8.88	668,000 11.8.92	1,036,700 1.8.10	356,500 28.7.11
Taunsa Barrage	1,000,000	2010	960,000	568,000 29.7.73	675,000 7.8.76	560,000 21.7.88	655,000 14.9.92	960,000 2.8.10	249,200 31.8.11
Guddu Barrage	1,100,000	1976	1,199,672	1,084,000 18.8.73	1,199,672 15.8.76	1,163,000 30.7.88	1,087,000 18.9.92	1,148,738* 8.8.10	272,300 3.9.11
Sukkur Barrage	900,000	1976	1,161,000	1,077,000 21.8.73	1,161,000 16.8.76	1,116,000 30.7.88	1,068,000 20.9.92	1,130,995** 10.8.10	260,800 6.9.11
Kotri Barrage	875,000	1956	980,000	786,000 Aug 1973	765,000 Aug 1976	649,600 17.8.88	689,300 30.9.92	964,900 27.8.10	261,400 14.9.11
Jhelum River									
Mangla Reservoir	1,230,000	1929	1,100,000	2,20,000 9.8.73	480,060 3.8.76	425,515 16.7.88	1,030,000 10.9.92	344,400 30.7.10	141,300 16.9.11
Rasul Barrage	8,50,000	1929	1,000,000	2,70,000 9.8.73	2,69,000 4.8.76	261,664 17.7.88	952,170 10.9.92	263,796 30.7.10	105,800 17.9.11
Chenab River									
Marala Barrage	1,100,000	1957	1,100,000	770,000 9.8.73	549,000 1.8.76	751,000 25.9.88	845,000 10.9.92	314,378 6.8.10	150,400 16.9.11
Khanki Barrage	8,50,000	1957	1,066,000	1,000,000 10.8.73	615,000 2.8.76	864,000 26.9.88	910,500 10.9.92	334,437 7.8.10	171,400 17.9.11
Qadirabad Barrage	8,07,000	1992	9,48,530	854,000 10.8.73	629,000 2.8.76	892,000 26.9.88	948,530 11.9.92	329,483 7.8.10	171,000 17.9.11
Trimmu Barrage	6,45,000	1959	9,43,000	753,000 12.8.73	706,000 10.8.76	584,000 19.7.88	888,000 14.9.92	328,926 11.8.10	132,900 20.9.11
Panjnad Headworks	7,00,000	1973	8,03,000	803,000 17.8.73	710,000 12.8.76	507,000 27.7.88	744,152 18.08.92	310,117 13.8.10	151,300 24.9.11
Ravi River									
Jassar	275,000	1955	6,86,000	228,000 10.8.73	170,000 9.8.76	582,000 25.9.88	149,000 11.9.92	195,000 23.8.10	27,700 19.9.11
Shahdara	250,000	1988	5,76,000	237,380 11.8.73	170,000 10.8.76	576,000 27.9.88	63,000 12.9.92	41,900 21.8.10	43,000 14.8.11
Balloki Barrage	2,25,000	1988	3,99,000	2,44,000 13.8.73	234,000 11.8.76	399,000 28.9.88	112,157 13.9.92	69,900 23.8.10	72,100 15.8.11
Sidhnai Barrage	1,50,000	1988	3,30,000	2,10,000 18.8.73	244,000 15.8.76	330,000 2.10.88	95,500 16.9.92	27,600 28.7.10	30,300 19.8.11
Sutlej River									
Suleimanki Headworks	3,25,000	1955	5,98,872	177,000 15.8.73	119,000 6.9.76	399,000 30.9.88	197,000 3.9.92	58,300 30.9.10	82,000 29.8.11
Islam Headworks	3,00,000	1955	4,93,000	166,000 17.8.73	111,000 8.9.76	306,000 4.10.88	183,000 7.9.92	31,500 20.9.10	49,600 3.9.11

* It does not include flood flows passed through breaches occurred in LMB Guddu Barrage; ** It does not include flood flows passed through breaches occurred in Tori Flood Bund. ^ Based on the Inflows experienced upstream of the Dam/ Barrage site.

TABLE-6
MAJOR FLOOD EVENTS & HISTORIC FLOOD PEAKS RECORDED IN MAJOR RIVERS

Dam/ Barrage Site	Designed Capacity	Highest Recorded		2012-Peak^ Date	2013-Peak^ Date	2014-Peak^ Date	2015-Peak^ Date	2016-Peak^ Date	2017-Peak	
		Year	Flow (Cusecs)						Inflow/Date	Outflow/Date
Indus River										
Tarbela Reservoir	1,500,000	1929	8,75,000	295,000 4.8.12	392,000 14.8.13	299,000 28-7-2014	486,900 26-7-2015	324,000 17-7-2016	344,000 02-8-2017	336,000 03-08-2017
Jinnah Barrage	950,000	1942	950,000	285,300 18.7.12	479,603 13.8.13	258,000 25-7-2014	532,998 2-8-2015	358,900 05-07-2016	427,460 03-08-2017	419,460 03-08-2017
Chashma Barrage	950,000	2010	1,036,700	298,300 8.7.12	637,482 14.8.13	282,000 17-8-2014	636,512 3-8-2015	396,148 05-07-2016	458,245 05-08-2017	446,361 05-08-2017
Taunsa Barrage	1,000,000	2010	960,000	243,400 10.9.12	516,017 17.8.13	261,000 30-7-2014	604,714 5-8-2015	369,244 07-07-2016	429,861 06-08-2017	423,861 06-09-2017
Guddu Barrage	1,100,000	1976	1,199,672	236,100 12.9.12	567,418 20.8.13	367,000 18-9-2014	769,872 3-8-2015	325,846 11-07-2016	459,811 09-08-2017	428,640 09-08-2017
Sukkur Barrage	900,000	1976	1,161,000	214,800 14.9.12	510,875 24.8.13	321,000 20.9.2014	709,316 5-8-2015	281,515 17-08-2016	390,863 11-08-2017	333,108 11-08-2017
Kotri Barrage	875,000	1956	980,000	166,000 21.9.12	381,696 30.8.13	145,000 25-9-2014	634,919 15-8-2015	173,048 22-08-2016	251,298 18-08-2017	210,923 18-08-2017
Jhelum River										
Mangla Reservoir	1,230,000	1929	1,100,000	1150,00 18.9.12	179,000 13.8.13	634,000 5-9-2014	150,000 12-8-2015	244,000 07-08-2016	94,000 17-07-2017	67,882 22-09-2017
Rasul Barrage	8,50,000	1929	1,000,000	42500 4.8.12	43,080 19.8.13	516,000 6-9-2014	110,100 27-7-2015	57,412 30-08-2016	60,260 22-09-2017	39,230 22-09-2017
Chenab River										
Marala Barrage	1,100,000	1957	1,100,000	183,200 4.8.12	377,290 15.8.13	861,464 6-9-2014	183,431 12-7-2015	412,065 07-08-2016	208,616 18-07-2017	187,472 19-07-2017
Khanki Barrage	8,50,000	1957	1,066,000	194,800 4.8.12	410,331 15.8.13	947,000 7-9-2014	160,000 13-7-2015	418,736 07-08-2016	178,546 03-08-2017	170,021 13-07-2017
Qadirabad Barrage	8,07,000	1992	9,48,530	194,800 5.8.12	407,803 15.8.13	904,000 7-9-2014	174,100 13-7-2015	416,492 08-08-2016	179,842 19-07-2017	157,842 19-07-2017
Trimmu Barrage	6,45,000	1959	9,43,000	87,800 7.8.12	272,609 20.8.13	703,000 10-9-2014	150,865 29-7-2015	166,139 10-08-2016	102,145 05-08-2017	89,345 05-08-2017
Panjnad Headworks	7,00,000	1973	8,03,000	65,600 17.9.12	317,261 28.8.13	454,000 16-9-2014	139,366 30-7-2015	130,829 13-08-2016	78,988 08-08-2017	63,488 08-08-2017
Ravi River										
Jassar	275,000	1955	6,86,000	30,500 26.8.12	67,700 16.8.13	68,000 7-9-2014	32,350 16-7-2015	38,400 08-08-2016	46,319 10-08-2017	46,439 10-08-2017
Shahdara	250,000	1988	5,76,000	40,800 22.8.12	74,880 17.8.13	91,000 8-9-2014	30,000 18-7-2015	44,595 08-08-2016	39,313 02-08-2017	39,313 02-08-2017
Balloki Barrage	2,25,000	1988	3,99,000	60,800 23.8.12	117,770 18.8.13	132,000 9-9-2014	67,180 19-7-2015	60,425 09-08-2016	69,980 11-08-2017	36,790 11-08-2017
Sidhnai Barrage	1,50,000	1988	3,30,000	28,600 14.9.12	87,904 23.8.13	86,000 12-9-2014	43,889 28-7-2015	26,175 01-08-2016	31,967 07-08-2017	26,954 07-08-2017
Sutlej River										
Suleimanki Headworks	3,25,000	1955	5,98,872	21,700 30.8.12	82,370 22.8.13	26,000 7-9-2014	61,421 17-8-2015	32,858 31-08-2016	33,934 13-08-2017	20,893 15-08-2017
Islam Headworks	3,00,000	1955	4,93,000	14,200 13.9.12	70,932 25.8.13	20,000 8-9-2014	45,479 21-8-2015	13,295 31-08-2016	16,971 16-08-2017	14,221 16-08-2017

^ Based on the Inflows experienced upstream of the Dam/ Barrage site.

TABLE-7

FLOOD PEAKS RECORDED DURING 2017 MONSOON SEASON IN MAJOR RIVERS

RIVER	Structure	Peak Inflow (Cusecs)	Retention Date & Time	Peak Outflow (Cusecs)	Flood Stage (based on outflows)	Retention Date & Time
INDUS	Tarbela	344,000	02-08-2017 @ 1200 to 1800 hrs.	336,000	Low Flood	03-08-2017 @ 1200 hrs.
	Kalabagh	427,460	03-08-2017 @ 0600 hrs.	419,460	Medium Flood	03-08-2017 @ 0600 hrs.
	Chashma	458,245	05-08-2017 @ 0600 hrs.	446,361	Medium Flood	05-08-2017 @ 0600 hrs.
	Taunsa	429,861	06-08-2017 @ 1200 hrs.	423,861	Medium Flood	06-09-2017 @ 1200 hrs.
	Guddu	459,811	09-08-2017 @ 1200 to 10-08-2017 @1200	428,640	Medium Flood	09-08-2017 @ 1200 to 10-8-2017 @1200 hrs.
	Sukkur	390,863	11-8-2017 @ 0600 to 12-8-2017 @ 1200 hrs.	333,108	Low Flood	11-08-2017 @ 0600 to 12-8-2017 @1200 hrs.
	Kotri	251,298	18-8-2017 @ 0600 to 1200	210,923	Low Flood	18-08-2017 @ 0600 to 1200 hrs.
KABUL	Nowshera	87,000	12-07-2017 @ 2359 to 13-7-17 @ 1200 hrs.	87,000	Medium Flood	12-07-2017 @ 2359 to 13-7-2017 @ 1200 hrs.
JHELUM	Mangla	94,000	17-07-2017 @ 0600	67,882	Normal	22- 9-2017 @ 1800 hrs.
	Rasul	60,260	22-9-2017 @ 1200	39,230	Normal	22-09-2017 @ 1200 hrs.
CHENAB	Marala	208,616	18-07-2017 @ 2359	187,472	Medium Flood	19-07-2017 @ 0100 hrs.
	Khanki	178,546	03-08-2017 @ 0600	170,021	Medium Flood	13-07-2017 @ 0600 hrs.
	Qadirabad	179,842	19-07-2017 @ 1200	157,842	Medium Flood	19-07-2017 @ 1200 to 1800 hrs.
	Trimmu	102,145	05-08-2017 @ 1200	89,345	Normal	05-08 @ 1200 hrs.
	Panjnad	78,988	08-08-2017 @ 1800 to 9-8-2017 @ 0600	63,488	Normal	08-08-2017 @ 1800 to 10 -08 @ 0600
RAVI	Jassar	46,439	10-08-2017 @ 1200	46,439	Normal	10-08 @ 1200 hrs.
	Shahdara	39,313	02-08-2017 @ 1800 to @2359	39,313	Normal	02-08-2017 @ 1800 to @ 2359 hrs.
	Balloki	69,890	11-08-2017 @ 1800 to @2359	36,790	Normal	11-08-2017 @ 1800 to 12-08-2017 @ 2359 hrs.
	Sidhnai	31,967	07-08-2017 @ 2359 to 8-08 @ 1800	26,954	Normal	07-08-2017 @ 0600 hrs.
SUTLEJ	Suleimanki	33,934	13-08-2017 @ 1800 to 14-08-@1200	20,893	Normal	15-08-2017 @ 0600 to 1200 hrs.
	Islam	16,971	16-8-2017 @ 1800 to 18-08 @ 0600	14,221	Normal	16-8-2017 @ 1800 to 18-08-2017 @ 0600 hrs.

APPENDIX-I

LIST OF FLOOD PROTECTION SCHEMES TAKEN UP UNDER GOP FUNDED NORMAL/EMERGENT FLOOD PROGRAMME DURING FINANACIAL YEAR (2014-15) (2015-16) & (2016-17)

STATUS OF FLOOD PROTECTION SCHEMES BEING IMPLEMENTED UNDER NORMAL/EMERGENT FLOOD PROGRAMME (2014-17)

(Rs in million)

Sr. #	Name of the scheme	Approved Cost Date of Approval	Upto date Expenditure	Status/Physical Progress
I	**PUNJAB**			
1	Construction of J-Head Spur at RD: 20 +000 and Guide Head Spur at RS: 25+000 Magasson Branch, Distt. Muzaffargarh	513.339 19.3.2018	172.908	47% Work in progress
2	Protecting Irrigation System near Head Regulator Bakaini, Area of Bait Daryai Gabbar Arrian from hectic erosive action of Indus River (Revised) Distt. Muzaffargarh	532.440 29-10-2015	426.554	92% Work in progress
3	Construction of J-Head Spur at RD: 15+000 Shehr Sultan Flood Bund (Revised) Distt. Muzaffargarh	179.392 26-12-2013	176.718	100% PC-IV received
4	Construction of spurs on bank of Indus River at Kalur Kot Mallana, Noor Dogar Umarwali Sharif, District Bhakkar	155.656 21-3-2012	111.506	100% PC-IV received
5	Checking erosion on right bank of river Chenab to protect Bhekho Outfall Drain and Agriculture land of Miana Hazzara, District Gujrat	42.499 17-05-2012	37.675	100% PC-IV received
6	Protecting Agricultural land and village abadies of Pakhwal and Tawakal Pakhwal from erosion on Right bank of River Jhelum, District Jhelum	29.246 17-05-2012	30.690	100% PC-IV received
7	Checking Erosive Action of Chenab river of Left Bank near Gangwal, Papin Village u/s Marala Barrage, District Sialkot	171.613 31-03-2015	138.594	96% Work in progress
8	Restoration of J-Head Spur at RD-165+000 of Link No. 1, District D.G. Khan	246.980 20-05-2016	39.324	85% Work in progress
9	Restoration of J-Head Spur at RD-167+000 of Link No. 1, District D.G. Khan	144.950 20-05-2016	56.043	100% PC-IV awaited
10	Checking erosion from RD 458 to 465 Extension Minchin Flood Bund in Dallas Canal Division, Rahimyar Khan	136.906 29.3.2018	Nil	Approved by CDWP on 29.3.2018. Minutes of CDWP meeting are awaited.

11	Extension of existing J-Head Spur at RD 188+000 of Link No. 1, Tehsil Kot Chutta, **District D.G. Khan**	133.597 29.3.2018	Nil	Approved by CDWP on 29.3.2018. Minutes of CDWP meeting are awaited.
		2364.199	**1,190.012**	
II	**SINDH**			
1	Raising/strengthening, providing stone pitching along F.P bund RD 169 to 263.5 & RD 502 to 120, District Kambar, Shahdad Kot, Larkana, Dadu, Jamshoro	492.236 1-3-2008	281.693	90% Work capped-Subjudice
2	Raising/strengthening providing stone pitching along Suprio bund RD 0 to 95 District Kambar, Shahdad Kot, Larkana, Dadu, Jamshoro	253.181 12-1-2008	238.044	100% PC-IV awaited
3	Extension of stone apron & pitching along K.K bund mile 11/3 to 12/4 and recoupment of damage stone apron and pitching from mile 10/7+500 to 11/1+110 District Kashmore	234.549 30-4-2009	222.898	80% Work capped-Subjudice
4	Rehabilitation of Short/Spur Stud along Sukkur Begari Bund mile 0/0 to 0/3 Vulnerable Point, District Sukkar	54.987 8-4-2014	60.429	100% PC-IV awaited
5	Providing stone pitching along Qadirpur Bund mile from 10/4 to 12/4, District Ghotki	44.667 8-4-2014	51.216	100% PC-IV awaited
6	Constructing stone pitching along K.K Link Bund Mile 0/0 to 0/4 and Restoration of stone apron mile 1/1+110 to 1/2 + 220, District Kashmore	38.678 7-3-2014	43.922	100% PC-IV awaited
7	R&S along U/S Right Marginal bund from mile 0/0 to 5/4 & U/S Right spur Bund mile 0/0 to 3/0, District Kashmore	57.029 13-03-2015	57.522	100% PC-IV awaited
8	Providing Stone Pitching and Stone Apron along Sukkur Begari Bund mile 0/3 to 2/0 Vulnerable Point City, District Sukkur.	127.084 21-12-2015	135.202	100% PC-IV awaited
9	Providing Stone Apron along Qadirpur Loop Bund mile 4/6 to 5/0, District Ghotki	32.274 07-01-2016	18.564	100% PC-IV awaited
10	Providing Stone Pitching along Baiji Bund from mile 2/4 to 3/4 and 7/4 to 8/4, District Ghotki	58.423 07-01-2016	39.678	99% Substantially completed
11	Closing breach mile 1/1 to 2/6 Qadirpur Shank Bund, Shank project mile 0/0 to 0/3, Raising & Strengthening mile 0/0 to 1/2 Qadirpur Bund, Qadirpur Shank Bund mile 1/7 2/6 Qadirpur Shank Bund and Shank Projection mile 0/0 to 0/3 R/S (Breach Portion), District Ghotki	259.112 11/2/2016	176.576	100% PC-IV awaited
12	Construction of Stone Pitching, Stone Apron & earthwork along SM Bund mile 4/0 to 4/2 in Rohri Division Kandiaro, District Khairpur	59.737 04-05-2016	67.847	100% PC-IV awaited

13	Providing Stone Apron, Stone Pitching and earthwork along Moria Loop Bund mile 0/0 to 1/0 in Northern Dadu **Division Larkana.**	201.110 4/8/2016	90.508	93% Work in progress
14	Providing Stone Apron along Qadirpur Bund mile 10/4 to 11/4 **(District Ghotki)**.	160.000 4/8/2016	27.784	87% Work in progress
	Sindh Total	**2,073.067**	**1,511.883**	
III	**KHYBER PAKHTUNKHWA (KP)**			
1	Construction of Flood Protection Structure at critical locations in different Nullahs in District Peshawar and Nowshera.	30.000 13-03-2015	30.530	100% PC-IV awaited
2	Construction of Flood Protection Structure at critical locations in District Charsadda.	7.000 13-03-2015	7.373	100% PC-IV awaited
3	Construction of Flood Protection Structure at critical locations in different Nullahs in District Swat.	19.868 04-05-2015	16.242	95% Work in progress
4	Construction of Flood Protection Structure at critical locations in different Nullahs in District Abbottabad and Mansehra.	10.000 04-05-2015	8.654	68% Work in progress
5	Construction of Flood Protection Structure at critical locations in different Nullahs in District Kohat & Karak.	9.630 13-03-2015	6.900	100% PC-IV received
6	Construction of Flood Protection Structure at critical locations in different Nullahs in Districts Bannu & Lakki Marwat.	12.500 04-05-2015	12.500	100% PC-IV awaited
7	Construction of Flood Protection Structure at village Kala on Badri Nullah District Swabi.	6.106 13-03-2015	6.106	100% PC-IV awaited
8	Construction of flood protection schemes for the protection of Dheri Village Distt. Malakand on Dheri Julagram Nullah, District Malakand	10.840 13-03-2015	8.089	100% PC-IV awaited
9	Construction of Flood Protection Bund for protection of village Yark in Takwara nullah District D.I. Khan	20.820 03-02-2017	21.800	100% PC-IV awaited
10	Providing flood protection works in Kurram River District Bannu	10.000 12-05-2016	8.500	100% PC-IV awaited
11	Providing flood protection works in different Nullahs, District Lakki Marwat	16.000 12-05-2016	10.843	100% PC-IV awaited
12	Construction of flood protection works for protection of village abadies and agriculture land on Pir Khel Totakan Khawar	6.000 12-05-2016	4.045	100% PC-IV awaited
13	Extension of existing flood protection work on left bank of Kalpani Nullah to protect village abadies and agriculture land and lift Irrigation schemes near Mayar Village, District Mardan	7.000 03-02-2017	7.000	100% PC-IV awaited
14	Extension of existing flood protection work for the protection work of agriculture land & graveyard in Toru area, District Mardan	7.000 12-05-2016	7.000	100% PC-IV awaited

15	Construction of flood protection works in Ayyan, Jaghur Kuru and Shoghore area, District Chitral	9.952 03-02-2017	7.557	100% PC-IV awaited
16	Construction of flood protection works along Siran River near Malik Pur village, District Mansehra, Haro River Check Kamal Pur U/C Hattar District Haripur and Indus River (left side) village Jammu Ghazi Area, **District Haripur.**	7.000 12-05-2016	7.000	100% PC-IV awaited
17	Construction of flood protection work at Sawal Dher Bakrai Khpa, District Mardan	7.000 03-02-2017	1.068	100% PC-IV awaited
18	Construction of flood protection wall along Punjpir Madarassa & village on left Bank of Badri Nullah, District Swabi	7.000 12-05-2016	7.000	100% PC-IV awaited
19	Providing flood protection works in different Nullahs in District Dir (Lower)	10.000 12-05-2016	9.439	100% Work in progress
20	Construction of flood Protection work for protection of agricultural lands & abadies of Qasim Khan Takht Khel and other areas from flood flows in Khaisoor Nullah, **District Bannu**	15.000 03-02-2017	4.077	Completed PC-IV awaited
21	Construction of Flood Embankment Protection works for protection of village abadies near village Khanay Bakka Khel and adjoining agriculture lands from flood flows in Tochi River, **District Bannu**	10.000 7-3-2018	Nil	Approved by DDWP in its meeting held on 7.3.2018
22	Construction of Nazif spur on R/S of Kurram river, **District Bannu**	7.135 3.2.2017	8.127	Completed PC-IV awaited
23	Construction of Flood Protection Work at critical locations along Bumburate Gole **District Chitral.**	17.300 03-02-2017	13.930	93% Work in progress
24	Construction of Flood Protection work along Bullar Nullah for the protection of Daulat Minor, Mardan Dobian Road and village Kandar **District Mardan**	10.000 03-02-2017	Nil	Work in progress
	KP total (i & ii)	**273.151**	**213.780**	
IV	**BALOCHISTAN**			
1	Flood Protection Bund of Shahool at Mouza Drazi Dureji area Hub River, Lasbela	2.500 13-03-2015	2.500	100% PC-IV awaited
2	Flood Protection Bund along Nehaar River okra area for Agricultural Lands and Abadies of village Haji Ali Bakhsh Shahwani, Lasbela	2.000 13-03-2015	2.000	100% PC-IV awaited
3	Flood Protection Bund along Kundi Wari Dhora Tehsil Hub of Agricultural Lands, Lasbela	2.000 13-03-2015	2.000	100% PC-IV awaited
4	Flood Protection Wall Mastung Town.	2.500 13-03-2015	2.500	100% PC-IV awaited
5	Flood Protection Bund, Sing Sulahi, Kalat	2.500 13-03-2015	2.500	100% PC-IV awaited
6	Flood Protection Bund Kheson Don, Kalat	2.500 13-03-2015	2.500	100% PC-IV awaited
7	Flood Protection Bund for Agriculture Lands of Mir Mohammad Ayoub and others Allah Dumb area Nal, Khuzdar	2.000 13-03-2015	2.000	100% PC-IV awaited

8	Flood Protection Bund for Agriculture Lands of Kundi Umrani village Tehsil Jhao, Awaran	2.000 13-03-2015	1.164	100% PC-IV awaited
9	Flood Protection Bund Kharan Town along Kullan River, Kharan	2.500 13-03-2015	2.500	100% PC-IV awaited
10	Construction of Flood Protection Mirani Kaur Jusak, Kech	2.000 13-03-2015	2.000	100% PC-IV awaited
11	Flood Protection works of Agricultural Lands of Killi Aslam Mehnaz, Bit Buleda, Kech	1.987 13-03-2015	1.987	100% PC-IV awaited
12	Flood Protection Bund at Killi Haji Muhammad Azim Sabrap, Panjgor	2.000 13-03-2015	2.000	100% PC-IV awaited
13	Flood Protection Wall (Killi Kareem Jan) old Poultry Farm Chitkan, Panjgoor	2.500 13-03-2015	2.500	100% PC-IV awaited
14	Flood Protection of water Supply scheme Ormara Town and Navy Base, Gawadar	5.000 13-03-2015	4.792	100% PC-IV awaited
15	PC-I/Estimate for	**3.000**	**3.000**	
i.	Flood Protection of Zinda Pir area village Haji Hussain	13-03-2015	2.000	100% PC-IV awaited
ii.	Flood Protection wall Khudaidad and other Khost area, District Harnai	13-03-2015	1.000	100% PC-IV awaited
16	PC-I/Estimate for	**8.500**	**8.500**	
i.	Flood Protection of PCC Wall Meharbzai Nooruddin Bazai Aghberg Area, Quetta	2.000 13-03-2015	2.000	100% PC-IV awaited
ii.	Flood Protection Bund/wall at Hazara Town	2.000 13-03-2015	2.000	100% PC-IV awaited
iii.	Flood Protection of Agricultural land and grave yard Nohisar area, Quetta	2.500 13-03-2015	2.500	100% PC-IV awaited
iv.	Flood Protection of Mashwani Town Punjpai, Quetta	2.000 13-03-2015	2.000	100% PC-IV awaited
17	Construction of 1 No. Spur for Flood Protection of Trehar Village, District Sibbi	2.000 13-03-2015	NR	100% PC-IV awaited
18	PC-I/Estimate for	**4.000**	**4.000**	
i.	Flood Protection Bund Kachhi Khachar Gurgoi Druq, Musa Khel	2.000 13-03-2015	2.000	100% PC-IV awaited
ii.	Flood Protection Bund for Killi Sardar Raza Khan, Musa Khel	2.000 13-03-2015	2.000	100% PC-IV awaited
19	Flood Protection Work of Chotair area Ziarat & Orchards Malik Lal Mohammad & Malik Lal Gul, Ziarat	2.000 13-03-2015	2.000	100% PC-IV awaited
20	Flood Protection for Agricultural Land and houses Killi Yaqoob Karez Suri Mehterzai area District Killa Saifullah	2.000 13-03-2015	2.000	100% PC-IV awaited
21	PC-I/Estimate for	**8.000**	**8.000**	
i.	Flood Protection Works of Killi Nill Ahmed Khan Bostan Pishin	2.000 13-03-2015	2.000	100% PC-IV awaited
ii.	Flood Protection of Lands /Orchards of Haji Abdul Hameed Bazai Koze Kach Rud Mulazai, Pishin	2.000 13-03-2015	2.000	100% PC-IV awaited
iii.	Flood Protection Scheme of Lands/Orchards for Haji Ghulam Murtaza Mara Jalazai Toba Achakzai, Killa Abdullah	2.000 13-03-2015	2.000	100% PC-IV awaited

iv.	Flood Protection of Lands of Machka Manda, District Killa Abdullah	2.000 13-03-2015	2.000	100% PC-IV awaited
22	Flood Protection of Kohlu Town at Various Location at Kohlu	2.000 13-03-2015	2.000	100% PC-IV awaited
23	Construction of 02 Nos. Flood Protection schemes in District Zhob	2.500 13-03-2015	2.500	100% PC-IV awaited
24	Construction of flood protection wall Killi Noroz Khan and others **(District Kohlu)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
25	Umbrella PC-I for: Construction of flood protection wall killi Mohibullah Khan Matyan Malik Gul Jan & others Drug area **(District Musa Khel)**	2.000 12-05-2016	1.120 -	80% Work in progress
26	Umbrella PC-I for:	**3.500**	**3.500**	
i	Construction of flood protection wall for Tayyab Shah Killi Shakan **(District Harnai)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
ii	Construction of flood protection wall of Killi Dargai Zardloo Area **(District Harnai)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
iii	Construction of protection wall for the Khost Bazar **(District Harnai)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
27	Construction of flood protection Bund Maree Sui Area **(District Dera Bugti)**	1.500 12-05-2016	0.853 -	65% Work in progress
28	Umbrella PC-I for:	**2.000**	**1.000**	
i	Construction of flood protection wall for agriculture land of Haji Abdul Raheem Chanali area **(District Loralai)**	1.000 12-05-2016	0 -	35% Work in progress
ii	Flood protection wall killi kach Sodozai Abdul Looni Tehsil Duki **(District Loralai)**	1.000 12-05-2016	1.000 -	70% Work in progress
29	Umbrella PC-I for:	**7.500**	**6.000**	
i	Construction of flood protection walls (Stone Masonry) for the land of Karez Akhwanzada Killi Mughtian Bostan area**(District Pashin)**	1.500 12-05-2016	0 -	35% Work in progress
ii	Construction of flood protection wall for the land of Ameer Jan Orchards/Lands (Surkach) Dilsora, Khanzai area. **(District Pashin)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
iii	Construction of flood protection wall of Malik Rud Mulla Zai area **(District Pashin)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
iv	Construction of flood protection wall for Agriculture land of Dr. Bashir Kakar Kanozai Balozai area Pishin **(District Pashin)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
v	Flood protection work for Agriculture land of Rashid Khan Nasir Killi Nasran Tehsil Bostan **(District Pishin)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
30	Umbrella PC-I for:	**3.500**	**3.500**	
i	Construction of flood protection of Haji Muhammad Din Tareen Darag for protection of houses/agriculture land Kan Bunglow and construction of flood protection works Jangeer Zindra area **(District Ziarat)**	2.000 12-05-2016	2.000 -	100% PC-IV awaited

ii	Construction of flood protection wall for agriculture land of Molvi Ghousdin, Chotair area, **(District Ziarat)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
31	Construction of flood protection wall/Bund for agriculture land of Yahya Khan and Sheri Yar Khan village Zindra District Ziarat	2.000	0.900	52% Work in progress
32	Umbrella PC-I for:	**5.250**	**5.250**	
i	Flood protection wall (for water supply scheme in Tabbai Nohisar) **(District Quetta)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
ii	Flood protection wall in Aghbarg area killi Ghabizai **(District Quetta)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
iii	Flood protection wall in Saraghurgai (for Agriculture lands shair jan Bazai and others) **(District Quetta)** (Cost Rs 1.00 million)	1.000 12-05-2016	1.000 -	100% PC-IV awaited
iv	Flood protection wall in Baleli area (for Agriculture lands Abdul Raziq Khan & others) **(District Quetta)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
v	Construction of flood protection Allah Gul Shamsozai **(District Quetta)**	1.250 12-05-2016	1.250 -	100% PC-IV awaited
33	Umbrella PC-I for:	**4.250**	**3.250**	
i	Construction of flood protection scheme of Taw Wal Killa Nawab Muhammad Khan and Umer Khitab and Khusro Jogezai **(District Killa Saifullah)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
ii	Construction of flood protection wall in Bundat Musazai Murad khan and others **(District Killa Saifullah)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
iii	Flood protection of Agriculture land/Houses of Mohammad Hanif and others Ragha Sultanzai Muslim Bagh area Killa Saifullah **(District Killa Saifullah)**	1.000 12-05-2016	0.000 -	30% Work in progress
iv	Flood Protection of Agriculture land of Killa Mulla Baz Wali Rud Jogezai area **(District Killa Saifullah)**	1.250 12-05-2016	1.250 -	100% PC-IV awaited
34	Construction of flood protection Gabion Wall along Killi Dabari (Ikhlas Khan) Chaman area **(District Killa Abdullah)**	1.500 12-05-2016	0.720 -	65% Work in progress
35	Umbrella PC-I for:	**4.000**	**4.000**	
i	Construction of flood protection Bund for Washuk town **(District Kharan)**	2.000 12-05-2016	2.000	100% PC-IV awaited
ii	Construction of flood protection Bund for Rehmatullah Baloch Bandband **(District Kharan)**	2.000 12-05-2016	2.000	100% PC-IV awaited
36	Umbrella PC-I for:	**5.500**	**5.500**	
i	Construction of flood protection wall Kaftari Jhal Janat Khatoon Baghbana Bajoi area **(District Khuzdar)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
ii	Construction of flood protection Bund for Bulanzer Kehan Zehri **(District Khuzdar)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
iii	Construction of flood protection Bund Killi Khuda Bukhs Khandozai Nal Khuzdar **(District Khuzdar)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited

iv	Construction of flood protection Bund Killi Soorgaz Muhammad Umer Khuzdar **(District Khuzdar)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
37	Umbrella PC-I for:	**3.000**	**1.500**	
i	Flood protection wall for agriculture land/houses in Iskalkoo area **(District Kalat)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
ii	Flood protection wall for agriculture land/houses in Johan area village Haji Muhammad Alam Bungulzai **(District Kalat)**	1.500 12-05-2016	Nil	100% Work completed
38	Umbrella PC-I for:	**3.000**	**3.000**	
i	Flood protection wall Killi Sheikhan **(District Mastung)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
ii	Flood Protection wall for Ispilingi area **(District Mastung)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
39	Umbrella PC-I for:	**2.000**	**2.000**	
i	Construction of flood protection bund Sheenh Lakki Bent in Tehsil Dureji **(District Lasbela)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
ii	Construction of flood protection bund at Main Lasbela Canal Near Minor No. 2 in Sakran Tehsil Hub **(District Lasbela)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
40	Umbrella PC-I for:	**3.000**	**3.000**	
i	Construction of flood protection bund for agriculture land/Houses of Goth Qazi Ghulam Muhammad Bela, **(District Lasbela)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
ii	Construction of flood protection wall for Killi Haji Abdul Hakeem Pirkoh, Bela **(District Lasbela)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
41	Umbrella PC-I for:	**3.500**	**3.500**	
i	Construction of flood protection work Mir Zahoor Ahmed Buladi, Buleda **(District Kech)**	2.000 12-05-2016	2.000 -	100% PC-IV awaited
ii	Construction of flood protection work Ginna Turbat **(District Kech)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
42	Umbrella PC-I for:	**4.000**	**4.000**	
i	Construction of flood protection bund Chitkan Mainwar Gharibabad **(District Panjgoor)**	2.000 12-05-2016	2.000 -	100% PC-IV awaited
ii	Completion of flood protection bund of killi Haji Muhammad Azim Sabzap **(District Panjgoor)** (Phase-II)	2.000 12-05-2016	2.000 -	100% PC-IV awaited
43	Construction of flood protection bund Basool Kaur Ormara, **(District Gwadar)**	2.000 12-05-2016	2.000 -	100% PC-IV awaited
44	Construction of Agha Haroon Flood Protection Bund for Killi Jan Agha **(District Nushki)**	1.500 12-05-2016	1.500 -	100% PC-IV awaited
45	Umbrella PC-I for:	**2.500**	**1.000**	
i	Construction of flood protection Bund for agriculture lands of Sofi Allah Rakha S/o Rasool Bukhsh Kalwar and other Mouza Ganmb Tehsil Bhag **(District Kachhi)**	1.500 12-05-2016	0 -	50% Work in progress

ii	Construction of flood protection Bund around the houses of Killi Darga Sufi Ahmed Faqir Bhag town area **(District Kachhi)**	1.000 12-05-2016	1.000 -	100% PC-IV awaited
46	Construction of flood protection spurs along left bank of Nari River for protection of agricultural lands and abadies of village Malik Muhammad Akhtar and others, **(District Sibbi).**	10.000 03-02-2017	9.198 -	Completed PC-IV awaited
47	Construction of flood protection bund for houses and agricultural lands at Pashtoon Bagh, **(District Quetta)**	2.000 03-02-2017	2.000 -	PC-IV awaited
48	Construction of flood protection bund Sayani Dohra at Muhammad Seyapad Goth Pirkas, Tehsil Hub, **(District Lasbela)**	2.500 03-02-2017	2.500 -	PC-IV awaited
49	Construction of flood protection wall for Gullo Goth Shah Noorani area, Tehsil Wadh, **(District Khuzdar).**	15.000 03-02-2017	8.302 -	80% Work in progress
50	Construction of flood protection PCC wall for agricultural land and houses along Gaitanai Kaur Washbood, **(District Panjgoor)**	2.500 03-02-2017	2.500 -	PC-IV awaited
51	Construction of flood protection wall for agricultural land of village Karmabad along left bank of Sehab River, **(District Loralai)**	2.000 03-02-2017	2.000 -	PC-IV awaited
52	Construction of flood protection of agriculture land of Fateh Muhammad and others of Appozai, **(District Zhob).**	2.000 03-02-2017	2.000 -	PC-IV awaited
53	Construction of flood protection wall for Killi Sikandar abad Dairy Farm area, **(District Kohlu)**	2.000 03-02-2017	1.413 -	80% Work in progress
54	Construction flood protection wall for houses Killi Biber Tak area, **(District Barkhan)**	2.000 03-02-2017	2.000 -	PC-IV awaited
	Balochistan Total	**176.487**	**155.449**	
V	**Gilgit Baltistan**			
1	Construction of flood protective and river training works for Darel / Tangir valley District Diamer.	30.900 05-04-2007	23.315	90% Work in progress
2	Construction of flood protective bund at Sailing (Ph-II) District Ghanche	12.786 16-02-2010	11.619	100% PC-IV awaited
3	Construction of protective bunt at Ghursey (Ph-IV), District Ghanche	24.113 17-05-2012	6.992	65% Work in progress

4	Construction of protective works at Surmo (Phase-III), District Ghanche.	16.428 17-05-2012	11.192	75% Work in progress
5	Construction of flood protection works at Pakora Hoto, District Skardu (Revised)	25.000 04-05-2016	19.000	80% Work in progress
	G-B Total :	**109.227**	**72.118**	
VI	**FATA**			
1	Flood Protection Scheme for Protection of Village abadies & agriculture land of Qabal Khan Kach Kurailia Algad in Pir Tangi Area in FR Tank	5.994 14-2-2013	5.945	100% PC-IV received
2	Flood Protection Scheme for Protection of Umer Shah Kach in Khoi Payer Ustrana Area FR D.I KHAN	4.414 14-2-2013	4.405	100% PC-IV received
3	Construction of Flood Protection Bund for agricultures land and village abadies of Noor Alam kach Shahoor and Dana Wat Algad Sarwakai Tehsil SW Agency	4.523 14-2-2013	4.502	100% PC-IV awaited
4	Construction of Flood Protection Bund for the Protection of land Bahadar khan kach near Khar village in Bajur Agency	3.500 17-5-2012	3.264	100% PC-IV received
5	Flood Protection bund at Kacha Algad Morang Valley FR Lakki	4.000 17-5-2012	3.979	100% PC-IV awaited
6	Flood Protection Bund for Protection of land Waheed Kach Haji Lawang Khawar in Bajur Agency	2.980 17-5-2012	2.979	100% PC-IV received
7	Construction of flood protection scheme of Nazar Jan S/o Ghazi Marjan village Mangleen Area, F.R. Tank	5.294 17-5-2012	5.559	100% PC-IV awaited
8	Construction of Flood Protection works for the safety of village abadies and culturable land of Manri Kanri (Saif-ur-Rehman Kach) Tehsil Sararogha SWA	5.944 13-10-2009	5.921	100% PC-IV awaited
9	Flood Protection Schemes for the protection of cultural land & village abadies of Umer Kach Sada Tehsil Kurram Agency.	3.500 17-5-2012	3.468	100% PC-IV received
10	Flood Protection scheme for Gawako Khawar insadda Kurram Agency	2.990 17-05-2012	2.917	100% PC-IV received
11	Construction of Flood Protection Bund for the land of Bakhta Jan Kach Ping Area FR Tank	2.751 17-05-2012	2.740 -	100% PC-IV awaited
12	Construction of flood protection bund for the protection of Agriculture land of L/R sides of Dhana Algad in Sholam Birmal Tehsil SWA	4.933 7-01-2016	4.906	Completed PC-IV awaited

13	Construction of flood protection bund at Zam kach Bangi Wala (Liaquat Ali Kach) Tehsil Sararogha, SWA	6.000 7-01-2016	4.755	Completed PC-IV awaited
14	Construction of flood protection bund for the protection of land of Gulistan kach on tank Zam Algad Sobati area in FR Tank	6.934 7-01-2016	6.899	100% PC-IV received
15	Construction of flood protection bund for the protection of Zaido Kach on R/S of Shuza Algad in FR Tank	6.689 7-01-2016	6.649	100% PC-IV received
16	Construction of flood protection bund for the protection of land of Pir Zaman kach on R/S of Tank Zam Algad in FR Tank	7.203 7-01-2016	6.918	100% PC-IV received
17	Construction of flood protection bund for the protection of land & village abadies of Mir Azam kach on matakar Algad in FR Tank	7.112 7-01-2016	7.067	100% PC-IV received
18	Construction of flood protection bund for the protection of agriculture land of Abdul Qayyum and Hasti Khan Kach in Ustarana area in FR DI Khan	6.862 7-01-2016	6.801	Completed PC-IV received
19	Flood protection scheme Raza Kach on Kurram River Shewa Tehsil **North Waziristan Agency**	6.500 03-02-2017	2.200	Completed PC-IV awaited
20	Flood scheme in **Kurram agency:**			
i. ii.	FPW at Agra Kirman Toi upper Kurram FPW at Tauda China lower Kurram	6.000 03-02-2017	N.R	Work reportedly not yet started
21	Construction of flood protection bund for protecting land/ Inayat-Ur-Rehman Kach on Tank Zam**, South Waziristan Agency**	7.357 03-02-2017	3.800	Completed PC-IV awaited
22	Construction of flood protection bund for protection of land of Sher Jan Kach, Noor Gul Kach and Niazam Gul Kach on Gull Algad in Sherani area, **FR D.I.KHAN**	7.359 03-02-2017	-	Completed PC-IV awaited
23	Construction of flood protection bund for protecting land of Anwar Kach on Local Algad in Sherani Area **F.R D.I.KHAN**	6.170 03-02-2017	-	Completed PC-IV awaited
24	Flood protection scheme for the land of Asghar & Molvi Rashid Kach in KAZA Nar near Torwan area, Torwan Bridges in Tiarza **Tehsil South Waziristan Agency**.	8.000 03-02-2017	-	Completed PC-IV awaited
25	Construction of flood protection bund for protecting land of Tairza Khullah algad, Tehsil Wana, **South Waziristan Agency**	3.900 03-02-2017	-	Deferred by S.C. on 3.4.2017. FATA was directed to submit ADSC clearance. Response awaited
26	Construction of flood protection bund for protection of land of Gahazai Payaza, Tehsil Wana **South Waziristan Agency**	4.092 03-02-2017	-	
27	Flood protection scheme at Ashraf Khel, WANA, **South Waziristan Agency**	4.841 03-02-2017	-	
	FATA Total	**145.842**	**95.674**	

VII	**AJ&K**			
1	Protecting & Checking of Erosion Against flood on River Kunhar Brarkot Distt. Muzaffarabad (Revised)	18.652 04-05-2015	18.652	100% PC-IV awaited
2	Restoration of flood damages for protection of strategic installation at Iftikharabad on right bank of river Munawar Tawi, District Bhimber	59.005 24-06-2014	31.877 -	60% Work in progress
3	Protecting and Checking of Erosion against flood on River and left bank of River Poonch at Buttle and Mondhole District Poonch	14.096	12.741	90% Work in progress
4	Construction of guide wall for protection of Khandaq right to Munawar forward situated along right bank of river Munawar Tawi, District Bhimber	108.622 3/5/2017	Nil	Approved by CDWP on 03.05.2017. Work pending for want of funds
5	Extension of existing flood protection structures at Brarkot left Bank of River Kunhar.	15.761 Under approval	Nil	On agenda of next S.C. meeting of FFC scheduled for 11th April 2018.
	AJK total:	**205.355**	**63.270**	
	Grand Total	**5,347.328**	**3,302.186**	

LIST OF FLOOD PROTECTION SCHEMES TO BE FINANCED UNDER NORMAL/EMERGENT FLOOD PROGRAM FOR FINANCIAL YEAR (2017-18)

(Rs in million)

Sr. #	Name of Scheme	Estimated Cost Approval date	Upto date Expenditure (31-12-2017)	Physical Progress (%age)	Remarks
I	**PUNJAB**				
1	Extension of existing J-Head Spur at RD 188+000 of Link No. 1, Tehsil Kot Chutta, District D.G. Khan	133.597 29.3.2018	Nil		PC-I approved by CDWP on 29.3.2018. Minutes awaited
	Checking erosion from RD 458 to 465 Extension Minchin Flood Bund in Dallas Canal Division, Rahimyar Khan	136.906 29.3.2018	Nil		PC-I approved by CDWP on 29.3.2018. Minutes awaited
3	Checking erosive action of River Chenab near Shakar Kot and Randhir Khokhran Villages along right bank of river Chenab.	17.552	-	-	PC-I under process of vetting with M/s NESPAK.
4	Construction of 09 No. stone stud to protect villages and abadies (Manjotha, Swang, Sasti and Sangi) from flood flows of Sanghar Hill Torrents.	55.431	-	-	Approved by DDWP on 70.3.2018.
5	Construction of diversion structures on River Jhelum near Gaga Village tehsil Bhera	15.070	-	-	Under process for DDWP's approval
	Total:	**483.473**			
II	**SINDH (Carry forward from previous year)**				
1	Providing stone apron along Qadirpur loop bund mile 4/6 to 5/0	32.274 7/01/2016	18.564	100%	Completed
2	Providing stone pitching along Baiji bund from mile 2/4 to 3/4 and 7/4 to 8/4	58.423 7/01/2016	39.678	99%	Completed
3	Proposal for closing breach mile 1/1 to 2/6 Qadirpur Shank Bund, Shank Projection mile 0/o to 0/3, raising & strengthening mile	259.112	176.576	100%	Completed

	0/0 to 1/2 Qadirpur bund, Qadirpur Shank bund mile 0/0 to 1/7 and providing stone pitching mile 1/7 to 2/6 Qadirpur Shank bund and Shank Projection mile 0/0 to 0/3 R/s (Breach Portion)	11/02/2016			
4	Providing stone apron, stone pitching 4 No. stone studs and earthwork along Moria Loop bund mile 0/0 to 1/0 in northern Dadu Division, Larkana	201.110 4/08/2016	90.508	93%	Work in progress
5	Providing stone apron along Qadirpur loop bund mile 10/4 to 11/4	160.000 4/08/2016	27.784	87%	Work in progress
	Total:	**710.919**	**353.110**		
III.	**KHYBER PAKHTUNKHWA**				
1	Construction of flood protection work along Chital River at Green Lasht & Roshun **District Chitral**	13.498	-	-	Under process for approval by DDWP
2	Construction of flood protection work on right side of Ismaila Nullah in Ismaila Village **District Swabi**	8.663	-	-	Approved by DDWP on 7.3.2018
3	Construction of flood protection bund for the protection of village abadies of Yarik U/S & D/S of NHA Road in Takwara Nullah **District D.I. Khan**	4.800	-	-	Approved by DDWP on 7.3.2018
4	Construction of flood protection bund for the protection of village Shero (Sabz Ali Khan Koroona) Panyala Area **District D.I. Khan**	4.500	-	-	Approved by DDWP on 7.3.2018
5	Flood protection work for protection of village abadies & agriculture lands of Kotka Malakan village Mama Khel Wali Noor Jani Khel form Ghundaki Algada & Zafer Ali Khan Junai baka Khel from Tochi River in **District Bannu**	9.76	-	-	Approved by DDWP on 7.3.2018

6	Construction of flood protection work for the protection of agriculture land along right bank & protection of Lodhi Khel Channel along left bank of Khanki Toi & Shahu Bazar, District Hangu	6.830	-	-	Under process for approval of DDWP
7	Construction of flood protection work for the protection of land & abadies from flood flows in Varmola & Nugram Nullah in **District Lakki Marwat**	5.000	-	-	Approved by DDWP on 7.3.2018
8	Construction of flood protection work at Shamoon Kali Shargah **District Mardan**	3.000	-	-	PC-I deferred by S.C of FFC
9	Construction of protection bund in WANDA, Zalo and Malagan, **Tehsil & District Tank.**	5.900	-	-	Approved by DDWP on 7.3.2018
	Total:	**67.600**			
IV.	**BALOCHISTAN**				
1	construction of flood protection for Patar Colony at Hub, **District Lasbela**	39.600	Nil	Nil	* Scheme cleared in the S.C. meeting held on 04-01-2018 * Modified PC-I awaited.
	Total:	**39.600**			
V.	**GILGIT-BALTISTAN**				
1	Construction of flood protective and river training works for Darel / Tangir valley, **District Diamer.**	30.900 5/4/2007	23.315	90%	Work in progress
2	Construction of flood protective bund at Sailing (Ph-II), **District Ghanche**	12.786 16/2/2010	11.619	100%	* Work completed * PC-IV awaited
3	Construction of protective bunt at Ghursey (Ph-IV), **District Ghanche**	24.113 17/5/2012	6.992	65%	Work in progress
4	Construction of protective works at Surmo (Phase-III), **District Ghanche**.	16.428 17/5/2012	11.192	75%	Work in progress
5	Construction of flood protection works at Pakora Hoto, **District Skardu** (Revised)	25.000 4/5/2016	19.000	80%	Work in progress
	Total (GB)	**109.227**	**72.118**		

VI.	**FATA**				
1	Construction of flood protection bund at Zam Kach Bangi wala (Liaquat Ali Kach) Tehsil Sararogha **South Waziristan Agency**	6.000 07-01-2016	4.755	100%	* Physically Completed * PC-IV received
2	Construction of flood protection bund for protection of land of Inayat-Ur-Rehman Kach on Tank Zam, **South Waziristan Agency**	7.357 03-02-2017	3.800	100%	* Physically Completed * PC-IV awaited
3	Construction of flood protection bund for protection of land of Sher Jan Kach, Noor Gul kach and Niazam Gul Kach on Gatt Algad in Sherani Area, **F.R. D.I. Khan**	7.359 03-02-2017	Nil	100%	* Physically Completed * PC-IV awaited
4	Construction of flood protection bund for protection of land of Anwar kach on local Algad in Sherani Area **F.R. D.I Khan**	6.170 03-02-2017	Nil	100%	* Physically Completed * PC-IV awaited
5	Construction of flood protection scheme for the land of Asghar & Mulvi Rashid kach in KAZA Nar near Torwam Area/land near Torwam Bridges in Tiarza Tehsil **South Waziristan Agency**	8.000 03-02-2017	Nil	100%	* Physically Completed * PC-IV awaited
6	Flood protection schemes Raza kach on Kurram River Shewa Tehsil **North Waziristan Agency**	6.500 03-02-2017	2.200	100%	* Physically Completed * PC-IV awaited
7	Flood Protection schemes in **Kurram Agency**	6.000 03-02-2017	Nil	-	N.R
8	Construction of flood protection wall for the protection of land of Washil Shah, Habib Shaha Bismillah Jan, Ajab Shah Kach on R/L of Tangi Algad Majeed Kach on Saraghazai Khuwara in Sherani Area **F.R. D.I. Khan**	21.535 Under process for approval	-	-	* Scheme cleared by Scrutinizing Committee meeting on 10-05-2017. * Modified PC-I sent to M/o Water Resources on 8-01-2018.
9	construction of flood protection bund for the protection of land of Ashraf Kach, Khari Din Kach on R/L side of Landai Khuwara Spina Tangai Kach on R/L side of Spina Tangai Khuwara in Sherani Area **FR D.I. Khan**	21.673 Under process for approval	-	-	* Scheme cleared by Scrutinizing Committee meeting on 10-05-2017. * Modified PC-I sent to M/o Water Resources on 8-01-2018.

10	Construction of Flood protection wall for the protection of Land Bakhta Khan on left side of Tank Zar Algad, Pir Zaman Kach on R/Side of Shuza Khullah Algad in FR Tank	20.418 Under process for approval	-	-	* Scheme cleared by Scrutinizing Committee meeting on 10-05-2017. * Modified PC-I sent to M/o Water Resources on 8-01-2018.
	Total (FATA)	**111.012**	**10.755**		
VII.	**AJ&K**				
1	Extension of existing flood protection structures at Barakot left Bank of River Kunhar.	15.761	-	-	S.C. of FFC cleared the scheme during its meeting held on 18-10-2017 subject to compliance of certain observations. Modified PC-I will be reconsidered by S.C of FFC during its next meeting.
2	Flood Protection Works along right and left bank of Rangar Nullah Abbas Pur Tributary of River Poonch	15.000	-	-	Site survey under process
3	Flood Protection Works left bank of Ranger Nullah Abbas Pur District Poonch	10.000	-	-	Site survey under process
	Total:	**29.980**			
	Grand Total:	**1,551.811**	**435.983**		

Appendix-II

MAJOR RIVERS FLOW DATA OF MONSOON SEASON 2017

Discharge in Cusec

DATE	TIME	INDUS			Kabul	INDUS						
		TARBELA			Nowshera	KALABAGH		CHASHMA			TAUNSA	
		Reservoir Level (Ft)	U/S	D/S	Flow	U/S	D/S	Reservoir Level (Ft)	U/S	D/S	U/S	D/S
1-Jul-17	0600	1466.55	242500	140000	58600	176200	168700	648.40	245000	219000	205300	180500
2-Jul-**17**	0600	1470.31	219800	140900	49400	203000	195000	647.50	211500	219000	203200	176200
3-Jul-**17**	0600	1473.60	210800	140000	48800	166400	158600	646.60	210100	219000	203400	178900
4-Jul-**17**	0600	1475.76	201800	155000	46300	178600	170800	645.40	193300	205000	202400	178400
5-Jul-**17**	0600	1477.38	203300	168000	47200	177600	169600	644.40	203500	210000	200700	179800
6-Jul-**17**	0600	1478.45	203600	180000	43300	229500	221500	642.60	211400	225000	190500	170300
7-Jul-**17**	0600	1479.25	201000	183200	39500	207300	199300	643.70	250200	232000	206200	183200
8-Jul-**17**	0600	1479.42	189400	185000	38400	237500	229500	642.80	228400	232000	227900	204400
9-Jul-**17**	0600	1479.59	190600	186200	38100	210200	202200	643.30	243600	232000	212700	187900
10-Jul-**17**	0600	1479.90	203100	195700	41200	234100	226100	642.40	228700	232000	215800	191000
11-Jul-**17**	0600	1481.64	233600	194500	44300	238700	230700	643.60	251200	232000	216300	191000
12-Jul-**17**	0600	1485.64	264100	175000	56300	243600	235600	644.10	252100	240000	212700	184200
13-Jul-**17**	0600	1490.40	281300	175000	86800	234700	227200	645.40	268100	245000	217000	190500
14-Jul-**17**	0600	1496.80	291800	143500	68200	268600	261100	646.40	266100	245000	224400	197400
15-Jul-**17**	0600	1502.58	281900	145000	61200	201600	193800	647.00	261000	245000	228000	200000
16-Jul-**17**	0600	1507.10	256700	146000	57400	234900	227100	644.60	216100	245000	225200	201500
17-Jul-**17**	0600	1511.37	270900	165000	58400	181300	173500	645.30	240600	225000	225000	203500
18-Jul-**17**	0600	1514.34	278000	202500	56100	226700	218900	643.80	212800	225000	216300	194800
19-Jul-**17**	0600	1517.37	293800	217300	55900	279600	271800	643.40	252000	250000	208600	188000
20-Jul-**17**	0600	1520.00	270800	203700	52200	265800	258000	643.70	286500	276700	207900	186700
21-Jul-**17**	0600	1521.00	256300	229000	47400	227100	219400	643.40	274400	271200	244700	226500
22-Jul-**17**	0600	1522.00	245500	219000	49200	305400	297600	645.60	253800	220000	260100	238600
23-Jul-**17**	0600	1523.00	248600	222100	46800	262600	254800	648.50	281000	220000	235000	213000
24-Jul-**17**	0600	1524.00	255100	228600	49600	284800	277000	648.30	266600	265000	211000	189000
25-Jul-**17**	0600	1525.00	253200	226400	46600	273300	265500	648.50	293600	282200	230900	209100
26-Jul-**17**	0600	1526.00	253500	227000	45400	287200	279200	648.50	287500	281000	249100	227100
27-Jul-**17**	0600	1527.00	246600	220100	43300	261900	253900	648.50	290700	284700	266900	244900
28-Jul-**17**	0600	1528.00	244000	217500	41700	301300	293300	648.50	291300	284900	269000	246700
29-Jul-**17**	0600	1529.00	255000	228500	41900	271100	263100	648.50	298200	291800	267600	245300
30-Jul-**17**	0600	1530.00	267500	241000	46000	282600	274600	647.50	284059	300000	276500	252300
31-Jul-**17**	0600	1531.00	302200	274600	49400	303700	295500	646.90	294700	300000	275800	253500

Discharge in Cusecs

DATE	INDUS						JHELUM				
	GUDDU		SUKKAR		KOTRI		MANGLA			RASUL	
	U/S	D/S	U/S	D/S	U/S	D/S	Reservoir Level (Ft)	U/S	D/S	U/S	D/S
1-Jul-17	180300	142200	121900	68400	61700	31900	1198.55	44200	10000	8100	53000
2-Jul-**17**	184800	143500	120400	66500	54100	14200	1199.65	41400	10000	8200	5300
3-Jul-**17**	179400	137900	119400	65100	63700	22400	1200.65	40100	10000	8200	5300
4-Jul-**17**	170800	129600	114200	61700	64600	24100	1201.65	41100	10000	8200	5300
5-Jul-**17**	159700	118800	100100	48700	64600	24100	1202.75	45600	10000	2500	NIL
6-Jul-**17**	169000	128000	100800	48700	62700	22400	1203.75	43000	10000	2600	-
7-Jul-**17**	170400	129200	100800	48700	57900	17800	1204.75	43000	10000	2600	-
8-Jul-**17**	177700	136400	105000	50100	56600	16000	1205.65	39700	10000	2600	-
9-Jul-**17**	181000	139700	116700	60100	55200	14600	1206.45	36400	10000	2600	-
10-Jul-**17**	181000	139700	120000	65100	52000	11300	1207.40	41400	10000	2600	-
11-Jul-**17**	184500	143100	121700	67000	43900	3200	1208.30	39700	10000	2800	-
12-Jul-**17**	187100	148200	126000	71300	43100	2400	1209.70	56200	10000	2800	-
13-Jul-**17**	185900	148200	130200	75600	43100	2400	1211.05	56800	10000	10800	8000
14-Jul-**17**	186200	151400	134200	79500	43900	3200	1212.25	52200	10000	8300	5300
15-Jul-**17**	182900	146300	137600	85100	46200	9900	1213.00	36300	10000	8500	5300
16-Jul-**17**	183100	146300	128100	75600	54600	24100	1213.95	43400	10000	3200	-
17-Jul-**17**	194300	158700	127700	74000	59700	27300	1214.95	45100	10000	8600	5300
18-Jul-**17**	188700	152500	140200	87100	62600	32800	1215.95	45100	10000	8800	5300
19-Jul-**17**	184700	166700	137400	88900	64800	40800	1216.90	43400	10000	8800	5300
20-Jul-**17**	190400	173100	146900	102000	65100	50600	1217.60	34600	10000	8900	5300
21-Jul-**17**	198400	169900	157100	112400	69900	47300	1218.30	34600	10000	9000	5300
22-Jul-**17**	192700	162400	147400	103000	62200	34600	1219.00	34600	10000	9000	5300
23-Jul-**17**	204900	174600	141700	100200	60300	36800	1219.60	31100	10000	3600	NIL
24-Jul-**17**	235400	207100	156700	115200	72300	51700	1220.35	37000	10000	2800	-
25-Jul-**17**	244700	214900	167300	122900	75800	43300	1220.95	32300	10000	10600	8000
26-Jul-**17**	228400	197500	190100	139100	83600	47300	1221.55	32300	10000	8100	5300
27-Jul-**17**	227900	205200	200100	150500	91600	57200	1222.15	32300	10000	2700	NIL
28-Jul-**17**	226400	194800	189400	138000	85700	47300	1223.00	41600	10000	2700	-
29-Jul-**17**	230900	198500	184700	131600	85000	45600	1223.65	34100	10000	2900	-
30-Jul-**17**	241200	211400	188100	135400	95500	61800	1224.35	36000	10000	2700	-
31-Jul-**17**	241700	211400	197900	144100	101300	65500	1225.05	36000	10000	8000	5300

Discharge in Cusecs

DATE	CHENAB								RAVI			
	MARALA		QADIRABAD		TRIMMU		PANJAND		BALLOKI		SIDHNAI	
	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S
1-Jul-17	142900	107900	169700	147700	22300	9000	24400	9100	40200	9200	14000	2600
2-Jul-**17**	84000	49000	76700	54700	29600	16300	22900	7700	40000	8100	15000	2600
3-Jul-**17**	78900	43600	50800	34800	33400	59100	23100	7700	39900	8100	17000	4600
4-Jul-**17**	84200	49000	51700	29700	50100	42500	23100	7700	40200	8100	12300	NIL
5-Jul-**17**	84100	49000	51700	29700	35600	23400	26300	10700	41400	9200	13200	-
6-Jul-**17**	78900	43600	47900	25900	24200	9900	26300	10700	40300	8100	17200	3600
7-Jul-**17**	78900	43600	39200	17200	24400	10500	42900	27300	40300	8100	17200	3600
8-Jul-**17**	79000	43500	31400	9400	24900	10600	37200	21500	39000	15000	17200	3600
9-Jul-**17**	79100	43500	35300	13300	22600	8300	30700	15200	40100	12700	17200	3600
10-Jul-**17**	73900	38100	38000	16000	19300	5000	24600	9100	38000	5800	17400	3600
11-Jul-**17**	95300	59600	46900	24900	10700	NIL	23000	7500	38000	5800	17700	3600
12-Jul-**17**	87100	51500	60900	38900	11900	-	22100	6600	38000	5800	15800	1300
13-Jul-**17**	134900	102000	159300	137300	13000	-	19600	4100	38100	8100	15600	1300
14-Jul-**17**	116700	83600	117200	95200	14400	-	17500	2100	42400	10400	16800	2600
15-Jul-**17**	98400	65300	80300	58300	59600	45200	17500	2100	46100	13800	16600	2000
16-Jul-**17**	98400	65300	54500	32500	63700	49300	18000	2500	50800	18500	17400	2600
17-Jul-**17**	99700	66300	92800	70800	51600	37300	15500	-	48500	16200	19200	4300
18-Jul-**17**	116900	83600	105700	83700	40900	26500	15500	-	43000	10900	20400	5900
19-Jul-**17**	139700	111200	141200	119200	58500	46400	29900	14400	42900	11200	24100	11400
20-Jul-**17**	108600	79000	130600	108600	67500	55000	42200	31200	44400	12700	23800	11400
21-Jul-**17**	92300	60700	65600	43600	87000	74400	42000	28700	48300	16600	21400	8200
22-Jul-**17**	88800	56100	70700	48800	81600	69000	39200	26100	48400	16600	20700	6900
23-Jul-**17**	88800	56100	61000	39000	52200	39600	43000	29200	43000	11200	20800	6900
24-Jul-**17**	79600	46900	68300	46300	40700	28000	61000	46500	43000	11200	23500	9100
25-Jul-**17**	93400	60700	61000	39000	38500	25600	74700	60700	43200	11200	24300	9500
26-Jul-**17**	84200	51500	61000	39000	36400	23400	61500	47500	41700	9400	21800	6600
27-Jul-**17**	88800	56100	61000	39000	34400	21600	51900	37100	41700	9400	19800	4600
28-Jul-**17**	88800	56100	68400	46400	38000	25200	45600	31300	41900	9400	18500	3300
29-Jul-**17**	98000	65300	64700	42700	37000	24200	37200	22200	42800	10300	18500	3300
30-Jul-**17**	93300	60700	84200	65200	32100	19300	31500	16600	42100	9400	17300	2300
31-Jul-**17**	125500	84600	84200	76100	36100	23300	32500	18000	42100	9400	17400	2300

Discharge in Cusec

DATE	SUTLEJ				LINKS/ CANAL				SKARDU	
	SULEMANKI		ISLAM		C.J	CRBC	Q.B	T.P	Temperature ^{0}C	
	U/S	D/S	U/S	D/S	Flow	Flow	Flow	Flow	Max	Min
1-Jul-17	17500	5800	3300	2300	10000	4200	22000	12000	28.4	12.2
2-Jul-**17**	18100	5800	3600	1800	8300	4200	22000	12000	31.6	16.4
3-Jul-**17**	18300	5700	4300	2300	3400	4400	22000	8500	32.5	15.2
4-Jul-**17**	19600	6800	4500	2300	2000	4500	22000	8000	31.6	18.0
5-Jul-**17**	19600	6800	4000	1800	2000	4800	22000	4900	29.6	16.5
6-Jul-**17**	17200	4300	4000	1800	2000	4500	22000	4000	25.4	13.4
7-Jul-**17**	16600	3700	4400	2900	2000	4400	22000	9000	30.5	16.6
8-Jul-**17**	16300	3500	5000	2900	2000	4200	22000	9000	25.6	13.5
9-Jul-**17**	16300	3500	5000	2900	2000	4200	22000	9000	32.5	15.2
10-Jul-**17**	15800	2800	1100	NIL	2000	4000	22000	9000	34.4	16.4
11-Jul-**17**	15000	2500	1100	-	2000	4500	22000	9000	37.3	18.0
12-Jul-**17**	15600	2500	1100	-	2000	4500	22000	12000	34.5	16.2
13-Jul-**17**	15800	3700	1200	-	2000	4200	22000	12000	30.4	16.4
14-Jul-**17**	16600	3700	1400	-	2000	4200	22000	12000	25.6	13.5
15-Jul-**17**	15400	2500	1400	-	2000	4200	22000	12000	32.5	14.5
16-Jul-**17**	16600	3700	1600	-	2000	4500	22000	8200	33.4	13.3
17-Jul-**17**	18400	5500	2300	-	2000	4500	22000	6000	34.4	20.5
18-Jul-**17**	17400	4200	2100	-	2000	4500	22000	6000	33.6	15.2
19-Jul-**17**	16400	3200	1800	-	2000	4500	22000	6000	30.3	17.4
20-Jul-**17**	16400	3200	1300	-	2000	4500	22000	6000	27.6	16.5
21-Jul-**17**	16400	3200	1600	-	2000	4500	22000	6000	30.4	15.2
22-Jul-**17**	16400	3200	1600	-	2000	4500	22000	6000	31.6	15.4
23-Jul-**17**	15800	2600	1300	-	2000	4500	22000	6000	31.0	18.6
24-Jul-**17**	15800	2600	1300	-	2000	4500	22000	6000	28.7	17.2
25-Jul-**17**	15800	2600	3600	3600	2000	4500	22000	6000	32.7	17.6
26-Jul-**17**	15200	2500	1300	1300	2000	4500	22000	6000	27.7	13.2
27-Jul-**17**	14700	2500	1300	1300	2000	4500	22000	6000	34.4	14.8
28-Jul-**17**	15800	2600	1300	1300	2000	4500	22000	6000	33.6	9.2
29-Jul-**17**	16000	2800	1300	1300	2000	4500	22000	6000	35.2	19.0
30-Jul-**17**	16200	3000	1000	-	2000	4500	22000	6000	33.6	19.2
31-Jul-**17**	16000	2800	800	-	2000	4500	22000	6000	35.6	17.0

Discharge in Cusec

DATE	TIME	INDUS			Kabul	INDUS						
		TARBELA			Nowshera	KALABAGH		CHASHMA			TAUNSA	
		Reservoir Level (Ft)	U/S	D/S	Flow	U/S	D/S	Reservoir Level (Ft)	U/S	D/S	U/S	D/S
1-Aug-17	0600	1532.00	322000	294100	51400	374300	366300	646.90	318700	312200	275900	253600
2-Aug-**17**	0600	1533.00	340300	312700	52000	375300	367300	646.40	387700	389400	277800	255500
3-Aug-**17**	0600	1534.00	344600	317000	59000	427500	419500	646.00	407100	407200	312300	290000
4-Aug-**17**	0600	1535.00	339200	311600	72300	420700	412700	645.50	427300	427700	367000	344500
5-Aug-**17**	0600	1537.00	324800	269500	63400	390700	382700	645.10	444800	441800	386500	380500
6-Aug-**17**	0600	1539.00	309800	254500	52400	329900	321900	644.50	403700	394300	418200	412200
7-Aug-**17**	0600	1541.00	295500	239000	52600	302700	294700	644.00	347100	333700	415100	409100
8-Aug-**17**	0600	1542.00	289800	260800	47700	302700	294700	643.00	308600	300100	369600	363600
9-Aug-**17**	0600	1543.00	295300	266200	45500	321900	313900	642.00	299900	290600	310600	290000
10-Aug-**17**	0600	1544.00	296700	67500	44500	313200	305200	642.00	319000	299500	288100	265300
11-Aug-**17**	0600	1545.00	283600	254400	45400	319200	311200	642.00	312900	294400	290500	267700
12-Aug-**17**	0600	1546.00	274800	245600	43900	300600	292600	642.00	323000	309200	293600	270800
13-Aug-**17**	0600	1547.00	258500	229600	41800	296600	288600	642.00	302600	290200	298100	283600
14-Aug-**17**	0600	1548.00	238600	209500	40100	268800	260600	642.00	297700	285300	301400	279900
15-Aug-**17**	0600	1549.00	212300	183100	41600	263200	256500	646.30	266000	200000	287900	265400
16-Aug-**17**	0600	1550.00	203600	174600	36400	223300	216100	647.20	229900	200000	237400	214700
17-Aug-**17**	0600	1550.00	185400	185100	31100	219600	212400	647.00	220400	210000	183800	160800
18-Aug-**17**	0600	1548.17	157700	210000	26200	210700	203000	645.60	222600	230000	201600	178600
19-Aug-**17**	0600	1546.49	152300	200000	25100	234900	227200	645.80	227300	210000	209000	186000
20-Aug-**17**	0600	1545.35	157600	190000	26200	213200	205200	646.30	232200	210000	217000	194000
21-Aug-**17**	0600	1544.69	161000	180000	30600	185100	177100	646.30	224500	210000	199500	176500
22-Aug-**17**	0600	1544.30	164100	175000	27600	194300	186300	646.10	218200	207000	197700	183000
23-Aug-**17**	0600	1543.77	16000	175000	26000	174800	166800	645.70	215700	207000	196200	173500
24-Aug-**17**	0600	1543.62	160700	165000	26500	174700	166700	645.30	206000	197000	193700	171000
25-Aug-**17**	0600	1543.73	168200	165000	27300	216000	208000	645.60	208700	190000	191300	168300
26-Aug-**17**	0600	1544.06	169500	160000	5800	220000	212000	646.50	217200	190000	185400	160100
27-Aug-**17**	0600	1544.20	164400	160000	32400	195800	187800	647.50	219700	190000	179600	154700
28-Aug-**17**	0600	1544.00	149700	155000	28100	194300	186300	647.70	205400	190000	183800	158300
29-Aug-**17**	0600	1543.24	133600	155000	21500	163700	155700	647.80	203400	190000	180300	155500
30-Aug-**17**	0600	1542.54	125300	145000	20700	161500	153500	647.40	183200	180000	180300	155700
31-Aug-**17**	0600	1541.92	127600	145000	20100	148200	140200	647.60	182600	170000	178300	155700

Discharge in Cusec

DATE	INDUS						JHELUM				
	GUDDU		SUKKAR		KOTRI		MANGLA			RASUL	
	U/S	D/S	U/S	D/S	U/S	D/S	Reservoir Level (Ft)	U/S	D/S	U/S	D/S
1-Aug-17	234400	200100	199200	144100	120600	82900	1225.80	37900	10000	2600	NIL
2-Aug-**17**	233500	197100	191900	136500	127200	88400	1226.75	45300	10000	14700	11900
3-Aug-**17**	236200	201800	191900	136500	122400	82900	1227.90	52700	10000	10800	8000
4-Aug-**17**	244800	210600	193600	138000	118500	78800	1228.75	41600	10000	8000	5300
5-Aug-**17**	248200	214000	196000	139700	122700	82900	1229.35	32300	10000	2700	NIL
6-Aug-**17**	299500	266300	200300	144000	127200	87000	1229.95	32300	10000	2800	-
7-Aug-**17**	345600	315000	237400	181000	127000	87000	1230.40	27500	10000	8200	5300
8-Aug-**17**	362400	329600	277800	221400	127100	87000	1230.90	29500	10000	8300	5300
9-Aug-**17**	456500	423400	303000	245600	127100	87000	1231.35	27600	10000	8300	5300
10-Aug-**17**	459800	428600	380300	322600	129000	88800	1231.80	27600	10000	8300	5300
11-Aug-**17**	415100	383100	390900	333100	131700	91600	1232.40	33500	10000	2900	NIL
12-Aug-**17**	358100	326900	390900	333100	136300	96000	1232.90	29500	10000	2800	-
13-Aug-**17**	307000	273200	354900	297100	163300	123800	1233.35	27600	10000	8200	5300
14-Aug-**17**	303200	269100	280300	222500	179100	139400	1233.85	29500	10000	7700	5300
15-Aug-**17**	302000	269100	262000	204200	185500	146100	1234.20	23700	10000	7800	5300
16-Aug-**17**	308000	275600	257300	199500	200200	160400	1234.60	25600	10000	2200	-
17-Aug-**17**	297200	265300	257300	199500	210700	170400	1234.95	23700	10000	7700	5300
18-Aug-**17**	240100	208800	240900	183200	251300	210900	1234.85	18800	22700	14200	11900
19-Aug-**17**	201700	169200	191900	134100	230700	190200	1234.55	19100	30400	27000	11900
20-Aug-**17**	200200	165800	154900	97100	180100	139400	1234.25	23300	35000	29200	11900
21-Aug-**17**	199000	165800	144600	86800	168200	127900	1234.10	24100	30000	25400	8000
22-Aug-**17**	218300	185800	154800	97300	163400	127900	1233.80	18300	30000	25400	8000
23-Aug-**17**	203500	173800	154800	97300	161700	139400	1233.55	20200	30000	29300	11900
24-Aug-**17**	198500	169900	150000	93000	143000	118400	1233.30	20200	30000	25400	8000
25-Aug-**17**	184300	155600	141200	84000	114200	85300	1233.10	22200	30000	25400	8000
26-Aug-**17**	176500	146800	130600	73300	81900	51700	1233.00	26100	30000	33100	15800
27-Aug-**17**	168700	137000	121200	63800	74100	39900	1232.65	16300	30000	33200	15800
28-Aug-**17**	160700	127700	116500	59300	81700	45300	1232.35	14800	26500	22700	5300
29-Aug-**17**	157100	123500	114400	57600	81700	48300	1232.00	14900	28600	25300	8000
30-Aug-**17**	153400	123500	111000	57600	76200	51700	1231.15	11800	45000	44900	27500
31-Aug-**17**	157700	150100	114700	68200	70700	64300	1230.35	13700	45000	40600	23600

Discharge in Cusec

DATE	CHENAB								RAVI			
	MARALA		QADIR ABAD		TRIMMU		PANJAND		BALLOKI		SIDHNAI	
	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S
1-Aug-17	122800	92800	156400	134400	43700	30900	29200	14600	43100	10300	17500	2300
2-Aug-**17**	126600	98800	141400	119400	51900	39100	27700	13200	45400	13000	17500	2300
3-Aug-**17**	144900	124600	164200	142200	74800	62000	26300	11200	52200	19400	17800	2300
4-Aug-**17**	80500	68200	109800	87800	92800	80000	24700	9200	68100	35300	17800	2300
5-Aug-**17**	95300	82800	96300	74300	98000	85200	30100	14600	62600	29700	18100	2600
6-Aug-**17**	89300	68200	84700	62700	80700	68400	37500	22000	52000	19100	21300	5900
7-Aug-**17**	91300	68200	84700	62700	72900	60600	42800	27300	50200	17300	27000	27000
8-Aug-**17**	91300	68200	80800	58800	71500	59200	66400	50900	54400	21300	54400	21300
9-Aug-**17**	86200	63100	113300	91300	67100	54700	79000	63500	60300	27300	29200	13900
10-Aug-**17**	91300	68200	73400	51400	67100	54700	78800	63500	61500	28500	25300	9800
11-Aug-**17**	89000	63100	73400	51400	61900	59600	64600	49600	65800	32700	25100	9800
12-Aug-**17**	75600	57000	60800	38800	69100	59600	62000	47200	66400	36800	28700	13300
13-Aug-**17**	81800	52600	46800	24800	64500	55000	57000	42200	63500	34400	28700	13300
14-Aug-**17**	70800	41300	51900	29900	56900	47400	56000	41100	55300	26100	29000	13600
15-Aug-**17**	89100	59500	36500	14500	42500	32900	58800	43800	53600	24900	29800	14400
16-Aug-**17**	72200	42600	48100	26100	36400	26900	59700	45100	52400	23700	29800	14400
17-Aug-**17**	48900	19300	22000	NIL	36400	26900	60100	45100	53200	20200	29900	14400
18-Aug-**17**	58500	26900	22000	-	32900	23400	57500	42300	52000	19000	29600	14100
19-Aug-**17**	62300	30700	28700	6700	28000	18400	56400	41200	48800	15800	29800	14100
20-Aug-**17**	62400	30700	35300	13300	21200	11600	47900	32700	47500	14300	27300	11900
21-Aug-**17**	58500	26900	43000	21000	17000	7300	48000	32700	44600	11400	25600	10500
22-Aug-**17**	51000	19400	40500	18500	24500	14900	45200	29900	43900	10700	20400	5000
23-Aug-**17**	52000	19300	35300	13300	32500	22900	44000	28700	42700	9500	17700	2300
24-Aug-**17**	55800	23100	36600	14600	33500	19400	35600	20300	41500	8300	19400	4000
25-Aug-**17**	63300	30700	37900	15900	31300	16100	21900	6600	42700	9500	19500	4000
26-Aug-**17**	63400	30700	41800	19800	24700	9500	20600	5100	44200	1100	19300	4000
27-Aug-**17**	55800	23100	41800	19800	24700	11500	24700	9200	49900	16600	19900	4600
28-Aug-**17**	41600	8900	34000	12000	26800	13500	24800	9200	51100	17800	19300	4000
29-Aug-**17**	47500	14700	22000	-	33900	20700	22800	7200	44300	11000	21600	6600
30-Aug-**17**	50400	17600	28700	6700	36400	23200	22800	7200	44300	11000	21800	6600
31-Aug-**17**	54900	23100	31300	9300	32000	19000	22000	7400	44300	11000	20000	5600

Discharge in Cusec

DATE	SUTLEJ				LINKS/CANAL				SKARDU	
	SULEMANKI		ISLAM		C.J	CRBC	Q.B	T.P	Temperature ^{0}C	
	U/S	D/S	U/S	D/S	Flow	Flow	Flow	Flow	Max	Min
1-Aug-17	16000	2800	900	NIL	2000	4500	22000	6000	36.6	21.4
2-Aug-**17**	16300	3000	700	-	2000	4500	22000	6000	37.8	21.5
3-Aug-**17**	16300	3000	1000	-	2000	4500	22000	6000	35.2	16.0
4-Aug-**17**	16000	2700	1200	-	2000	4500	22000	6000	31.2	15.0
5-Aug-**17**	16900	3500	2100	-	7300	4600	22000	6000	32.2	15.0
6-Aug-**17**	17800	4400	1600	-	15000	4600	22000	6000	31.6	14.4
7-Aug-**17**	17900	4400	2100	-	15000	4600	22000	6000	33.3	16.0
8-Aug-**17**	19700	6300	1900	-	15000	4600	22000	6000	35.8	16.4
9-Aug-**17**	20200	6800	2100	-	15000	4600	22000	6000	34.8	17.4
10-Aug-**17**	21200	8000	2100	-	15000	4400	22000	6000	29.2	15.0
11-Aug-**17**	26800	13500	2300	-	11800	4400	22000	6000	29.6	15.5
12-Aug-**17**	25700	13500	3800	1300	8000	4400	22000	6000	27.3	16.4
13-Aug-**17**	30900	17800	5500	2900	8000	4400	22000	6000	27.6	16.0
14-Aug-**17**	33900	20700	8500	5800	8000	4400	22000	6000	31.2	16.5
15-Aug-**17**	33900	20900	11000	8300	10000	4400	22000	6000	22.7	12.0
16-Aug-**17**	29800	14400	13900	11100	10000	4400	22000	6000	26.2	13.4
17-Aug-**17**	22000	8900	17000	14200	10000	4500	22000	6000	29.5	12.5
18-Aug-**17**	24700	11600	17000	14200	10000	4500	22000	6000	30.2	12.4
19-Aug-**17**	25000	13800	14900	12100	10000	4500	22000	6000	30.6	13.0
20-Aug-**17**	20200	7900	10200	7500	10000	4500	22000	6000	33.7	18.0
21-Aug-**17**	21100	8000	10200	7500	10000	4500	22000	6000	26.4	11.4
22-Aug-**17**	18600	5500	9400	6600	10000	4500	22000	6000	30.3	12.0
23-Aug-**17**	17300	3900	7000	4300	10000	4500	22000	6000	32.8	12.8
24-Aug-**17**	19800	6500	4000	1300	10000	4600	22000	6000	34.2	12.0
25-Aug-**17**	22700	9300	2800	NIL	10000	4600	22000	6000	31.7	17.4
26-Aug-**17**	22100	10100	1600	-	7000	4600	22000	8400	22.8	13.2
27-Aug-**17**	22900	10100	2100	-	7000	4400	22000	7900	25.1	10.4
28-Aug-**17**	23400	10100	4000	1200	7000	4400	22000	8200	28.0	10.0
29-Aug-**17**	21500	8200	4600	1800	7000	4400	22000	8700	30.8	10.0
30-Aug-**17**	22000	8800	6400	3800	7000	4400	22000	8700	31.2	14.4
31-Aug-**17**	19600	7500	6400	3800	2000	4000	22000	9000	30.6	11.0

Discharge in Cusec

DATE	TIME	INDUS			Kabul	INDUS						
		TARBELA			Nowshera	KALABAGH		CHASHMA			TAUNSA	
		Reservoir Level (Ft)	U/S	D/S	Flow	U/S	D/S	Reservoir Level (Ft)	U/S	D/S	U/S	D/S
1-Sep-17	0600	1541.56	130300	140000	16300	152700	144700	647.00	163800	170000	168500	148300
2-Sep-**17**	0600	1541.28	132300	140000	18800	157000	149000	646.80	167700	165000	158100	138100
3-Sep-**17**	0600	1541.03	132800	140000	21000	159500	152000	646.80	171000	165000	162400	140300
4-Sep-**17**	0600	1540.58	127000	140000	20100	150600	143100	646.70	166300	162000	159400	138100
5-Sep-**17**	0600	1539.77	117000	140000	19200	162300	154800	647.20	176800	162000	158700	127300
6-Sep-**17**	0600	1538.70	110400	140000	19700	153100	145600	647.40	172000	162000	156300	137900
7-Sep-**17**	0600	1537.47	106100	140000	18900	147900	140400	647.30	166000	162000	155600	137300
8-Sep-**17**	0600	1536.22	100800	135000	18700	148000	140500	647.60	169100	157000	153400	134600
9-Sep-**17**	0600	1534.97	96000	130000	17400	151200	143700	647.50	159000	155000	153700	134600
10-Sep-**17**	0600	1533.64	93800	130000	17300	151600	144100	647.00	150800	155000	148100	129200
11-Sep-**17**	0600	1532.40	96400	130000	18000	161200	153700	646.60	159500	160000	148100	129000
12-Sep-**17**	0600	1531.10	94800	130000	19400	150200	142700	646.60	166100	160000	148300	129700
13-Sep-**17**	0600	1529.90	92800	125000	19800	161300	153500	645.90	155000	160000	155000	135200
14-Sep-**17**	0600	1528.44	87200	125000	17300	160900	153400	645.80	159800	155000	153600	134900
15-Sep-**17**	0600	1526.70	84600	130000	17400	150100	142600	645.10	151400	155000	153300	135000
16-Sep-**17**	0600	1524.55	78800	135000	17100	150000	142500	644.10	148700	155000	146900	129300
17-Sep-**17**	0600	1522.18	73100	135000	15700	151100	143600	643.40	153300	155000	149600	131700
18-Sep-**17**	0600	12519.61	68200	135000	12500	146300	138800	642.60	152700	155000	149600	129500
19-Sep-**17**	0600	1516.87	66200	135000	11500	146700	139200	643.10	166300	155000	151700	131300
20-Sep-**17**	0600	1514.90	60700	110000	10300	161600	154100	641.30	138200	150000	149000	129000
21-Sep-**17**	0600	1512.87	59200	110000	9700	131200	123700	643.20	145000	120000	148200	129000
22-Sep-**17**	0600	1511.24	59400	100000	800	124000	116500	642.80	121700	120000	141800	123400
23-Sep-**17**	0600	1509.67	61200	100000	6900	105700	98200	642.50	117900	115000	110900	92900
24-Sep-**17**	0600	1508.06	61400	100000	7700	122400	114900	640.10	99100	115000	110900	92900
25-Sep-**17**	0600	1506.66	61500	95000	7500	111200	103700	640.80	116800	105000	106200	89000
26-Sep-**17**	0600	1505.25	61300	95000	6400	94300	86800	641.10	113600	105000	106200	89000
27-Sep-**17**	0600	1503.88	59500	92300	6700	103400	95900	640.60	101700	100000	97800	79000
28-Sep-**17**	0600	1501.27	59800	90000	7500	106700	99200	641.10	110300	100000	95700	77300
29-Sep-**17**	0600	1500.00	57700	90000	6800	93300	85700	639.00	96000	100000	93100	75200
30-Sep-**17**	0600	1500.15	58400	85000	6700	96800	75800	640.20	103400	95000	91300	73700

Discharge in Cusec

DATE	INDUS						JHELUM				
	GUDDU		SUKKAR		KOTRI		MANGLA			RASUL	
	U/S	D/S	U/S	D/S	U/S	D/S	Reservoir Level (Ft)	U/S	D/S	U/S	D/S
1-Sep-17	155100	143700	138400	99800	62100	55900	130.00	26300	40000	44100	27500
2-Sep-**17**	155100	143700	134700	94400	55800	48300	1229.90	31300	35000	39900	23600
3-Sep-**17**	161500	147400	135900	92100	52200	39900	1229.55	22000	35000	36300	19700
4-Sep-**17**	1630000	141500	136500	87100	52300	38100	1229.30	15100	30000	28400	11900
5-Sep-**17**	153000	131000	126200	73400	53900	31300	1228.85	17000	30000	32600	15800
6-Sep-**17**	144700	118000	118100	61900	62300	29100	1228.35	13300	30000	29400	11900
7-Sep-**17**	133500	104200	102000	46500	89000	53600	1227.80	19600	40000	29400	11900
8-Sep-**17**	137200	104200	98800	43800	83900	47300	1227.15	15900	40000	37000	19700
9-Sep-**17**	138300	104200	98100	42500	81000	43800	1226.50	15900	40000	36800	19700
10-Sep-**17**	139700	104200	97800	41900	75300	38100	1225.80	14000	40000	33000	15800
11-Sep-**17**	141300	106300	99000	42100	62800	25500	1225.20	17700	40000	40900	23600
12-Sep-**17**	141000	106300	99000	42100	52600	15300	1224.60	17700	40000	33000	15800
13-Sep-**17**	137200	104600	100200	43000	39600	2400	1223.95	15900	40000	35000	15800
14-Sep-**17**	128100	98100	98700	42100	39600	2400	1223.10	13400	45000	39300	19700
15-Sep-**17**	123700	94300	93400	37700	38800	1600	1222.20	11600	45000	39300	19700
16-Sep-**17**	124200	94300	90000	35300	38800	1600	1221.20	12900	50000	35400	15800
17-Sep-**17**	122900	94300	89800	35300	38100	1300	1220.20	12900	50000	35800	15800
18-Sep-**17**	122200	94300	89800	35300	37100	1000	1219.15	12700	50000	39000	19700
19-Sep-**17**	119700	94300	88000	34200	37100	1000	1217.90	11100	55000	43600	23600
20-Sep-**17**	119700	94300	88100	34200	36800	1000	1216.65	11100	55000	43600	23600
21-Sep-**17**	119700	94300	87900	33900	35200	400	1215.4	11100	55000	44400	23600
22-Sep-**17**	119200	94300	87800	33900	33500	400	1214.15	11100	55000	48500	27500
23-Sep-**17**	119200	94300	87800	33900	33500	400	1212.90	11100	55000	32900	11900
24-Sep-**17**	120100	94300	87800	33900	33500	400	1211.60	9300	55000	48500	27500
25-Sep-**17**	98900	72400	87800	33900	32600	300	1210.30	9300	55000	44600	23600
26-Sep-**17**	89300	66100	70600	19500	32600	300	1208.95	9800	55000	44500	23600
27-Sep-**17**	86400	661000	62900	13500	32300	300	1207.60	10400	55000	44500	23600
28-Sep-**17**	83700	65700	62900	13500	32300	300	1206.25	10400	55000	40700	19700
29-Sep-**17**	81900	65400	62200	12800	29400	NIL	1204.90	10400	55000	48500	27500
30-Sep-**17**	78600	63300	61500	12800	27200	-	1203.50	8800	55000	56300	35300

Discharge in Cusec

DATE	CHENAB								RAVI			
	MARALA		QADIR ABAD		TRIMMU		PANJAND		BALLOKI		SIDHNAI	
	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S
1-Sep-17	52400	20500	33900	11900	21200	8500	23000	8200	44100	14600	18000	6600
2-Sep-**17**	62500	30700	37800	15800	19000	6300	26700	15200	43200	13700	19100	6600
3-Sep-**17**	54900	23100	48100	26100	27100	14400	29100	17900	43000	13700	19100	6600
4-Sep-**17**	43600	11800	36600	14600	3300	20600	29100	17900	45200	14600	20500	6600
5-Sep-**17**	42600	11800	32700	10700	43000	30100	33800	20300	48000	16400	21600	6700
6-Sep-**17**	38900	8000	24700	2700	46700	33800	29800	16700	47100	15500	21600	6600
7-Sep-**17**	39600	8000	2000	NIL	39200	26300	27000	13200	46700	13700	22100	7300
8-Sep-**17**	37600	6000	2100	-	29100	16000	28300	14200	43900	10700	23300	8500
9-Sep-**17**	33800	8000	22000	-	25300	12200	32800	17700	43900	10700	23300	8500
10-Sep-**17**	29700	8000	19800	-	19400	6300	36100	21100	42700	9500	23200	8500
11-Sep-**17**	28900	8000	20800	-	24400	11300	36100	21100	39000	5900	20700	5900
12-Sep-**17**	31700	8000	19000	-	24400	11300	28000	13200	34900	1800	18800	4000
13-Sep-**17**	28000	8000	21700	-	22000	6400	26200	11600	34900	1800	16200	1300
14-Sep-**17**	26700	8000	22000	-	22000	6400	18900	3600	40200	7100	16200	1300
15-Sep-**17**	22100	8000	22000	-	22000	6400	17300	1700	33100	NIL	15100	NIL
16-Sep-**17**	22800	8000	21000	-	22000	6400	15700	NIL	29000	-	15100	-
17-Sep-**17**	22900	8000	22000	-	19600	4000	15700	-	29000	-	15300	-
18-Sep-**17**	22900	8000	24700	2700	22000	6400	12100	-	26000	-	15900	700
19-Sep-**17**	21700	8000	22000	NIL	22200	7600	11500	-	23500	-	15300	NIL
20-Sep-**17**	21300	8000	22000	-	23400	8800	10300	-	23500	-	14000	-
21-Sep-**17**	20800	8000	22000	-	26800	11200	10600	-	23500	-	13500	-
22-Sep-**17**	21900	7000	21000	-	27900	11200	11700	-	22000	-	14000	-
23-Sep-**17**	21200	7000	22000	-	27900	11200	10900	-	22000	-	14400	-
24-Sep-**17**	21900	7000	22600	-	28900	12200	11200	-	22000	-	14400	-
25-Sep-**17**	24800	9900	22000	-	31100	14400	12000	-	22600	-	14400	-
26-Sep-**17**	21900	7000	22000	-	31100	14400	12000	-	22600	-	14000	-
27-Sep-**17**	21900	7000	23400	1400	28300	11100	12300	-	22400	-	14200	-
28-Sep-**17**	18900	4000	23400	1400	31400	14400	13000	-	21600	-	14900	-
29-Sep-**17**	18900	4000	21000	NIL	31400	14400	13300	-	22500	-	15000	-
30-Sep-**17**	18900	4000	20000	-	30400	13300	13400	-	22000	-	15000	-

Discharge in Cusec

DATE	SUTLEJ				LINKS/CANAL				SKARDU	
	SULEMANKI		ISLAM		C.J	CRBC	Q.B	T.P	Temperature ^{0}C	
	U/S	D/S	U/S	D/S	Flow	Flow	Flow	Flow	Max	Min
1-Sep-17	21200	10200	7300	6300	2000	4000	22000	8300	30.2	15.4
2-Sep-**17**	20700	10800	7300	6300	2000	4000	22000	8300	26.2	13.8
3-Sep-**17**	20700	10800	7300	6300	2000	4000	22000	9000	18.6	10.0
4-Sep-**17**	20800	9100	5600	5300	2000	3900	22000	7500	23.8	9.2
5-Sep-**17**	21600	9100	6600	4300	2000	3800	22000	5100	28.2	11.4
6-Sep-**17**	22700	10600	8800	7000	2000	4000	22000	1600	29.7	10.1
7-Sep-**17**	22900	10600	8800	7000	2000	4000	20000	1700	27.2	11.8
8-Sep-**17**	23600	11500	8800	7000	2000	4000	21100	1700	22.2	9.1
9-Sep-**17**	23500	11500	9600	7900	2000	4000	22000	2000	27.6	9.0
10-Sep-**17**	17500	4900	9600	7900	2000	4000	19800	1900	27.8	9.3
11-Sep-**17**	17500	4900	10100	7900	2000	4000	20800	10600	30.2	9.3
12-Sep-**17**	16400	3800	6600	4300	2000	4200	19000	900	24.3	9.0
13-Sep-**17**	17200	4500	2600	NIL	2000	4200	21700	1400	22.7	9.2
14-Sep-**17**	15400	2500	2600	-	2000	4200	22000	2400	23.2	10.4
15-Sep-**17**	15500	2500	1900	-	2000	4200	22000	200	20.2	9.0
16-Sep-**17**	15500	2500	2200	-	2000	4200	21000	1300	23.4	8.2
17-Sep-**17**	15500	2500	2600	-	2000	4200	22000	2600	22.0	10.8
18-Sep-**17**	14500	2500	2600	-	2000	4200	22000	4800	22.8	8.0
19-Sep-**17**	14000	2500	2600	-	2000	4000	22000	5200	25.8	7.4
20-Sep-**17**	12300	NIL	2600	-	2000	4000	22000	4800	27.8	6.4
21-Sep-**17**	11100	-	1500	-	2000	4000	22000	4800	28.8	6.2
22-Sep-**17**	11100	-	1400	-	2000	4000	22000	3900	27.8	12.6
23-Sep-**17**	11100	-	600	-	2000	4000	22000	3400	26.8	7.4
24-Sep-**17**	10000	-	NIL	-	2000	4000	22600	3400	27.8	7.0
25-Sep-**17**	11100	-	-	-	2000	4000	22000	2700	28.3	10.5
26-Sep-**17**	11300	-	-	-	2000	4000	22000	3900	27.8	7.4
27-Sep-**17**	11100	-	-	-	2000	4000	22000	3900	36.8	7.6
28-Sep-**17**	11400	-	-	-	2000	4000	22000	3900	25.3	8.2
29-Sep-**17**	11600	-	-	-	2000	4000	21000	3400	27.1	8.4
30-Sep-**17**	11600	-	1000	-	2000	4000	22000	3100	26.7	8.0

Discharge in Cusec

DATE	TIME	INDUS			Kabul	INDUS						
		TARBELA			Nowshera	KALABAGH		CHASHMA			TAUNSA	
		Reservoir Level (Ft)	U/S	D/S	Flow	U/S	D/S	Reservoir Level (Ft)	U/S	D/S	U/S	D/S
1-Oct-17	0600	1498.96	58200	85000	6500	84500	77000	639.70	92100	90000	91300	73700
2-Oct-**17**	0600	1497.66	55800	85000	6600	95400	87900	638.90	90100	90000	87200	70400
3-Oct-**17**	0600	1496.31	54700	85000	6400	106700	99200	639.30	93600	85000	82900	68700
4-Oct-**17**	0600	1495.08	52500	80000	6000	85000	77500	641.10	105200	85000	80100	66400
5-Oct-**17**	0600	1493.82	51800	80000	5800	99900	92400	640.40	84900	85000	80100	66400
6-Oct-**17**	0600	1492.97	51200	70000	5600	88100	80600	640.80	88700	80000	76900	63700
7-Oct-**17**	0600	1492.00	48500	70000	5900	102200	94700	640.40	80700	80000	76900	63700
8-Oct-**17**	0600	1490.95	46900	70000	6400	86200	78700	640.00	79700	79100	72700	58800
9-Oct-**17**	0600	1489.87	45900	70000	6300	86800	79300	640.00	70400	66400	72700	58800
10-Oct-**17**	0600	1488.70	44900	70000	6200	90900	83400	640.00	73600	69600	72800	58800
11-Oct-**7**	0600	1487.53	43400	68500	5900	90800	83300	641.00	82300	70000	63900	55000
12-Oct-**17**	0600	1486.39	40500	65000	5600	99900	92400	641.30	76800	70000	65300	56200
13-Oct-**17**	0600	1485.67	39800	55000	4800	85900	78900	640.80	69700	70000	66000	56200
14-Oct-**17**	0600	1485.15	39200	50000	4400	79500	72500	639.90	66800	70000	66000	56200
15-Oct-**17**	0600	1484.95	36400	40000	3700	69700	62700	638.15	54000	62100	67300	57300
16-Oct-**17**	0600	1484.75	36400	40000	6300	56600	49600	639.60	53800	40000	67300	57300
17-Oct-**17**	0600	1484.45	34200	40000	3900	61700	55700	639.30	42000	40000	62200	52900
18-Oct-**17**	0600	1484.19	35100	40000	3800	50600	44600	639.90	48600	40000	49000	48700
19-Oct-**17**	0600	1483.83	32800	40000	3300	67500	61500	640.00	44900	40000	45100	44600
20-Oct-**17**	0600	1483.56	32900	35000	3800	48700	42700	640.20	45900	40000	38700	38200
21-Oct-**17**	0600	1483.56	32700	35000	3900	46900	40900	639.50	38900	40000	38700	38200
22-Oct-**17**	0600	1483.33	30700	35000	3300	44300	38300	638.15	34700	40000	39900	39400
23-Oct-**17**	0600	1483.13	31400	35000	4300	47300	41300	638.15	35300	31800	39900	39400
24-Oct-**17**	0600	1482.68	30800	40000	3500	43200	37200	638.15	41900	38300	37600	37100
25-Oct-**17**	0600	1482.42	30000	35000	3700	51800	45800	638.15	36900	36400	36400	35900
26-Oct-**17**	0600	1482.14	29500	35000	3700	44900	38900	639.40	47000	35000	35400	34900
27-Oct-**17**	0600	1481.85	29300	35000	3400	53100	47100	639.30	38200	35000	37600	37100
28-Oct-**17**	0600	1481.56	29300	35000	3200	45800	39800	638.60	33900	35000	37600	37100
29-Oct-**17**	0600	1481.22	28300	35000	3900	56900	50900	638.70	39300	35000	37600	37100
30-Oct-**17**	0600	1480.87	28100	35000	1600	51700	45700	638.30	36700	35000	37600	37100
31-Oct-**17**	0600	1480.02	27000	45000	3300	57800	51800	638.15	36300	33800	37600	37100

Discharge in Cusec

DATE	INDUS						JHELUM				
	GUDDU		SUKKAR		KOTRI		MANGLA			RASUL	
	U/S	D/S	U/S	D/S	U/S	D/S	Reservoir Level (Ft)	U/S	D/S	U/S	D/S
1-Oct-17	71100	55200	58200	11900	25800	NIL	1202.05	7100	55000	48400	27500
2-Oct-**17**	69100	53100	54900	11000	17200	-	1200.55	8300	55000	48400	27500
3-Oct-**17**	68700	53000	51900	11000	12200	-	1199.10	12300	55000	44800	23600
4-Oct-**17**	66900	53000	51900	11000	12200	-	1197.70	15000	55000	44600	23600
5-Oct-**17**	65500	52400	51900	11000	11800	-	1196.30	15000	55000	44600	23600
6-Oct-**17**	65600	49100	52000	11000	11800	-	1195.20	13600	45000	44600	23600
7-Oct-**17**	62600	46400	51000	11000	10800	-	1193.95	9300	45000	40700	19700
8-Oct-**17**	59800	46800	49700	11000	10300	-	1192.70	9300	45000	40700	19700
9-Oct-**17**	59300	46800	47400	10300	10000	-	1191.60	8600	40000	40700	19700
10-Oct-**17**	59100	48500	46800	10300	10000	-	1190.45	7200	40000	36800	15800
11-Oct-**17**	57900	47600	47600	10300	9900	-	1189.20	6000	40000	36900	15800
12-Oct-**17**	55500	45400	48100	13400	9600	-	1188.10	6000	35000	32900	11900
13-Oct-**17**	53500	43400	47300	12700	9600	-	1187.05	7300	35000	36800	15800
14-Oct-**17**	51500	41400	42900	10300	9600	-	1186.00	7300	35000	32900	11900
15-Oct-**17**	51500	41400	42900	10300	9100	-	1185.05	9900	35000	29000	8000
16-Oct-**17**	51500	41400	41600	10000	9100	-	1184.20	7600	35000	22900	8000
17-Oct-**17**	51500	41400	41000	10000	9100	-	1183.35	7600	30000	26800	11900
18-Oct-**17**	51500	41400	41600	10000	10500	-	1182.65	6500	25000	20300	5300
19-Oct-**17**	51500	41400	39900	10000	10200	-	1182.50	6000	10000	12000	NIL
20-Oct-**17**	51500	41400	38900	9400	8800	-	1182.35	6000	10000	12000	-
21-Oct-**17**	47600	38300	39200	10300	8800	-	1182.35	5000	5000	8000	-
22-Oct-**17**	43400	34100	38900	10300	8800	-	1182.40	6300	5000	8000	-
23-Oct-**17**	43400	34100	37500	9400	8800	-	1182.45	6300	5000	8000	-
24-Oct-**17**	43400	34100	35400	8400	8500		1182.60	5300	1300	8000	-
25-Oct-**17**	43400	34100	34900	8400	8500	-	1182.75	4100	100	6500	-
26-Oct-**17**	43400	34100	35300	8400	7700	-	1182.90	4100	100	H/UP	-
27-Oct-**17**	43400	34100	35700	9200	8600	-	1182.90	5900	5900	-	-
28-Oct-**17**	43500	35100	36000	9300	8600	-	1182.75	6000	10000	11200	-
29-Oct-**17**	41900	34100	35900	10100	7900	-	1182.25	6800	20000	21800	-
30-Oct-**17**	41500	33700	34500	9300	7400	-	1181.70	5500	20000	15500	-
31-Oct-**17**	41500	33700	34500	9300	7400	-	1180.80	6200	30000	36300	-

Discharge in Cusec

DATE	CHENAB								RAVI			
	MARALA		QADIR ABAD		TRIMMU		PANJAND		BALLOKI		SIDHNAI	
	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S	U/S	D/S
1-Oct-17	18900	4000	19500	NIL	31500	14400	13400	NIL	21000	NIL	15000	NIL
2-Oct-**17**	19900	5000	19500	-	31500	14400	14400	-	20000	-	15000	-
3-Oct-**17**	18900	4000	19500	-	31500	14400	13000	-	20000	-	15000	-
4-Oct-**17**	12900	4000	19500	-	31000	14400	13100	-	20000	-	15000	-
5-Oct-**17**	18400	3600	19500	-	29900	13200	13600	-	20000	-	14500	-
6-Oct-**17**	19400	4600	19500	-	28700	12100	13900	-	20000	-	14500	-
7-Oct-**17**	19400	4600	19500	-	28700	12100	12100	-	20000	-	14000	-
8-Oct-**17**	18400	3600	19500	-	28900	12100	12100	-	20000	-	14500	-
9-Oct-**17**	18000	4000	19500	-	28900	12100	12100	-	20000	-	14400	-
10-Oct-**17**	16600	4000	19500	-	24400	7600	11900	-	20000	-	14400	-
11-Oct-**17**	16200	4000	19500	-	22100	5300	11500	-	20000	-	14000	-
12-Oct-**17**	16600	4000	19500	-	19700	2900	11500	-	18000	-	14200	-
13-Oct-**17**	15900	4000	19500	-	19700	2900	11500	-	18000	-	14200	-
14-Oct-**17**	14900	4000	19500	-	19700	2900	11500	-	18500	-	13200	-
15-Oct-**17**	13100	4000	19500	-	19700	2900	8600	-	18500	-	12500	-
16-Oct-**17**	11700	4000	18000	-	12100	2100	3900	-	18000	-	6700	-
17-Oct-**17**	11900	4000	15000	-	12100	2100	4700	-	18000	-	9000	3000
18-Oct-**17**	11500	4000	15000	-	12100	2100	3900	-	16000	-	9000	3000
19-Oct-**17**	11200	4000	15000	-	12100	2100	5000	-	15500	-	7000	1000
20-Oct-**17**	11500	4000	8700	-	12100	2100	5100	-	15000	-	6000	-
21-Oct-**17**	10600	2600	11700	-	6100	2100	7000	7000	11500	-	7300	7300
22-Oct-**17**	10600	2600	12400	-	5900	5900	5000	5000	12000	-	3000	3000
23-Oct-**17**	10600	2600	10500	-	4900	4900	4200	4200	16200	4200	700	700
24-Oct-**17**	13100	5100	10400		4000	4000	4300	5300	15500	NIL	700	700
25-Oct-**17**	10600	2600	2500	2500	9500	NIL	1000	1000	15500	-	300	300
26-Oct-**17**	10600	2600	2500	2500	6200	-	4000	4000	14500	-	300	300
27-Oct-**17**	9700	1700	2500	2500	5100	-	4000	4000	12000	-	300	300
28-Oct-**17**	9700	1700	1900	1900	8400	-	4000	4000	11000	-	300	300
29-Oct-**17**	9700	1700	1800	1800	14300	-	4000	4000	11000	-	300	300
30-Oct-**17**	8500	900	1800	1800	16400	1400	4000	4000	17500	5500	300	300
31-Oct-**17**	8800	2000	H.up	-	16400	1400	4000	4000	17000	5000	300	300

Discharge in Cusec

DATE	SUTLEJ				LINKS/CANAL				SKARDU	
	SULEMANKI		ISLAM		C.J	CRBC	Q.B	T.P	Temperature ^{0}C	
	U/S	D/S	U/S	D/S	Flow	Flow	Flow	Flow	Max	Min
1-Oct-17	11100	NIL	1000	NIL	2000	4000	19500	3100	27.4	7.2
2-Oct-**17**	11100	-	700	-	2000	3800	19500	2300	25.6	9.2
3-Oct-**17**	10500	-	500	-	2000	3800	19500	NIL	23.8	7.0
4-Oct-**17**	10500	-	500	-	2000	3800	19500	-	25.3	6.2
5-Oct-**17**	11500	-	500	-	2000	3800	19500	-	27.8	8.4
6-Oct-**17**	10500	-	500	-	NIL	4000	19500	-	25.6	6.6
7-Oct-**17**	10000	-	500	-	-	4000	19500	-	23.2	6.3
8-Oct-**17**	10000	-	500	-	-	4000	19500	-	21.7	5.0
9-Oct-**17**	10500	-	300	-	-	4000	19500	-	21.2	5.0
10-Oct-**17**	10200	-	300	-	-	4000	19500	-	20.7	7.3
11-Oct-**17**	11100	-	300	-	-	4000	19500	-	23.5	4.4
12-Oct-**17**	9400	-	NIL	-	-	4000	19500	-	22.8	4.0
13-Oct-**17**	9400	-	-	-	-	4200	19500	-	23.5	4.3
14-Oct-**17**	9400	-	-	-	-	4200	19500	-	17.5	3.4
15-Oct-**17**	9000	-	-	-	-	3700	19500	-	17.5	3.0
16-Oct-**17**	11900	-	-	-	-	4000	18000	-	17.2	6.1
17-Oct-**17**	10700	-		-	-	4200	15000	-	17.2	6.7
18-Oct-**17**	11400	-	-	-	-	4200	15000	-	20.0	5.6
19-Oct-**17**	7900	-	-	-	-	4200	15000	-	18.3	3.9
20-Oct-**17**	7900	-	-	-	-	4200	8700	-	20.6	6.7
21-Oct-**17**	7900	5400	-	-	-	4200	11700	-	20.0	5.0
22-Oct-**17**	11400	8900	-	-	-	4200	12400	-	20.0	3.9
23-Oct-**17**	11300	8800	-	-	-	3500	10500	-	19.4	3.3
24-Oct-**17**	15100	12600	-	-	-	3600	10400	-	20.6	3.3
25-Oct-**17**	15000	12500	-	-	-	3500	9500	-	20.0	4.4
26-Oct-**17**	13200	10700	4300	4300	-	3600	6200	-	20.0	3.3
27-Oct-**17**	11500	8900	7500	7500	-	3900	5100	-	21.1	3.9
28-Oct-**17**	12700	10200	7800	7500	-	3700	8400	-	16.7	2.2
29-Oct-**17**	12700	10200	7800	7500	-	3700	14300	-	16.7	1.7
30-Oct-**17**	12700	10200	7800	7500	-	3600	15000	-	18.3	1.1
31-Oct-**17**	13200	10600	7800	7500	-	3500	15000	-	16.1	1.7

Appendix-III

MONTHLY RAINFALL DATA (JULY-SEPTEMBER 2017) (SOURCE: PMD)

RAINFALL (MM) STATEMENT FOR THE MONTH OF JULY-2017

Stations | indicates daily highest rainfall. | No Rain through out the region

	PUNJAB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Monthly Normal	Deviation from normal	Rainy days: Current Month	Rainy days: Historical	Highest Rain in 24 hrs: Current Month	Highest Rain in 24 hrs: Historical
1	BAHAWALNAGAR	0	0	0	0	0	0	9	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.00	70.8	-41.8	2.0	5.6	20.00	125.0
2	BAHAWALPUR,CITY	0	0	0	0	0	0	2	0	0	0	0	0	0.6	0	0	0	0	0	16	0.01	0	0	0	0	0	0	0	0	7	0	0	25.61	40.4	-14.8	5.0	3.3	16.00	67.0
3	BAHAWALPUR,AIRPORT	0	0	0	0	0	0	0	0	0	0	0	0	2.3	0	0	0	0	0	14	0.01	0	0	0	0	0	0	0	0	0.01	0	0	16.32	**	**	4.0	3.0	14.00	37.0
4	BHAKKAR	0	0	0	0	0	0	6	0	0	0	0	0	2	0	0	0	0	0	8	0	0	0	0	0	0	0	0.01	0	0	0	0	16.01	**	**	4.0	11.0	8.00	58.6
5	CHAKWAL	0	0	6.8	0	2.2	0	0.01	0	0	0	0	0	9.4	0	9.2	0	3.2	18.4	0	0	30.6	4.4	4.4	1.6	18.5	0	11.6	8.2	36.2	39.8	0	204.51	**	**	16.0	15.0	39.80	69.0
6	D.G.KHAN	0	0	0	0	0	0	0.01	14	0	0	0	0	20	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0.01	0	0	34.03	39.5	-5.5	5.0	7.0	20.00	49.6
7	FAISALABAD	0	0	0	0	16	0	8	0	0	0	0	0	46	0	0	0	0	0	0	0	1	0	11	0	0	0	0	1	8	0	1	92.00	100.8	-8.8	8.0	8.0	46.00	180.3
8	ISLAMABAD,AIRPORT	0	0	0.01	0	0.01	0.01	0.01	0	0	0.01	34	53	70	0	0	0	5	2	0	0	14	0.01	1	0.01	0.01	2	2	2	0	0.01	42	227.09	307.8	-80.7	20.0	22.0	70.00	200.0
9	ISLAMABAD,ZEROPOINT	0	0	0.01	0	5	0	0	0	0	0.01	38	48	103	0	0	0.01	18.5	3	0.01	0	14	0	9	0.01	1	0.01	0.01	0.01	0	0.01	45	284.59	368.6	-84.0	19.0	19.0	103.00	591.9
14	JHANG	0	0	0	0	0	0	2	0	0	0	0	0	4.2	0	0	0	0	0	2	0	22.4	0	0	0	0	0	0	0	97	0	0	127.60	**	**	5.0	8.0	97.00	71.0
15	JOHARABAD	0	0	0	0	0	0	4.4	0	0	0	0	0	1	0	1	0	5	0.01	1	0	0.01	0	0	0	0.01	0	12.7	2.4	16	4	0	47.53	**	**	12.0	12.0	16.00	95.0
16	JHELUM	0	0	0.6	0	0	0	0.2	0	0	0	1.4	58.2	30.7	1.8	0	0	30.6	30.6	26.2	0	0.01	0	0	0	1.8	2.2	5	38.6	25	6.4	0.01	259.32	243.1	16.2	17.0	14.4	58.20	242.2
17	KASUR	0.01	0	0	0	0	0	18	0	0	0	0	0.01	0.01	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0.01	0	0	0	39.04	**	**	5.0	13.0	21.00	47.0
18	KHANPUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0	0	0	0	0	0	0	0	0	0.01	0.01	0	46.02	33.3	12.7	3.0	3.0	46.00	123.6
19	KOT ADDU	0	0	0	0	0	0	69	0	0	0	0	0	7	0	0	0	0	0	12.2	0	0	0	1.4	0	0	0	1	0	0	0	0	90.60	**	**	5.0	**	69.00	**
20	KAMRA	0	0	0	0	18	0	0	0	0	0	10	22	9	0	0.01	0	0.01	21	0	0	56	0.01	79	0	48	34	23	2	0.01	0.01	10	332.05	216.5	115.6	17.0	**	79.00	240.0
21	LAHORE, AIRPORT	0	0	2	0	1	0	66.2	0	0	0	5	8.4	5	0	8	0	0	10	45	0	0.01	0	0	0	0	0	0	0	0.01	0	2	152.62	196.8	-44.2	12.0	17.0	66.20	332.5
22	LAHORE,CITY	0	0	1	0	0	0	23	0	0	0	0.01	21.6	7.2	0.01	46.6	0	0	1.4	0.4	0	0.01	0	0	0	0	0	0	18	25.2	0	4.7	149.13	190.9	-41.8	13.0	14.0	46.60	207.6
36	LAYYAH	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	1.6	0.01	0	0	0	0	0	0	0	0	0	0	0	0	1.62	**	**	3.0	**	1.60	**
37	MANDIBAHAUDDIN	0	0	0.01	0	14	0	2.5	0	0	0	0	8	83	0.01	0	0	35.4	24	4	0	0	0	0	0	0	0.5	0.01	0	5	0	1	177.83	**	**	13.0	14.0	83.00	130.2
38	MIANWALI	0	0	0	0	13.5	0	0	0	0	0	0	47	0.5	0	14	0	8	0	5	0	0	0	0.01	0.01	0	1	7	0	20	0.01	0	116.03	144.6	-28.6	12.0	**	47.00	149.0
39	MULTAN	0	0	0	0	0	0	2.2	0	0	0	0	0	12	0	0	0	0	0	6.6	0	0	0	0	0	0	0	0	0	9	0	0.01	29.81	49.6	-19.8	5.0	6.0	12.00	127.0
40	MANGLA	0	0	4	0	0.8	0	0	0	0	3	1.8	33	24	0.5	0	0	22	71	17	0	0	0.3	0.01	0	36.7	1.2	5.1	31.8	0	0.01	0.01	252.23	**	**	18.0	21.0	71.00	140.0
41	MURREE	0	0.01	0	3	3	0	0.01	0	0	1	50	42	46	5	1.2	0	1.9	6	0.5	0	6	9	17	3	0	0	3	0	3	8	1	209.62	339.5	-129.9	21.0	23.0	50.00	166.9
42	NOORPUR THAL	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	0	0	5	0	78.00	**	**	4.0	8.0	68.00	116.0
43	OKARA	0	0	0	0	0	0	0	0	0	0	0	0	23	3	0	0	0	0.6	0	0	2.8	0.01	0.2	0	0	0	0	0	0	0	0	29.61	**	**	6.0	8.0	23.00	77.0
44	RAHIM YAR KHAN	0	0	0	0	0	0	6.8	0	0	0	0	0	0	0	0	0	0	0	7.6	0	0	0	0	0	0	0	0	0	1.2	0	0	15.60	**	**	3.0	3.0	7.60	31.0
45	GUJRANWALA	0	0	16	0	46	14	6.4	0	0	0	0	107	61.4	0	0	2	0.01	0.4	1	0	0.01	0	1.4	1	0	16	0	0	0	3	0	275.22	**	**	15.0	15.0	106.60	130.0
46	GUJRAT	0	0	1	6	8.2	0	0.01	0	0	0.6	0	138	35.5	0	0	0	39.4	15.8	4.2	0	0	0	0	0	21	1.5	18	3.5	0	0	38	331.11	**	**	15.0	16.0	138.40	135.0
47	SAHIWAL	0	0	0	0	0	0	3	0	0	0	0	0	0.01	0	0	0	0	1	40	0	9	0	0	0	0	0	0	0	2	0	0	55.01	**	**	6.0	9.0	40.00	78.3
48	SARGODHA A/P	0	0	0	0	18	0	39	0	0	0	0	0	0.01	0	0	0	0	0	3	0	0	0	0	0	0.01	0	11	0.3	3	4	11	89.32	120.8	-31.5	10.0	14.0	39.00	108.0
50	SHORKOT	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0.01	0	0	0	13	0	15	0	0	0	0	0	0	0	2	0	0.01	32.02	95.0	-63.0	6.0	**	15.00	152.0
51	SIALKOT CANTT	0	0	0	4	2	0	1	0	8.4	44.5	1.4	30	17.1	0	0	23.3	0.6	0.2	80	0	0	43.5	26.5	0.01	8	14	0	0.6	45.5	0.01	46	396.82	312.6	84.2	21.0	17.0	80.00	273.7
52	SIALKOT AIRPORT	0	0	9.8	0.4	14.2	0	1	0	1.6	12.8	0.8	113	47.4	0	0	2	10.8	0.4	18.2	0	0	0	0	0.8	0.01	0.01	0	0.01	0.4	0.01	31.8	265.84	**	**	20.0	17.0	113.40	116.0
53	T.T. SINGH	0	0	0	0	0	0	0.6	0	0	0	0	0	4.2	0	0	0	0	0	37.2	0	0.2	0	0	0	0	0	0	0	35	0	0	77.20	**	**	5.0	7.0	37.20	66.3
	G.B / AZAD KASHMIR																																						
54	ASTORE	0	0	0	0	0.2	1.2	0.2	0.2	0	0	0	1	1.8	0	0	0	3.4	1	3	0	0	0	2	0	3	0	0	0	0	0	0	17.00	26.4	-9.4	11.0	11.0	3.40	74.7
55	BUNJI	0	0.01	0	0	0	0.01	0	0	0	0	0	2	2.1	0.8	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0.01	0	4.94	17.9	-13.0	7.0	8.0	2.10	57.7
56	BAGROTE	0	0.6	0.5	0	3.6	0.8	0	0	0	0	0	0.8	8.6	0.6	0	0	0	1.3	0.8	0.01	0	1	16.4	0.01	0.01	0	0	0	0	1	0	36.03	**	**	15.0	**	16.40	**
57	CHILAS	0	0	0	1	0	0.01	0	0	0	0	0	0	0.01	0	0	0	0	0.01	0	0	0	0	0.01	0	0.01	0	0	0	0	0.01	0	1.06	15.3	-14.2	7.0	9.0	1.00	67.9
58	G.DOPATTA	0	0	3.6	1.4	0.01	30	0	0	0	5.7	12.8	5.3	32.8	4.2	0	0	6.9	14.4	1	5.1	0	14	0	0	0	0	7	12	0	3	0	159.21	263.3	-104.1	17.0	18.0	32.80	189.4
59	GILGIT	0	0.01	0.01	0.01	0.7	0.3	0	0	0	0	0	2.3	2.6	2.4	0	0	0.01	0.01	0.01	0	0	0.01	1	0.01	0	0	0	0	0	1	0	10.38	14.7	2.6	15.0	12.0	2.60	38.4
60	GUPIS	0	0	0	0	0	1	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	8.00	19.0	-11.0	3.0	6.0	5.00	37.8
61	KOTLI	0	0	0	11.6	0	0	5.8	0	0	1.2	30	5	12	3.4	8	0	37	1	2	0	9.4	0.01	1	0	1	3	3	4	0	0	1	139.41	284.4	-145.0	19.0	22.0	37.00	326.9
62	MUZAFFARABAD	4	0	8	5	0.01	13	0	0	0	10.6	23.5	22	61	5	0	0	4.5	25	4.4	0	7	11	4	0	6	0	45	0	44	11	1	315.01	349.3	-34.3	20.0	17.6	61.00	177.8
63	RAWALAKOT	0	0	0	0.01	1	0	12	0	8	65.4	119	2.6	15	10	0	0	2	0.4	3.8	0	0	0.01	4.8	0.4	0.01	0	5.8	0	0.8	7.4	0	257.93	**	**	19.0	20.0	118.50	171.2
64	HUNZA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	0.0	9.0	0.00	163.0
65	SKARDU	0	0	0	0	0.01	1.4	0.2	0.01	0	0	0	0	0.6	0	0	0	0	0	0	0.01	0	0	0.2	0	0.01	0.01	0	0	0	0	0	2.45	11.2	-8.8	9.0	10.0	1.40	84.3

K.PAKHTUNKHWA																																								
66	BALAKOT	0	1	6	5	6	0	0	0	8	0	10	6	8.3	0	0	0	21	5	35	0	3	17	5	0	9	0	1	0	1	6.4	0	153.70	324.4	-170.7	18.0	16.0	35.00	291.8
67	BANNU	0	0	0	0	6	0	0	0	0	0	0	0	1.4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	9.40	63.6	-54.2	4.0	4.7	6.00	101.0
68	CHERAT	0	0	0	0	0	0	0	0	0	0	0	0	32	0	12	0	6	0	0	0	1	0	0	0	0	0	7	31	3	0	25	117.00	85.5	31.5	8.0	7.0	32.00	257.0
69	CHITRAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	7.0	1.6	0.0	5.0	0.00	41.4
70	D.I.KHAN	0	0	0.01	0	0	0	8	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	18	1	0	0	0	48.01	69.6	-21.6	5.0	11.0	21.00	116.0
71	DIR	0	0	0	1	0	0	0	7	0	0	0	29	0	0	0	0	7	0	0	1	0	0	6	0	0	0	2	0	6	3	0	62.00	154.5	-92.5	9.0	13.0	29.00	149.0
72	LOWER DIR	0	0	0	0	0	0	0	2	0	0	36	22	0	0	0	0	2	0	0	0	2	0	1	0	0	0	0	0	0	0	0	65.00	**	**	6.0	7.6	36.00	192.0
73	DROSH	0	0	7.6	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	2.7	0	0	0	0	0	0	0	0	0	10.31	21.4	-11.1	3.0	4.7	7.60	61.2
74	KAKUL	5	0	1	0	0	0	1	0	0	0	33	27	17	0.01	0	1	50	10	1	7	26	1	18	0	23	0	8	0	9.5	4	4	246.51	257.5	-11.0	19.0	18.1	50.00	163.6
75	KALAM	0	0	0	12	1	15	0	12	0	0	0	0	7	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	9	5	0	63.00	**	**	9.0	8.0	15.00	84.0
76	KOHAT	0	0	0	0	7	0	2	0	0	0	0	2	2	0	8	0	0.01	0	0	0	0	0	0	0	0.01	0.01	2	3	0	3	0.01	29.04	83.2	-54.2	12.0	**	8.00	233.0
77	M. JABBA	0	3	0	0	4	0	16	0	0	0	17	32	33	0	0	0	35	13	0	6	9	0	28	0	0	0	30	2	0	87	0	315.00	**	**	14.0	16.0	87.00	67.0
78	MIRKHANI	0	0	7	23.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.6	0	0	0	0	0	0	0	0	0	43.00	**	**	3.0	**	23.40	**
79	PARACHINAR	0	0	0	0	0	6	0	7	0	0	0	3	0	30	8	0	5	0	0	25	0	0	3	0	0	0	0	0	0	18	0	105.00	83.5	21.5	9.0	13.0	30.00	134.7
80	PESH A/P	0	0	0	0	0	0	0	0	0	0	0	0.01	41	0	23	0	0.01	2	0	0	0	0	0.01	0	0	0	0	0	0	0	11	77.03	58.3	18.7	7.0	9.0	41.00	113.5
81	PESH CITY	0	0	0	0	0	0	0	0	0	0	0	0.01	44	0	20	0	0.01	11	0	0	0	0	0	0	0	0	0	0	0	0	15	90.02	**	**	6.0	**	44.00	**
82	PATTAN	0	0	0	2	1	0	0	0	0	0	0	5	0.5	0	0	0	0	0	0	1	0	0.01	0	0	0	0	3	0	0	0	0	12.51	**	**	7.0	6.2	5.00	97.1
83	RISALPUR	0	0	0	0	0.01	0	0	0	0	0	40	19	14	0	7	0	0.01	81	0	0	13	0.01	24	0	1	46	0.01	0.01	0	8	64	317.05	143.2	173.9	16.0	**	81.00	280.0
84	SAIDU SHARIF	0	6	24	0	0	0	2	1	0	0	4	14	4	0	0	0	4	1	0	3	2	0	29	0	1	0	0	0	0	2	0	97.00	166.0	-69.0	14.0	13.0	29.00	187.0
SINDH																																								
85	BADIN	0.01	0	0	0	0	0	0	0	0	0	0	0	0.01	0	10	1	1	63	12.2	0.01	0.3	0	0	0	0	0	0	0	0.01	2	0	89.54	79.5	10.0	10.0	6.0	63.00	249.4
86	CHHOR	0	0	0	0	0	0	0	0	0	0	0	0	0	15.8	3	0	2	0	4.5	0	21	0	0	3.7	14.7	0	9	2.2	13	25.5	0	114.40	82.2	32.2	11.0	3.0	25.50	137.2
87	HYDERABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	12	0	2	0	0	8	0	0	0	0	0	0	0	0	0	0	27.00	47.9	-20.9	4.0	2.1	12.00	190.5
88	JACOBABAD	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	12	0	0	0.01	0	15.02	39.0	-24.0	4.0	2.0	12.00	133.0
89	KARACHI A/P	0.01	0	0	0.01	0	0	0.01	0.01	0.01	0.01	2.4	1	0.01	0.2	2	6.2	3	0.2	2.4	15.7	0	0	0	0	0	0	0	0	0	0.01	0	33.38	60.0	-26.6	16.0	14.0	15.70	207.0
90	LARKANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0.01	0	0	0	0	0	0	10.3	0	0	0	0	27.31	48.6	-21.3	3.0	1.3	17.00	165.5
91	MITHI	1.4	5	0	0	0	0	0	0	0	0	0	0	0	21	24.6	3.1	4	1	10.8	3	22	4	37	3.8	0.01	0	0	0.01	5.1	51.4	0	197.22	**	**	16.0	2.0	51.40	**
92	SH.B.ABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	12	0.01	0.01	7.2	6.9	0	0	0	0	0	0	0	0	0	0	0	26.13	58.3	-32.2	6.0	**	12.00	256.5
93	PADIDAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	3	5	0	0	0	0	0	0	1	0	0	0	0	9.02	41.8	-32.8	5.0	2.2	5.00	138.0
94	ROHRI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	12	0	0	0	0	17.00	39.7	-22.7	3.0	2.0	12.00	184.5
95	SUKKUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0.01	0	0	0	0	0	0	0.01	0	0	0	0	10.02	20.8	-10.8	3.0	**	10.00	**
96	M.JO.DARO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	9	0	0	0	0	0	0.01	13.5	0	0	0	0	29.51	39.9	-10.4	4.0	1.9	13.50	69.0
97	THATTA	7.8	0	0	0	0	0	0	0	0	0	0	0	0	0	11.3	19	0	2.2	16.3	23.2	0	0	0	0	0	0	0	0	0	0	0	79.80	**	**	5.0	**	23.20	**
98	DADU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1.00	**	**	1.0	**	1.00	**
99	MIRPUR KHAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	45	0.5	0.01	8	0	25	4	0	0	0.01	0	0	0	0	113.52	**	**	8.0	**	45.00	**
BALOCHISTAN																																								
100	BARKHAN	0	12	0	0	0	0	23	10	0	0	1	8	9	0	0	1	0	11	0	0	0	0	0	8	0	0	0	0	0	2	0	85.00	98.7	-13.7	10.0	7.0	23.00	88.0
101	DALBANDIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	4.0	-4.0	0.0	0.3	0.00	83.8
102	GAWADAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	0.0	**	0.00	**
103	JIWANI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	3.1	-3.1	0.0	0.3	0.00	90.7
104	KALAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	21.9	-21.9	0.0	2.2	0.00	68.6
105	KHUZDAR	0	0	0	0	0	0	0	12	0	7	0	0	3	0	3	17.8	0	0.6	0	0	0	0	30	0	0	0	0	0	3	0	2.4	0	78.80	58.3	20.5	9.0	5.5	30.00	223.0
106	LASBELA	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0.01	7	0	12	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	25.02	51.4	-26.4	6.0	2.4	12.00	135.6
107	NOKKUNDI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.7	-0.7	0.0	1.0	0.00	16.5
108	PANJGUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	11.9	-11.9	0.0	2.0	0.00	68.6
109	PASNI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	6.9	-6.9	0.0	0.7	0.00	119.4
110	Qta. (SH MANDA)	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	**	**	2.0	2.0	0.01	**
111	Qta. (SAMUNGLI)	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	11.2	-11.2	2.0	**	0.01	42.0
112	SIBBI	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	17	0	0	5	0	0	0	0	16	0	0	0	0	0	0	0	38.01	38.4	-0.4	4.0	3.0	17.00	88.9
113	TURBAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	8.1	-8.1	0.0	0.6	0.00	36.6
114	ORMARA	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.00	10.7	-1.7	3.0	0.5	5.00	57.4
115	ZHOB	0	0	2	0	0	0	0	2	0	0	0.01	6	6	0	0	17	10	0	0	0	0	0	0	0	0	0.01	4	0	0	0	0	47.02	66.4	-19.4	9.0	5.0	17.00	73.0

OTHER RAINFALL STATIONS AT ISLAMABAD,LAHORE, MULTAN,DG KHAN AND RAJANPUR & KARACHI

ISLAMABAD REGION		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total						
1	SAID PUR	0	0	0	0	1	0	0	0	0	0	64	61	76	0	0	0	29	5	0	0	107	0	6	0	0	29	0	0	3	61	5	447.00	**	**	**	**	**	SAID PUR
2	SHAMSABAD	0	0	0	0	1	0	0	0	0	0	23	78	97	0	0	0	23	2	0	0	11	1	3	0	0	0	1	0	0	0	46	286.00	**	**	**	**	**	SHAMSABAD
3	GOLRA	0	0	1	0	0	0	0	0	0	0	0	0	52	0	0	0	7	16	0	0	53	0	3	0	0	3	1	0	0	0	14	150.00	**	**	**	**	**	GOLRA
4	BOKRA	0	0	0	0	2	0	0	0	0	0	37	54	35	0	0	0	0	5	0	0	18	0	1	0	0	15	0	0	0	1	8	176.00	**	**	**	**	**	BOKRA
LAHORE REGION																																							
5	SHAHI QILLA	0	0	0	0	0	0	13	0	0	0	0	0	5	0	1	0	0	10	0	0	0.01	0	0	0	0	0	0	35	29	0	0.01	93.02	**	**	**	**	**	SHAHI QILLA
6	MISRI SHAH	0	0	0	0	0	0	12	0	0	0	0	1	9	0	50	0	0	0.01	0	0	0	0	0	0	0	0	0	35	42	0	0.01	149.02	**	**	**	**	**	MISRI SHAH
7	UPPER MALL	0	0	0	0	0	0	32	0	0	0	17	0	3	0	15	0	0	1	0	0	0	0	0	0	0	0	0	0.01	12	0	0	80.01	**	**	**	**	**	UPPER MALL
8	SHAHDARA	0	0	0	0	0	0	12	0	0	0	0	0	12	0	0	0	0	36	0	0	0	0	0	0	0	0	0	17	9	0	0	86.00	**	**	**	**	**	SHAHDARA
9	GULBERG	0	0	1	0	0	0	31	0	0	0	1	0.01	11	2	41	0	0	1	0	0	0	0	0	0	0	0	0	0.01	13	0	16	117.02	**	**	**	**	**	GULBERG
10	LUKSHMI	0	0	0	0	0	0	18	0	0	0	0	24	2	0	11	0	0	3	0	0	0.01	0	0	0	0	0	0	22	50	0	0	130.01	**	**	**	**	**	LUCKSHAMI
11	GULSHAN RAVI	0	0	0	0	0	0	12	0	0	0	0	6	6	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	30	18	0	0	72.01	**	**	**	**	**	GULSHAN RAVI
12	IQBAL TOWN	0	0	0	0	0	0	18	0	0	0	0	5	0.01	6	0	0	0	0	0	0	0	0	0	0	0	0	0	22	47	0	0	98.01	**	**	**	**	**	IQBAL TOWN
13	SAMNABAD	0	0	0	0	0	0	18	0	0	0	0	14	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	24	24	0	18	107.00	**	**	**	**	**	SAMNABAD
14	JOHAR TOW	0	0	0	0	0	0	13	0	0	0	0	0	5	0	0	0	12	11	0	0	0	0	0	0	0	0	0	61	14	0	4	120.00	**	**	**	**	**	JOHAR TOW
15	TOWNSHIP	0	0	2	0	0	0	10	0	0	0	0	0	2	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	25	25	0	15	79.01	**	**	**	**	**	TOWNSHIP
16	MUGAL PURA	0	0	0.01	0	0	0	15	0	0	0	17	6	2	0	15	0	0	0.01	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0.01	55.05	**	**	**	**	**	MUGAL PURA
17	TAJPURA	0	0		0	0	0	27	0	0	0	20	12	1	0	7	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0.01	0	0.01	67.03	**	**	**	**	**	TAJPURA
18	PUNJAB.UNIVERSITY	0	0	7	0	0	0	16	0	0	0	0	0.01	2	9	5	0	7	6	8	0	0.01	0	0	0	0	0	0	47	62	0	1	170.02	**	**	**	**	**	PUNJAB.UNIVERSITY
MULTAN REGION																																							
18	CHUNGI NO.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	36	0	0	40.00	**	**	**	**	**	CHUNGI NO.9
19	MUMTAZABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	**	MUMTAZABAD
20	SHUJAABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7.00	**	**	**	**	**	SHUJAABAD
21	SAMMEJABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	19.00	**	**	**	**	**	SAMMEJABAD
22	KIRICHAMANDAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6	0	0	12.00	**	**	**	**	**	SAMMEJABAD
D.G KHAN & RAJANPUR REGION																																							
23	BELA,VIDORE	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0.01	0	0	11.02	**	**	**	**	**	BELA,VIDORE
24	FORT MUNRO	0	0	0	0	0	2	9	10.2	0.2	0	0	11	8	0	0	0	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	47.40	**	**	**	**	**	FORT MUNRO
25	MARI	0	0	0	0	0	0	0	6.4	0	0	0	1	10	0	0	0	0	18	23	0	0	0	0	0	0	0	0	0	0	0	0	58.40	**	**	**	**	**	MARI
26	VEHOVA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	**	VEHOVA
27	ZAIN SANGHAR	0	0	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	13.00	**	**	**	**	**	ZAIN SANGHAR
28	BAHNDU WALA RAJANPUR	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	36.00	**	**	**	**	**	BAHNDU WALA RAJANPUR
29	MUNAWARA TAWI	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	6	0	0	7.01	**	**	**	**	**	MUNAWARA TAWI
30	ZAIN SANGHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	**	ZAIN SANGHAR
KARACHI REGION																																							
31	FAISAL BASE	0	0	0	0	0	0	0	0	0	0	1	0	0	0.01	0	8	4	0.01	2	22	0	0	0	0	0	0	0	0	0	0	0	37.02	**	**	**	**	**	FAISAL BASE
32	MASROOR	0	0	0	0	0	0	0	0	0	0	2	1	1	0.01	1	6	3	1	0	8	0	0	0	0	0	0	0	0	0	0	0	23.01	**	**	**	**	**	MASROOR
33	LANDHI	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	13	0	0.01	5	56	0	0	0	0	0	0	0	0	0	0	0	74.02	**	**	**	**	**	LANDHI
34	GULSHAN-E-HADEED	0	0	0	0	0	0	0	0	0	0	3	2	0	1	0	15	5	1	9	52	0	0	0	0	0	0	0	0	0	0	0	88.00	**	**	**	**	**	GULSHAN-E-HADEED
35	GULSHAN-E-JOHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	**	GULSHAN-E-JOHAR
36	NORTH KARCHI	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	6	2	0.01	0.01	16	0	0	0	0	0	0	0	0	0	0	0	24.03	**	**	**	**	**	NORTH KARCHI
37	NAZIMABAD	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	5	0	0.01	0.01	10	0	0	0	0	0	0	0	0	0	0	0	17.02	**	**	**	**	**	NAZIMABAD
38	SADDAR	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	3	1	1	1	7	0	0	0	0	0	0	0	0	0	0	0	15.00	**	**	**	**	**	ASDDAR
39	UNIVERSITY ROAD	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	22.00	**	**	**	**	**	UNIVERSITY ROAD

NOTE:** Data notavilable | Historical highest rain in 24 hours upto 2016 | 0.01 Means trace Rainfall

RAINFALL (MM) STATEMENT FOR THE MONTH OF AUGUST-2017

Stations | indicates daily highest rainfall. | No Rain through out the region

	PUNJAB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total	Monthly Normal	Deviation from normal	Rainy days: Current Month	Rainy days: Historical	Highest Rain in 24 hrs: Current Month	Highest Rain in 24 hrs: Historical
1	BAHAWALNAGAR	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	25	25.02	34.2	-9.2	3.0	3.8	25.00	109.0
2	BAHAWALPUR,CITY	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0.03	39.1	-39.1	3.0	2.2	0.01	214.9
3	BAHAWALPUR,AIRPORT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.7	0	0	0.01	0	2.71	**	**	2.0	**	2.70	83.0
4	BHAKKAR	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	2.01	**	**	2.0	**	2.00	57.7
5	CHAKWAL	0.01	64.8	0	2.6	0	0	0	0	0	0	0	0	0	37.8	0	0	0	0	0	1	0	0	12.5	0	16.2	4.4	0	0	0	0	0	139.31	**	**	8.0	**	64.80	108.2
6	D.G.KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0.01	32	71.01	**	**	4.0	**	32.00	93.0
7	FAISALABAD	0.6	4	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	1	37.60	87.0	-49.4	6.0	5.6	25.00	136.0
8	ISLAMABAD,AIRPORT	0.01	24	10	3	0.01	0.01	0	0	0	20	8	0	0	10	0	0	0	0	0	1	0	4	0.01	72	70	0	0	0	16	0	0	238.04	340.3	-102.3	15.0	15.7	72.00	200.0
9	ISLAMABAD,ZEROPOINT	0.01	24	7	3.8	4	0	0	0	2	27	21	0	0	7	0	0	0	0	0	3	0	1	0.01	22	39	0	0	0	0.01	0.01	0	160.84	334.7	-173.9	16.0	15.4	39.00	199.8
10	JHANG	0	0	0	0	0	0	0	0	0	0	0	0	0	29.6	0	0	0	0	0	0	0	0	0.01	0	0	6.8	0	0	0	44.2	69.8	150.41	**	**	5.0	**	69.80	98.2
11	JOHARABAD	2.6	8.2	0	0	0	0	0	0	0	0	0	1	0	28.4	0	0	0	0	0	0.01	0	0	14	0	0.01	29	0	0	0	0.01	8.3	91.53	**	**	10.0	**	29.00	70.0
12	JHELUM	11.8	155	6.3	0	0	0	0	0	0	0	0.6	0.01	0	19.4	0	0	0	0	0	35	0	0	5.2	28.6	33.6	4	0	0	0	0.6	11.6	311.51	231.6	79.9	13.0	13.1	154.80	167.9
13	KASUR	0	0	0	0.8	0	0	2	34	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	15	1	0.01	0	0	11	2	65.82	**	**	9.0	**	34.00	55.0
14	KHANPUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2.4	5.40	33.2	-27.8	2.0	2.0	3.00	125.0
15	KOT ADDU	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6.00	**	**	2.0	**	4.00	49.4
16	KAMRA	35	7	32	39	0.01	0	0	0	0	21	0.01	0	0	4	0	0	0	0	0	16	0.01	39	1	3	12	0	0	0	0	0	2	211.03	276.7	-65.7	15.0	12.9	39.00	200.0
17	LAHORE, AIRPORT	0.01	5	0	0	0	0.01	29	0	0.01	0	0	0	0	9	0	0	0	0	0	0	0.01	0	0	0	0.01	12	7	0	0	20	20	102.05	182.9	-80.9	12.0	11.7	29.00	221.0
18	LAHORE,CITY	0.01	0.01	0.01	0	0	3	12	0	0.2	0	0	0	0	6.2	0	0	0	0.01	0	0	0	0	0	0	5.2	19.4	3.7	0	0	11	9.6	70.34	179.4	-109.1	13.0	12.7	19.40	211.1
19	LAYYAH	0	0	0	0	0	0	0	0	0	0	0	0.5	0	42	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	60.50	**	**	3.0	**	42.00	33.0
20	MANDIBAHAUDDIN	1.6	3.8	0	0	0	0	0	0	0	0	10	0	0	53.6	0	0	0	0	0	21	0	0	0.01	0	73	7.5	0.01	0	0	2.2	5	177.72	**	**	11.0	**	73.00	118.0
21	MIANWALI	42	0.01	0.01	0	0	0	0	0	0	0	0	0.01	0	116	0	0	0	0	0	0	0	0	6	0	6	2	0	0	21	0	0	193.03	115.9	77.1	9.0	8.8	116.00	259.1
22	MULTAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	26.2	30	56.22	41.8	14.4	4.0	2.8	30.00	127.0
23	MANGLA	53	53	24.8	0	0	0	0	0	0	3	1.6	0.01	0	35	0	0	0	0	0	22	0	0	2	45	35	14	0.01	0	0.01	0	9.3	297.73	**	**	15.0	**	53.00	100.0
24	MURREE	22	5	17	0.01	0	0.01	3	0	28	57	19	5	0	5.6	0	0	0	0	0	24	0	0.01	0	0.01	27	0	0	0	46.0	0	3.4	262.04	302.4	-40.4	17.0	17.1	57.00	233.8
25	NOORPUR THAL	0	0	0	0	0	0	0	0	0	0	0	21	0	45	0	0	0	0	0	0	0	0	0	0	0	20	0	0	11	0	1	98.00	**	**	5.0	**	45.00	96.8
26	OKARA	7	0.3	0	0	0	0	0	0	0	0	0	0	0	1.8	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.1	9.22	**	**	6.0	**	7.00	83.3
27	RAHIM YAR KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.00	**	**	1.0	**	1.00	71.0
28	GUJRANWALA	13.6	64	0.8	1.8	0	0	6	0	0	0	0	0	0	37	0.2	0	0	0	0	0	0	0	0	0.01	12.8	17.2	5	0	0	5.4	4	167.81	**	**	13.0	**	64.00	123.3
29	GUJRAT	21	57.5	0	0	12	0	0	0	0	10.2	0.01	0	15.2	25	0	0	0	0	0	0	0	0	0	15	22	33	0	0	0	2.6	1	214.01	**	**	12.0	**	57.50	99.4
30	SAHIWAL	8	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	2	2	17.01	**	**	5.0	**	8.00	138.3
31	SARGODHA A/P	0	0.01	0	0.01	0	0	0	0	0	0	0	0.01	0	27	0	0	0	0	0	0	0	0	0	0	0	27	0.01	0	16	6	18	94.04	109.2	-15.2	9.0	6.5	27.00	176.7
32	SHORKOT	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	9	54.00	57.4	-3.4	3.0	5.0	40.00	121.3
33	SIALKOT CANTT	18	0	51.1	0.9	1	0	0	0	20	39	43.4	0	1	26	0	0	0	0	0	0.01	0	0	0	0.01	5.6	10.2	0.4	0	2	1	0.4	220.02	277.3	-57.3	17.0	14.4	51.10	339.7
34	SIALKOT AIRPORT	39	55.2	39	6.2	9.2	0	0	0	9	3.8	0.6	0	0.4	16.8	0	0	0	0	0	1	0.01	0	0	22.2	78.4	20.4	0.01	0	4.8	7.2	0.4	313.62	**	**	19.0	**	78.40	109.2
35	T.T. SINGH	0	66.2	0	0	0	0	0	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	13.8	3.8	117.81	**	**	5.0	**	66.20	85.0
	G.B / AZAD KASHMIR																																						
36	ASTORE	0	0	11	0	2.5	0	0	0	0.2	0.2	0.6	0	0	0.01	7.1	0	0	0	0	0	0	0	0	0	0	3.2	0	0	0	0	0	24.81	25.3	-0.5	8.0	6.6	11.00	58.5
37	BUNJI	0	0	0.01	0.01	2.8	0	0	0	0.01	0.01	0	0.01	0	0	10	6.7	0.01	0	0	0.01	0.01	0	0	0	0	0.01	0.01	0	0	0	0	19.60	24.5	-4.9	13.0	5.2	10.00	39.0
38	BAGROTE	0	0	0.01	7.4	0.4	0	0	0	0.01	2.4	3	1	0	0	13.5	0.01	0	0	0	0.01	0.01	0	0	0.6	8.8	10.2	0.5	0.6	0	0.01	0	48.46	**	**	17.0	**	13.50	8.8
39	CHILAS	0	0	3	4	0.01	0	0	0	0	5	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.01	17.5	-1.5	6.0	5.4	5.00	51.8
40	G.DOPATTA	0	5.2	6.7	10	0	4	0	6	1	0	5	7.7	0	8.2	3.4	0	0	0	0	1.6	25	15.4	0	0	7	0	0	0	0	0	0	106.20	210.5	-104.3	14.0	14.2	25.00	151.4
41	GILGIT	0	0	0.01	0	0.01	0	0	0	0.01	0	0.6	1	0	0.01	6.8	0	0	0	0	0	0	0	0	0	0.8	1.1	0	0	0	0	0.01	10.35	15.6	-5.3	10.0	5.2	6.80	48.7
42	GUPIS	0	0	0	1	0	0	0	0	0	0	0.6	0	0	7	3	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	15.60	29.0	-13.4	6.0	2.2	7.00	100.0
43	KOTLI	6	27	2	0	1	12	0	2	2	28	10.4	6.2	0	19.8	0	0	0	0	0	14.6	0	0	0	0	35	1.6	0	0	0	0	1	168.60	251.8	-83.2	15.0	14.4	35.00	333.5
44	MUZAFFARABAD	37	27	16	0	0	0	0	0	12	0	0	8.5	0	15.5	0	0	0	0	0	8	0	0	0	0	11	0	0	0	0	12	0	147.00	213.2	-66.2	9.0	15.6	37.00	133.3
45	RAWALAKOT	0.01	5.8	15	0	0	0	0	0.01	0	24	12.4	10.2	0	12.2	0	0	0	0	0	0.01	0	0	0.01	0.01	38	0	0	0	0.01	1.2	4.2	123.06	**	**	15.0	**	38.00	135.9
46	HUNZA	0	0	0	0	0	0	0	0	0.01	0	0.01	0.01	0	3.2	19	2.8	0	0	0	0	0	0	0	0	5.6	2	0.01	0	0	0	0	32.64	**	**	9.0	**	19.00	42.0
47	SKARDU	0	0	6.2	0	0	0	0	0	0	1	0.8	0	0.01	0	0.01	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	8.22	13.2	-5.0	6.0	5.8	6.20	139.7

K.PAKHTUNKHWA																																							
48	BALAKOT	0	0	2	0	0	0	16	36	9	11.2	4	6	0	6.4	0	0	0	0	0	5	0	0	0	0	33	2	0	0	12	3	0	145.60	265.5	-119.9	13.0	5.0	36.00	245.0
49	BANNU	40	82	0	0	0	0	0	0	0	0	0	1	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	142.00	74.3	67.7	4.0	4.8	82.00	90.0
50	CHERAT	1	7	3	0	0	0	0	0	0	0	0.01	0	0	12	0	0	0	0	0	11	0	0	1	0	6	0	0	0	0	0	7	48.01	94.2	-46.2	9.0	6.9	12.00	217.0
51	CHITRAL	0	0	0.01	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0.01	0	0	0	0	0.01	0.1	0	0	0	0	0	0	2.13	6.6	-4.5	5.0	2.5	2.00	17.0
52	D.I.KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	77	0	0	0	0	0	77.01	73.7	3.3	2.0	6.0	77.00	150.0
53	DIR	0	9	5	16	0	0	0	0	0	0	19	0	0	0	10	0	2	0	3	4	0	0	0	0	28	10	0	0	0	0	0	106.00	147.5	-41.5	10.0	11.0	28.00	81.8
54	LOWER DIR	0	0	0	0	0	0	0	0	0	4	5	0	0	4	0	0	0	0	0	1	0	0	0	0	1	0	0	12	16	0	0	43.00	**	**	7.0	**	16.00	81.0
55	DROSH	0	0	0	0	0	0	0	0	0	0	0.4	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0.3	0	0	0	4.70	18.3	-13.6	4.0	4.0	3.00	115.6
56	KAKUL	4.5	0.01	2	0.01	0	0	14	0	4	28	8	0.01	0	31	0	0	0	0	0	64	0	0	0	0	30	0	0	0	0	0.01	50.5	236.04	235.6	0.4	14.0	17.0	64.00	140.4
57	KALAM	0	0	0	0	0	0	3	0	0	0	7	0	0	6	8	0	0	0	0	0	0	0	0	0	1	1.3	0	3.5	0	0	0	29.80	**	**	7.0	**	8.00	44.0
58	KOHAT	2	81	10	0	0	0	0	0	0	0	0	0	12	30	0	0	0	0	0	10	0	2	0.01	0	8	0	0.01	0	0	0	0	155.02	103.3	51.7	10.0	8.7	81.00	115.0
59	M. JABBA	0	45	42	8	8	0	0	0	0	17	71	55	0	38	18	0	0	0	16	63	0	0	0	0	10	0	0	0	4	0	0	395.00	**	**	13.0	**	71.00	88.2
60	MIRKHANI	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	6.00	**	**	2.0	**	4.00	18.0
61	PARACHINAR	0	5	0	12	3	3	0	0	0	4	5	0	0	0	10	0	0	0	12	0	0	0	10	0	0	0	0	0	0	0	0	64.00	110.7	-46.7	9.0	11.4	12.00	106.7
62	PESH A/P	0.01	28	0.01	0	0	0	0	0	0	0.01	0	0	0	36	0	0	0	0	0	0.01	0	0	0	0	2.7	0	0	0	0	0	0	66.74	77.1	-10.4	7.0	7.8	36.00	150.9
63	PESH CITY	0.01	43	0.01	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	83.02	**	**	5.0	**	43.00	54.0
64	PATTAN	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	10	0	0	0	0	6	1	0	0	18	0	0	44.00	**	**	6.0	**	18.00	62.0
65	RISALPUR	12	10	41	7	0	0	0	0	0	0	0	0	0	45	0	0	0	0	0	29	0	30	2	1	24	0	0	0	0	0	0	201.00	151.6	49.4	10.0	10.9	45.00	132.0
66	SAIDU SHARIF	0	0	0.01	0	0	0	0	0	0	46	3	52	0	4	13	0	0	0	0	16	0	0	0	0	5	0	0	0	2	0	0	141.01	124.7	16.3	9.0	11.2	52.00	136.5
SINDH																																							
67	BADIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	38	0	0	0	0	0	0.01	0.01	12.5	53.52	85.9	-32.4	5.0	2.4	38.00	241.0
68	CHHOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.6	8.2	0	0	0	0	0	0	5.5	3.4	20.70	81.8	-61.1	4.0	3.2	8.20	214.6
69	HYDERABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3	0	0	0	0	0	0	0	64	75.00	71.8	3.2	3.0	2.2	64.00	129.0
70	JACOBABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	35.6	-35.6	0.0	1.2	0.00	251.5
71	KARACHI A/P	0.01	0.01	0.01	0	0	0	0.01	0.01	0.01	0.2	0.4	0	0.6	0.01	0	0	0	0.01	0	0	0	12	26.2	0	0.01	0.01	0.01	0	0	0.01	26.2	65.72	60.9	4.8	18.0	3.3	26.20	166.0
72	LARKANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	34.5	-34.5	1.0	1.2	0.01	131.0
73	MITHI	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1.8	14	0	0	0	0	0	0	5.4	29	51.20	**	**	5.0	**	29.00	**
74	SH.B.ABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	43.00	48.8	-5.8	1.0	1.4	43.00	117.1
75	PADIDAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	1.5	1.51	40.9	-39.4	2.0	1.9	1.50	143.0
76	ROHRI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0.01	24.8	-24.8	1.0	0.6	0.01	139.7
77	SUKKUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.00	20.4	-19.4	1.0	0.6	1.00	**
78	M.JO.DARO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9.00	26.6	-17.6	1.0	1.4	9.00	119.6
79	THATTA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	10	0	0	0	0	0	0	7	46	85.00	**	**	4.0	**	46.00	**
80	DADU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2.00	**	**	1.0	**	2.00	**
81	MIRPUR KHAS	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	16.6	0	0	0	0	0	0.01	0.01	35	73.63	**	**	6.0	**	35.00	**
BALOCHISTAN																																							
82	BARKHAN	0	0	0	0	0	2	0	0	2	0	0	0	4	17	5	0	0	0	0	0	0	19	0	0	0	0	10	0	0	0	1	60.00	89.6	-29.6	8.0	4.6	19.00	104.2
83	DALBANDIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.7	-0.7	0.0	0.1	0.00	41.9
84	GAWADAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	0.0	**	0.00	0.0
85	JIWANI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	2.6	-2.6	0.0	0.5	0.00	32.3
86	KALAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	11.8	-11.8	0.0	1.3	0.00	46.2
87	KHUZDAR	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7	0	0	0	0	0	0	0	14.70	59.9	-45.2	2.0	3.9	13.00	60.2
88	LASBELA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	10	0	0	0	0	0	0.01	0.01	15.02	32.7	-17.7	4.0	2.1	10.00	62.7
89	NOKKUNDI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.3	-0.3	0.0	0.1	0.00	10.7
90	PANJGUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	7.5	-7.5	0.0	0.6	0.00	87.1
91	PASNI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	7.6	-7.6	0.0	0.1	0.00	140.7
92	Qta. (SH MANDA)	0	0	0	0	0	0	0	0	0	0	0	**	**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	0.0	**	0.00	1.0
93	Qta. (SAMUNGLI)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	13.1	-13.1	0.0	1.9	0.00	102.0
94	SIBBI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	39.2	-39.2	1.0	1.8	0.01	79.0
95	TURBAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	1.4	-1.4	0.0	0.3	0.00	59.4
96	ORMARA	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	4.5	-3.5	1.0	0.3	1.00	60.2
97	ZHOB	0	0	0	0	0	0	0	0	5	0	6	0	15	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	33.00	44.8	-11.8	4.0	3.7	15.00	120.0

OTHER RAINFALL STATIONS AT ISLAMABAD,LAHORE, MULTAN & KARACHI

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total					Highest Rain in 24 hrs	
ISLAMABAD REGION																																							
1	ISB. SD. PUR	8	13	4	1	0	0	0	0	39	43	32	0	0	8	0	0	0	0	0	6	0	12	0	3	23	0	0	0	0	2	0	194.00	**	**	**	**	43.00	ISB. SD. PUR
2	ISB.SH.ABAD	0	42	9	3	1	0	0	0	0	25	13	0	0	6	0	0	0	0	0	0	0	1	0	54	86	0	0	0	7	0	0	247.00	**	**	**	**	86.00	ISB.SH.ABAD
3	ISB. GOLRA	3	53	25	8	35	0	0	0	0	19	27	0	0	8	0	0	0	0	0	0	0	1	0	36	50	0	0	0	0	18	0	283.00	**	**	**	**	53.00	ISB. GOLRA
4	ISB.BOKRA	0	16	45	5	2	0	0	0	0	5	8	0	0	6	0	0	0	0	0	0	0	0	0	45	85	0	0	0	27	0	0	244.00	**	**	**	**	85.00	ISB.BOKRA
LAHORE REGION																																						
5	SHAHI QILLA	0	0	0	0	0	0	0	0	5	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	27	3	0	0	8	5	57.00	**	**	**	**	27.00	SHAHI QILLA
6	MISRI SHAH	0	0	0	0	0	0	0	0	4	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	3	20	2	0	0	6	8	53.00	**	**	**	**	20.00	MISRI SHAH
7	UPPER MALL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3	0	0	21	10	42.00	**	**	**	**	21.00	UPPER MALL
8	SHAHDARA	0	0	0	0	0	0	0	0	18	0	0	0	0	2	0	0	0	0	0	4	0	0	0	0	0	14	2	0	0	14	0.01	54.01	**	**	**	**	18.00	SHAHDARA
9	GULBERG	0	0	0	0	0	0	1.5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	21	4	0	0	8	8	44.50	**	**	**	**	21.00	GULBERG
10	LUCKSHAMI	0	0	0	0	0	0.01	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	25	2	0	0	22	15	65.02	**	**	**	**	25.00	LUCKSHAMI
11	GULSHAN RAVI	0	0	0	0	0	0	3	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	2	0	0	12	5	51.00	**	**	**	**	24.00	GULSHAN RAVI
12	IQBAL TOWN	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	43	2	0	0	12	4	61.02	**	**	**	**	43.00	IQBAL TOWN
13	SAMNABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	39	2	0	0	14	7	69.00	**	**	**	**	39.00	SAMNABAD
14	JOHAR TOWN	0	0	0	0	0	0	12	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	68	2	0	0	31	0	138.00	**	**	**	**	68.00	JOHAR TOW
15	TOWNSHIP	0	0	0	0	0	0	15	0	1	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	55	0.01	0	0	8	0	87.01	**	**	**	**	55.00	TOWNSHIP
16	MUGAL PURA	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	5	0	0	12	20	53.00	**	**	**	**	20.00	MUGAL PURA
17	TAJPURA	0	0	0	0	0	0	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	7	0	0	14	25	63.00	**	**	**	**	25.00	TAJPURA
18	PUNJAB.UNIVERSITY	0	0	0.01	0	0	0	12	0	10	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	2	50	20	0	0	20	1	127.01					50.00	PUNJAB.UNIVERSITY
MULTAN REGION																																						
18	CHUNGI NO.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	37	60.00	**	**	**	**	37.00	CHUNGI NO.9
19	MUMTAZABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	18	30.00	**	**	**	**	18.00	MUMTAZABAD
20	SHUJAABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	19	32.00	**	**	**	**	19.00	SHUJAABAD
21	SAMMEJABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	16	40.00	**	**	**	**	24.00	SAMMEJABAD
D.G KHAN & RAJANPUR REGION																																						
22	BELA,VIDORE	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	0	11	43.00	**	**	**	**	31.00	BELA,VIDORE
23	FORT MUNRO	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	1	0	2	0.01	10	0	8	28.01	**	**	**	**	10.00	FORT MUNRO
24	MARI	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	8	0	0	0	0	0	0	0	0	19	0	11	0	4	0	2	45.00	**	**	**	**	19.00	MARI
25	VEHOVA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	VEHOVA
26	ZAIN SANGHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2.00	**	**	**	**	1.00	ZAIN SANGHAR
27	BAHNDU WALA RAJANPUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	BAHNDU WALA RAJANPUR
28	MUNAWARA TAWI BARNALA	0	0	0	0	0	0	0	0	1.6	0	0	0	0	18	0	0	0	0	0	27	0	0	0	0	24	11	0	0	22	2	2	107.60	**	**	**	**	27.00	MUNAWARA TAWI BARNALA
29	ZAIN SANGHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	ZAIN SANGHAR
KARACHI REGION																																						
30	FAISAL BASE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	33	0	0	0	0	0	0.01	29	91.01	**	**	**	**	33.00	FAISAL BASE
31	MASROOR	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	26	22	0	0	0	0	0	4	42	94.01	**	**	**	**	42.00	MASROOR
32	LANDHI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	25	0	0	0	0	0	0	20	82.00	**	**	**	**	37.00	LANDHI
33	GULSHAN-E-HADEED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0	0	0	0	16	48.00	**	**	**	**	32.00	GULSHAN-E-HADEED
34	GULISHTAN-E-JOHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	GULISHTAN-E-JOHAR
35	NORTH KARACHI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	97	114.00	**	**	**	**	97.00	NORTH KARACHI
36	NAZIMABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	10	0	0	0	0	0	0	67	108.00	**	**	**	**	67.00	NAZIMABAD
37	SADDAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	0	0	9	40	70.00	**	**	**	**	40.00	SADDAR
38	UNIVERSITY ROAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0	0	1	27	61.00	**	**	**	**	33.00	UNIVERSITY ROAD
39	MODEL OBSERVATORY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	MODEL OBSERVATORY

NOTE: ** Data notavilable | Historical highest rain in 24 hours upto 2016 | 0.01 Means trace Rainfall

RAINFALL (MM) STATEMENT FOR THE MONTH OF SEPTEMBER-2017

Stations | indicates daily highest rainfall. | No Rain through out the region. | Rainy days | Highest Rain in 24 hrs

	PUNJAB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total Till Date	Monthly Normal	Deviation from	Current Month	Historical	Current Month	Historical
1	BAHAWALNAGAR	5	0	0	0	39.0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47.00	14.9	32.1	3.0	1.9	39.0	94.0
2	BAHAWALPUR,CITY	8	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.01	16.5	-8.5	2.0	0.8	8.0	86.0
3	BAHAWALPUR,AIRPORT	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.00	**	**	1.0	1.7	25.0	87.0
4	BHAKKAR	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.01	**	**	3.0	3.2	1.0	56.0
5	CHAKWAL	0	5.4	0	36	0	0	4.2	0	0	0	10.6	0	0	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58.60	**	**	5.0	5.3	36.0	67.0
6	D.G.KHAN	7	1	0	0	0	0	3	0	0	0	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.02	**	**	5.0	2.3	7.0	76.0
7	FAISALABAD	3.6	0	9	21	0	0	13	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.60	42.5	7.1	5.0	2.8	21.0	264.2
8	ISLAMABAD,AIRPORT	3	13	0	1	3	0	0	0.01	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34.01	110.7	-76.7	6.0	8.5	14.0	168.4
9	ISLAMABAD,ZEROPOINT	0	49.0	0	0	0	0	0	0	0	0	43.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92.00	123.3	-31.3	2.0	8.1	49.0	243.0
10	JHANG	3.4	0	32.8	0	0	0	0	0	0	0	0	0	0	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37.60	**	**	3.0	3.1	32.8	50.1
11	JOHARABAD	0	5.6	0	29.2	0	4.4	2	0	0	0	0.8	0	0	29.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71.00	**	**	6.0	3.0	29.2	44.0
12	JHELUM	52	6	2	0	4	0	0	0	0	0	3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67.10	65.4	1.7	5.0	6.5	52.0	135.4
13	KASUR	0.01	0	0	0.01	0.01	0	0.01	0	0	0	3	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.04	**	**	7.0	**	3.0	129.2
14	KHANPUR	45.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45.6	12.0	33.6	1.0	0.8	45.6	173.0
15	KOT ADDU	27.4	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.41	**	**	2.0	**	27.4	**
16	KAMRA	0	30	19	3	0	1	0	0	0	0	5	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58.01	88.8	-30.8	6.0	8.0	30.0	105.0
17	LAHORE, AIRPORT	0.01	9.8	0.01	0.01	1	0	30.5	0	0	0	0.01	0	0	0.01	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	41.36	74.6	-33.2	9.0	6.5	30.5	278.6
18	LAHORE,CITY	0.0	19.0	0	0	0	0	24.2	0	0	0	0.01	0	0	0.2	0	0	0	0	0	0.01	0	8.8	0	0	0	0	0	0	0	0	52.23	60.4	-8.2	7.0	6.8	24.2	228.1
19	LAYYAH	4	0	0	0	0	0.3	0	0	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.30	**	**	3.0	**	21.0	**
20	MANDIBAHAUDDIN	0.01	6	0	10	0.01	0	0.01	0	0	0	9	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.04	**	**	7.0	**	10.0	119.4
21	MIANWALI	0	0	0	61.0	0	0	0	0	0	0	3	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73.0	53.1	19.9	3.0	4.5	61.0	97.7
22	MULTAN	12.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.20	24.6	-12.4	1.0	1.5	12.2	134.2
23	MANGLA	21	25	0	0	23	0	0	0	0	0	7.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76.30	**	**	4.0	**	25.0	251.3
24	MURREE	16	10	4	0	0	0.01	5	6	0.01	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1.4	0	0	0	0	56.42	130.9	-74.5	10.0	9.1	16.0	255.0
25	NOORPUR THAL	5	2	12	7	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.00	**	**	5.0	4.0	12.0	74.2
26	OKARA	16	0	7	0	1	0	1.8	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.81	**	**	5.0	4.4	16.0	116.0
27	RAHIM YAR KHAN	27	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.02	**	**	3.0	1.1	27.0	96.4
28	GUJRANWALA	30	10	0	0	1	0	7.8	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4.5	0	0	0	56.30	**	**	7.0	9.3	30.0	173.3
29	GUJRAT	12.6	0	0	0	0	0	0	0	0	0	5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.20	**	**	2.0	9.0	12.6	114.2
30	SAHIWAL	43	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44.00	**	**	2.0	3.1	43.0	94.0
31	SARGODHA A/P	4	12	2	27	0	0	9	0	0	0	0.01	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76.0	37.0	39.0	7.0	4.2	27.0	66.0
32	SHORKOT	6	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.01	24.1	-18.1	2.0	2.3	6.0	120.0
33	SIALKOT CANTT	4.4	0.01	32	0	5	0	0.01	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41.82	89.0	-47.2	6.0	6.5	32.0	207.5
34	SIALKOT AIRPORT	11.2	4.8	0	0	9.2	0	0.2	0	0	0	0.4	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.81	**	**	6.0	7.3	11.2	142.6
35	T.T. SINGH	8.1	0	0	0.4	1	0	24	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33.51	**	**	5.0	4.0	24.0	97.0
	GILGIT B./AZAD KASHMIR																																					
36	ASTORE	1	7.2	1	0.6	0	0	0.01	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.61	20.9	-10.3	7.0	4.1	7.2	118.2
37	BUNJI	0	3.6	0.01	0	0	0.01	0.01	0	0	0	0.01	2.6	0.01	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.25	11.2	1.1	8.0	2.7	6.0	53.8
38	BAGROTE	1	0.01	0.01	0.4	0	0.01	0.01	0	0	0	5	3.4	0.01	0	1.8	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	11.95	**	**	11.0	**	5.0	**
39	CHILAS	0	0	0	0	0	0.01	0.01	0	0	0	0.6	0.01	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.63	8.7	-3.1	5.0	3.1	5.0	109.3
40	G.DOPATTA	1	43.5	0	1	0	0	20.1	0	0	0	27.7	0	0	14.2	0	0	0	0	0	0	0	2.4	0	0	0	0	0	0	0	0	109.90	98.2	11.7	7.0	6.9	43.5	257.1
41	GILGIT	0.01	0.01	0	0.2	0	0	0.01	0	0	0	1.9	0.01	0	0.01	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.95	8.6	-5.7	8.0	3.4	1.9	52.6
42	GUPIS	0	0	0	0	0	3	0	0	0	0	0	0	0.01	0	1	0.01	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6.02	15.0	-9.0	5.0	1.6	3.0	68.5
43	KOTLI	57.0	2	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65.00	84.3	-19.3	3.0	7.1	57.0	188.0
44	MUZAFFARABAD	3	10	0	0	0	0	7.5	0	0	0	16	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37.50	109.6	-72.1	5.0	8.3	16.0	200.5
45	RAWALAKOT	18.2	1.8	0	0	0	0	0.8	8.0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45.80	**	**	5.0	8.4	18.2	234.0
46	HUNZA	0	0	0	0	0	0	0.01	0	0	0	0.6	0.01	1.8	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.44	**	**	6.0	6.9	1.8	185.0
47	SKARDU	3	3.4	2	0.01	0	0	11.3	0	0	0	0.3	0	0	0	0.01	0	0.01	1.0	0	0	0	0	0	0	0	0	0	0	0	0	21.03	9.9	11.1	9.0	3.1	11.3	40.6

	K.PAKHTUNKHWA																																				
48	BALAKOT	0	25	0	0	0	15	0	0	0	0	22	0	0	0	0.01	0	0	0	0	0	0	0	0	7.4	0	0	0	0	0	69.41	112.5	-43.1	5.0	2.4	25.0	181.2
49	BANNU	0	2	4	0	0	28	0	0	0	0	7	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44.00	31.4	12.6	5.0	2.6	28.0	98.6
50	CHERAT	0	9	0	0	0	2	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9.0	0	0	0	0	0	29.00	35.1	-6.1	4.0	3.3	9.0	97.5
51	CHITRAL	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2.2	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	4.40	13.1	-8.7	3.0	2.9	2.2	40.5
52	D.I.KHAN	0	0	0	0	0	0.01	0.01	0	0	0	0.01	0	0	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	31.2	-31.2	5.0	2.3	0.0	70.0
53	DIR	0	0	0	0	0	0	14	0	0	25.0	29	2	18.0	6	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	96.00	76.0	20.0	8.0	8.1	29.0	98.0
54	LOWER DIR	0	1	0	0	0	0	1	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.00	**	**	3.0	5.9	7.0	35.0
55	DROSH	0	40	0	0	0	0	0	0	0	0	4	0	0	0	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46.6	20.8	25.8	3.0	4.6	40.0	95.3
56	KAKUL	27	40	0	0	0	1	0	1	0	0	2	0	0	0	0.01	0	0	0	0	0	0	0	0	1	0	0	0	0	0	72.01	100.6	-28.6	7.0	8.7	40.0	243.0
57	KALAM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.70	**	**	2.0	**	1.7	44.0
58	KOHAT	0	0	0	0	0	35.0	0	0	0	0	26	0	0	4	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	70.00	45.1	24.9	5.0	5.6	35.0	75.0
59	M. JABBA	6	35	0	0	0	9	0	0	0	0	11	0	0	9	26	0	0	0	0	0	0	0	10.0	0	0	0	0	0	0	106.00	**	**	7.0	**	35.0	61.0
60	MIRKHANI	0	0	0	0	0	0	0	0	0	0	4.6	0	0	0	6.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.20	**	**	2.0	**	6.6	**
61	PARACHINAR	3	0	0	0	0	9	0	0	0	0	0	6	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.00	53.9	-33.9	4.0	7.6	9.0	90.2
62	PESHAWAR,AIRPORT	0	5	0	0	0	0.01	0	0	0	0	5	0	0	16	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36.01	29.4	6.6	5.0	4.6	16.0	65.0
63	PESHAWAR,CITY	0	3	0	0	0	0.01	0	0	0	0	3	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.01	**	**	5.0	**	3.0	**
64	PATTAN	0	0	0	3	0	0	0	0	0	0	2	17.0	0	0	15	0	6.0	0	0	0	0	0	1	0	0	0	0	0	1.0	45.00	**	**	7.0	**	17.0	51.2
65	RISALPUR	0	0	8	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13.00	49.5	-36.5	3.0	5.4	8.0	70.0
66	SAIDU SHARIF	2	7	0	0	0	2	0.01	0	0	0	0.5	0	0	0	44.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55.51	73.0	-17.5	6.0	6.9	44.0	72.1
	SINDH																																				
67	BADIN	22	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.0	24.8	7.2	2.0	0.7	22.0	159.3
68	CHHOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	39.8	-39.8	0.0	1.2	0.0	81.3
69	HYDERABAD	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	13.0	-13.0	1.0	0.6	0.0	250.7
70	JACOBABAD	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	5.3	-5.3	1.0	0.3	0.0	85.1
71	KARACHI A/P (MOS)	22	4.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26.4	11.0	15.4	2.0	0.7	22.0	111.8
72	LARKANA	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.00	3.7	-1.7	1.0	0.2	2.0	72.0
73	MITHI	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3.5	0	0	0	0	0	0	0	0	0	0	10.50	**	**	4.0	**	4.0	**
74	SH.B.ABAD	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.00	16.1	-14.1	1.0	0.6	2.0	143.0
75	PADIDAN	8	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.0	5.4	2.6	2.0	0.3	8.0	124.5
76	ROHRI	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.0	3.0	6.0	1.0	0.2	9.0	64.6
77	SUKKUR	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.0	0.9	**	1.0	0.1	16.0	**
78	MOIN JO DARO	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.00	6.6	-3.6	1.0	0.3	3.0	83.3
79	THATTA	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.00	**	**	1.0	**	15.0	**
80	DADU	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.00	**	**	1.0	**	18.0	**
81	MIRPUR KHAS	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	**	**	2.0	**	0.0	**
BALOCHISTAN																																					
82	BARKHAN	0	8	0	9	0	0	8	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.01	34.7	-9.7	4.0	2.5	9.0	97.1
83	DALBANDIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.1	-0.1	0.0	0.1	0.0	4.0
84	GAWADAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	0.0	**	0.0	**
85	JIWANI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.0	0.0	0.0	0.0	0.0	5.6
86	KALAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.6	-0.6	0.0	0.1	0.0	26.7
87	KHUZDAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	8.0	-8.0	0.0	1.5	0.0	30.5
88	LASBELA	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.00	5.5	-0.5	1.0	0.2	5.0	82.5
89	NOKKUNDI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.0	0.0	0.0	0.0	0.0	0.1
90	PANJGUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	2.1	-2.1	0.0	0.4	0.0	24.1
91	PASNI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.7	-0.7	0.0	0.2	0.0	12.0
92	QUETTA,SHAIKHMANDA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	0.0	**	0.0	**
93	QUETTA,SAMUNGLI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	2.3	-2.3	0.0	0.4	0.0	28.0
94	SIBBI	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28.0	10.7	17.3	1.0	0.7	28.0	75.7
95	TURBAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.0	0.0	0.0	0.1	0.0	2.0
96	ORMARA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.0	0.0	0.0	0.0	0.0	29.2
97	ZHOB	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.00	9.0	-7.0	1.0	0.9	2.0	58.9

OTHER RAINFALL STATIONS AT ISLAMABAD,LAHORE, MULTAN,D.G KHAN , RAJANPUR & KARACHI REGION

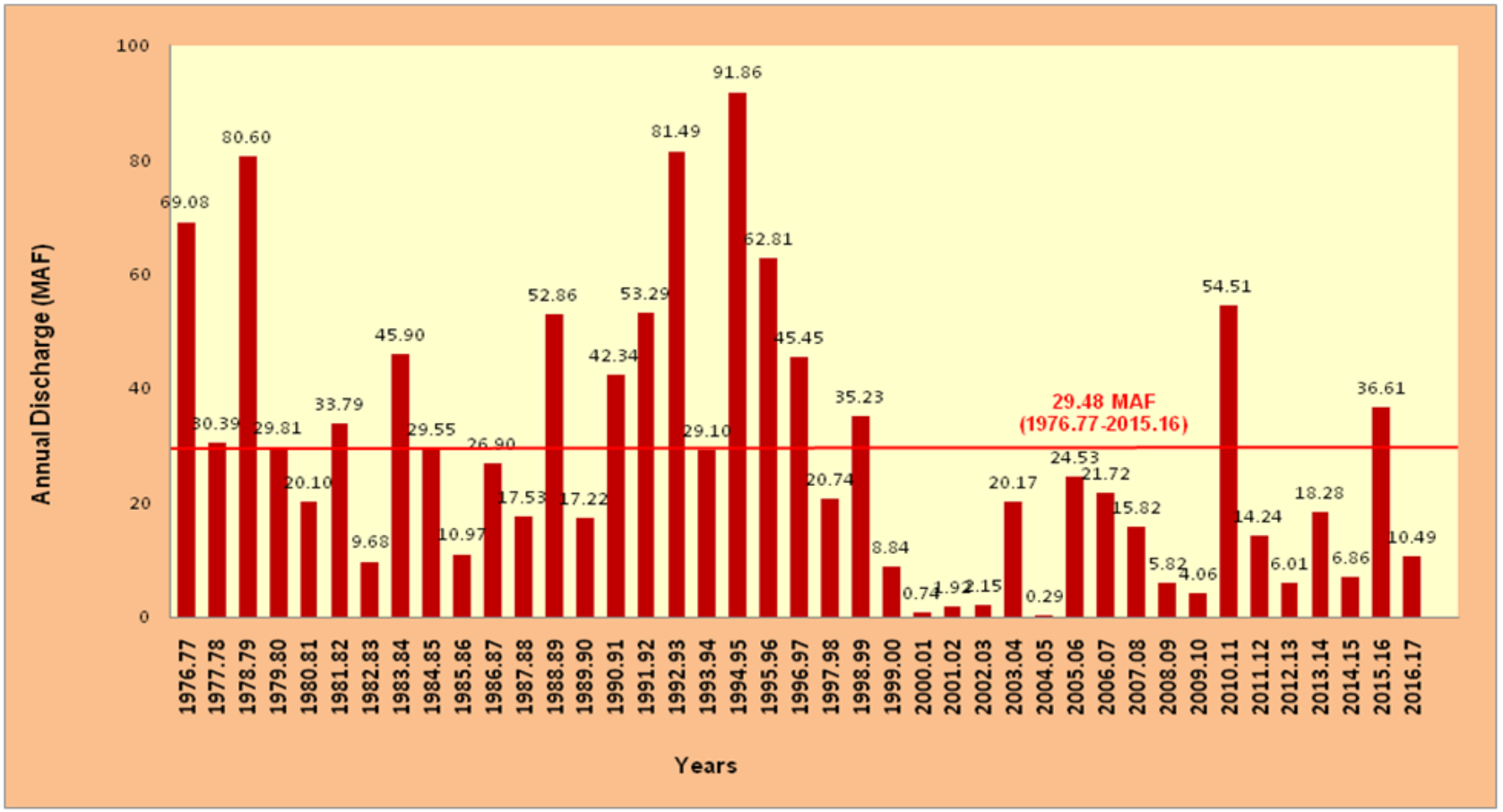
	ISLAMABAD REGION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total					Highest Rain in 24 hrs	
1	ISB. SD. PUR	0	45	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81.00	**	**	**	**	45.00	ISB. SD. PUR
2	ISB.SH.ABAD	0	24	0	0	1	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46.00	**	**	**	**	24.00	ISB.SH.ABAD
3	ISB. GOLRA	0	20	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.00	**	**	**	**	23.00	ISB. GOLRA
4	ISB.BOKRA	0	46	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57.00	**	**	**	**	46.00	ISB.BOKRA
	LAHORE REGION																																					
5	SHAHI QILLA	0	0.01	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.01	**	**	**	**	21.00	SHAHI QILLA
6	MISRI SHAH	0	5	0	0	0	0	21	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28.00	**	**	**	**	21.00	MISRI SHAH
7	UPPER MALL	0	7	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	34.00	**	**	**	**	25.00	UPPER MALL
8	SHAHDARA	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.00	**	**	**	**	20.00	SHAHDARA
9	GULBERG	0	7	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	3	15	0	0	0	0	0	0	0	0	65.00	**	**	**	**	40.00	GULBERG
10	LUKSHMI	0	6	0	0	0	0	22	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.00	**	**	**	**	22.00	LUCKSHAMI
11	GULSHAN RAVI	0	3	0	0	0	0	33	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38.00	**	**	**	**	33.00	GULSHAN RAVI
12	IQBAL TOWN	0	5	0	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.01	0	0	0	0	0	0	0	67.01	**	**	**	**	60.00	IQBAL TOWN
13	SAMNABAD	0	20	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	44.00	**	**	**	**	20.00	SAMNABAD
14	JOHAR TOWN	0	10	0	0	12	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	54.00	**	**	**	**	24.00	JOHAR TOW
15	TOWNSHIP	0	6	0	0	6	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	53.00	**	**	**	**	38.00	TOWNSHIP
16	MUGAL PURA	0	4	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42.00	**	**	**	**	38.00	MUGAL PURA
17	TAJPURA	0	4	0	0	0	0	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55.00	**	**	**	**	51.00	TAJPURA
18	PUNJAB.UNIVERSITY	0.01	12	0	0	26	0	16	0	0	0	1	0	0	1	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	79.01					26.00	PUNJAB.UNIVERSITY
	MULTAN REGION																																					
18	CHUNGI NO.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	CHUNGI NO.9
19	MUMTAZABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	MUMTAZABAD
20	SHUJAABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	SHUJAABAD
21	SAMMEJABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	SAMMEJABAD
	D.G KHAN & RAJANPUR REGION																																					
22	BELA,VIDORE	0	5	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.01	**	**	**	**	5.00	BELA,VIDORE
23	FORT MUNRO	0.01	0	0	0	0.01	0	4	0	0	0	0	0	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	13.02	**	**	**	**	6.00	FORT MUNRO
24	MARI	0.01	0.01	0	0	0	0	2	0	0	0	0	0	0	0	0.01	7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	23.03	**	**	**	**	14.00	MARI
25	VEHOVA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	VEHOVA
26	ZAIN SANGHAR	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.00	**	**	**	**	2.00	ZAIN SANGHAR
27	BAHNDU WALA RAJANPUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9.00	**	**	**	**	9.00	BAHNDU WALA RAJANPUR
28	MUNAWARA TAWI BARNALA	68	1	0	0	2	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71.01	**	**	**	**	68.00	MUNAWARA TAWI BARNALA
29	ZAIN SANGHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	ZAIN SANGHAR
	KARACHI REGION																																					
30	FAISAL BASE	23	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24.00	**	**	**	**	23.00	FAISAL BASE
31	MASROOR	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83.00	**	**	**	**	83.00	MASROOR
32	LANDHI	0.01	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.01	**	**	**	**	20.00	LANDHI
33	GULSHAN-E-HADEED	10	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.00	**	**	**	**	15.00	GULSHAN-E-HADEED
34	GULISHTAN-E-JOHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	**	**	**	**	0.00	GULISHTAN-E-JOHAR
35	NORTH KARACHI	33	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38.00	**	**	**	**	33.00	NORTH KARACHI
36	NAZIMABAD	57	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57.01	**	**	**	**	57.00	NAZIMABAD
37	SADDAR	24	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.00	**	**	**	**	24.00	SADDAR
38	UNIVERSITY ROAD	26	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31.00	**	**	**	**	26.00	UNIVERSITY ROAD
39	JHINA TERMINAL	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.00	**	**	**	**	21.00	JHINA TERMINAL

NOTE: ** Data notavilable | Historical highest rain in 24 hours upto 2016 | 0.01 Means trace Rainfall

APPENDIX-IV

ESCAPAGE BELOW KOTRI

HYDROLOGICAL YEAR FROM APRIL TO MARCH



Note: - 2016-17 (April 01 to December 19, 2016)

- Based on data supplied by I&P Deptt: Govt. of Sindh