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Irrigation and Waterways Directorate
Government of West Bengal

Annual Flood Report
2018

DIRECTOR

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ANNUAL FLOOD REPORT 2018

PREFACE

West Bengal being the lowermost riparian state of Ganga Basin and situated at the foothills of several Himalayan rivers of Brahamaputra Basin, the problem of flood management and drainage in the State of West Bengal is quite acute. Most of the rivers in the State originate from outside of the State boundary and are either of interstate or International category. The State has often witnessed destructive floods, even without any substantial rainfall within the geographical limits of its own. Along with flood and water logging, various allied problems like bank erosion, drainage congestion, and cyclonic storm has often accentuated the flood disaster. The coastal areas along the Sundarban delta, which happens to be the largest delta of the world, often experience high tidal surges resulting in severe erosion and inundation to the country sides. In a nutshell, West Bengal is having about 42.55% of its geographical area prone to flood, happens to be one of the prime flood prone states in the country.

The flood and water related disaster and associated problems in West Bengal has been almost an annual feature. Many parts of the State are victims of onslaught offload of flood waters almost every year resulting severe loss to standing crops, cattle and properties. It has been noticed that the flood fury. has increased during the last two decades.

To protect the country-side from flood ingress during peak monsoons and high tide, flood embankments are constructed along the vulnerable river banks. These embankments; constructed in various districts of the State in general and the deltaic Sundarban areas in particular, are used as prime communication links, particularly during periods of natural calamity for safe passage of people and relief materials. It virtually serves as vital lifeline to the affected areas during adverse situation. Disruption of such communication links due to failure by way of subsidence and sudden breach during flood creates havoc, bringing the life of affected areas to a grinding halt as the areas become devoid of basic amenities of life.

Factors such as intensity and duration of rainfall, sedimentation of river bed, imprudent reservoir control, tidal lockage, obstruction and encroachment in natural waterways play vital role in the occurrence of flood. Basin-wise study of flood factors and evaluation of flood hazards are indispensable for chalking out future effective plans for flood control and management measures. Accordingly, Irrigation & Waterways Directorate, at the end of every flood season ritually brings out an Annual Flood Report incorporating the history of rainfall patterns of the monsoon season, district rainfall records, major river gauge levels across the State, reservoir inflow-outflows and major flood events of the year.

This year, overall rainfall is deficient for the State as well as for the adjacent catchments. Other adverse situations have not be fallen. As a result, flood like situation did not occur save and except some minor damages at some vulnerable spots of the flood embankments.

1. INTRODUCTION

Geographically, the State of West Bengal is capped by the Himalayan snow-peaks in the North and frothy sea of Bay of Bengal on the South.The terrain is a combination of land varying from hilly regions in the north and partly high plateau in the south-west to the Gangetic alluvial plains in the rest areas. The State is beset with extensive network of rivers, their tributaries, rivulets, jhoras, irrigation canals, wetlands, ponds, beels and low-lying pockets of water bodies. With the Tropic of Cancer passing across it, the State is situated in between 21°31' & 27°13'14" North Latitudes and 85°45'20" & 89°53' East Longitudes.

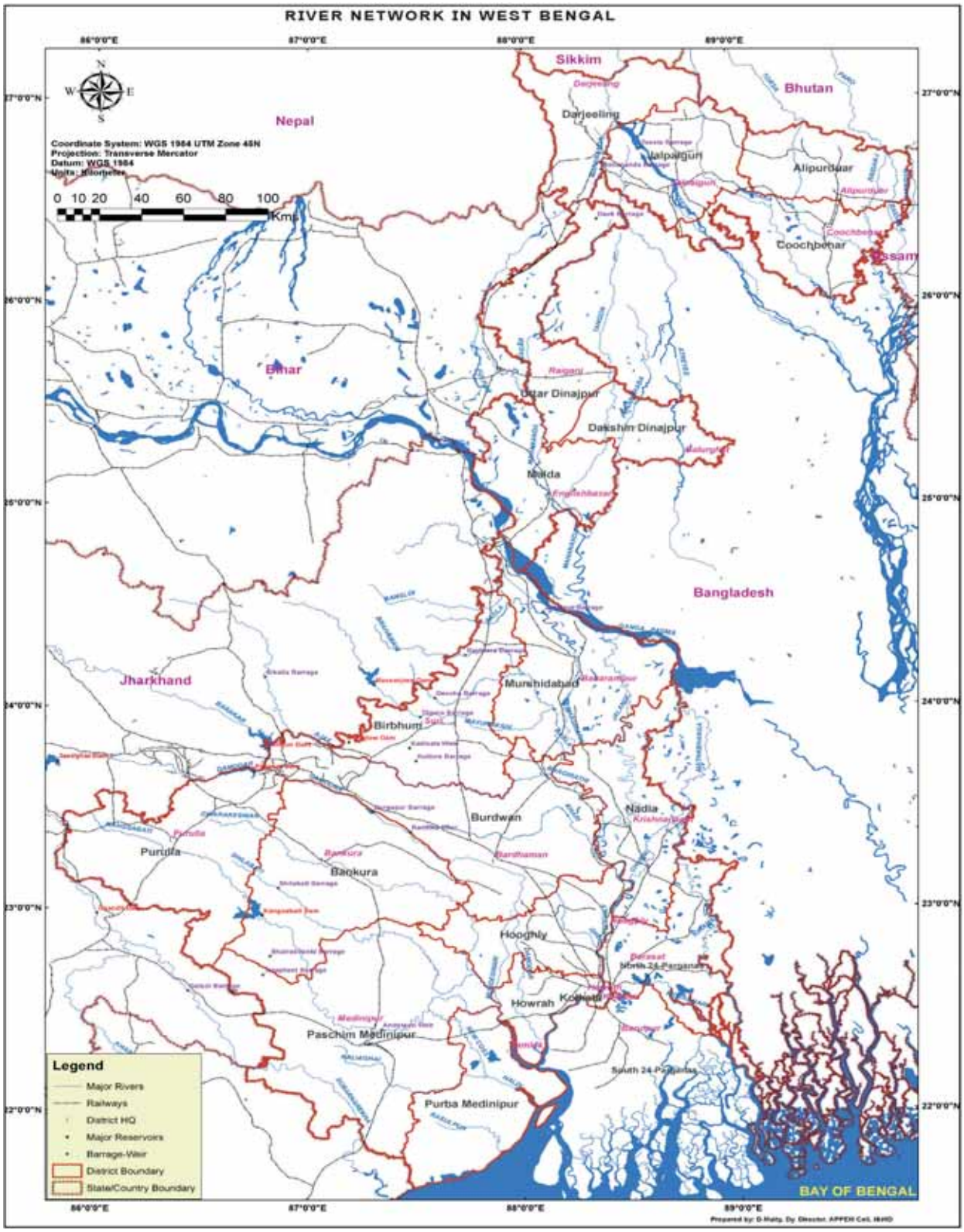
Salient features of West Bengal are given below in seriatim to give an outline of the flood situation of the State.

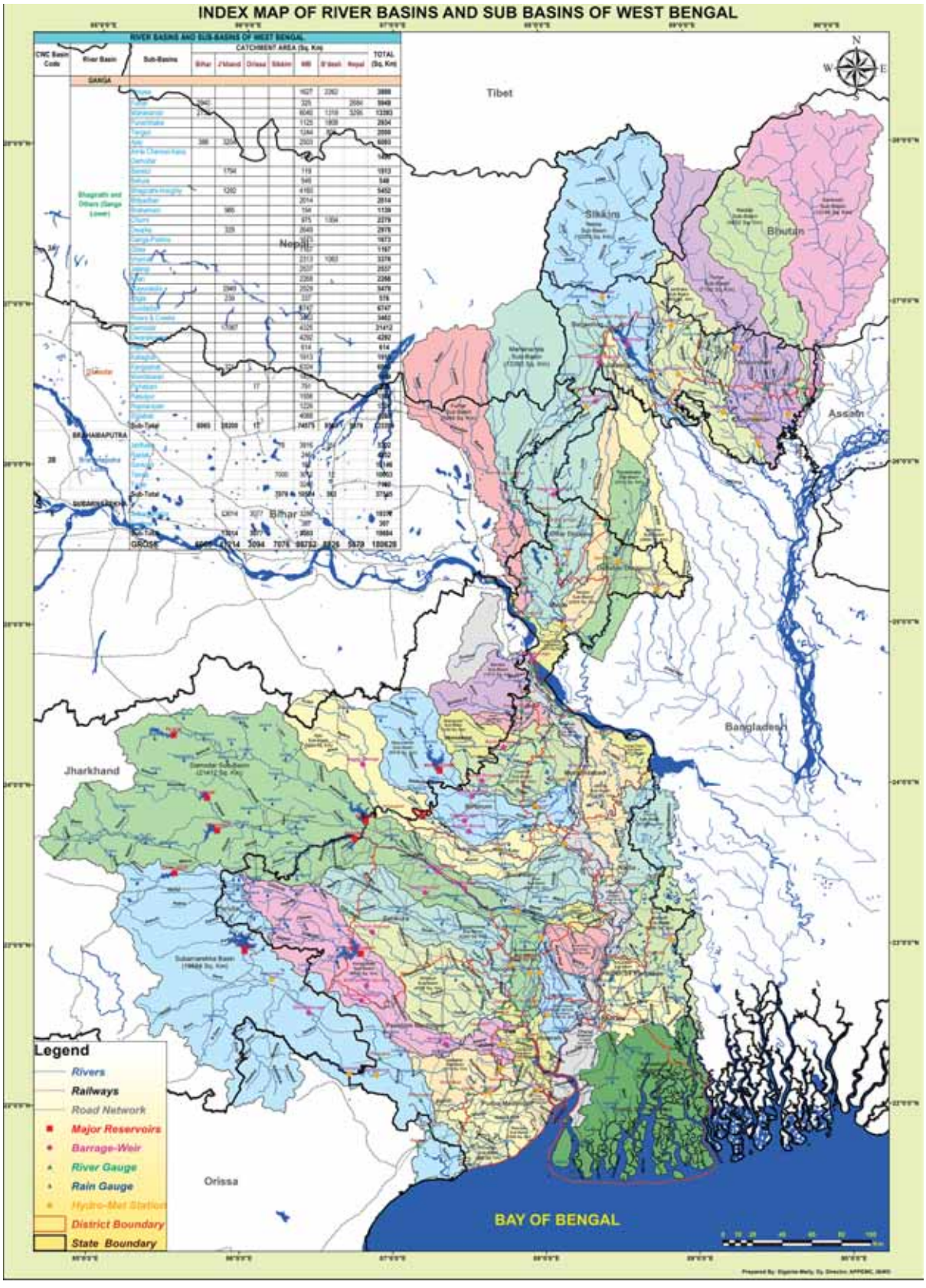
Salient Features:

Geographical area	:	88,752 sq.km
Population (2011 census)	:	9.13 crore
Districts	:	23 nos.
Total blocks	:	341 nos.
Flood susceptible districts	:	18 nos.
Vulnerable blocks	:	198 nos. (due to Flood & Tidal inundation)
River basins (with CWC code)	:	Ganga(2A), Brahamaputra(2B), and Subarnarekha (6).
Catchment area	:	1,80,628 sq. km

Annual average rainfall: 1,760 mm (Northern area: 2750 mm, Alluvial &Deltaic plain: 1650 mm, Western plateau: 1450 mm)

Total flood prone area	:	37,760 sq.km
Area already protected	:	35, 380 sq.km
Length of Embankment	:	10,584 km
Length of Drainage Channel	:	8,250 km
Length of erosion protection work		
Other than embankments	:	2,344 km
Length of sea wall	:	67 km
Total Outfall sluices	:	3,185 nos.
Pumping stations	:	21 nos.
Surface water potential	:	136.9 BCM
Ground water potential	:	14.60 BCM


RIVER NETWORK IN WEST BENGAL
Coordinate System: WGS 1984 UTM Zone 45N
Projection: Transverse Mercator
Datum: WGS 1984
Units: Kilometer
0 10 20 40 60 80 100
Kms
Sikkim
Bhutan
Nepal
Bihar
Jharkhand
Bangladesh
Darjeeling
Jalpaiguri
Alipurduar
Coochbehar
Assam
Uttar Dinajpur
Dakshin Dinajpur
Malda
Murshidabad
Birbhum
Burdwan
Nadia
Purulia
Bankura
Hooghly
Howrah
Kolkata
North 24-Parganas
South 24-Parganas
Paschim Medinipur
Purba Medinipur
BAY OF BENGAL
Legend
Major Rivers
Railways
District HQ
Major Reservoirs
Barrage-Weir
District Boundary
State/Country Boundary


INDEX MAP OF RIVER BASINS AND SUB BASINS OF WEST BENGAL
RIVER BASINS AND SUB-BASINS OF WEST BENGAL
CWC Basin Code
River Basin
Sub-Basins
CATCHMENT AREA (Sq. Km)
Bihar
Jharkhand
Orissa
Sikkim
WB
W'Basin
Nepal
TOTAL (Sq. Km)
GANGA
BRAHMAPUTRA
SUBARNAREKHA
GROSS
Tibet
Sikkim
Bhutan
Nepal
Assam
Bangladesh
Jharkhand
Bihar
Orissa
BAY OF BENGAL
Legend
Rivers
Railways
Road Network
Major Reservoirs
Barrage-Weir
River Gauge
Rain Gauge
Hydro-Met Station
District Boundary
State Boundary

2. RIVER SYSTEMS AND FLOOD PROBLEMS

West Bengal, a part of Bengal Delta, has a long-recorded history of flood. At present **42.55%** of total area of the State is susceptible to flood. Reason is the landmass of the State was formed by the Ganga-Padma system of rivers through the delta building process of which flood being the main carrier of sediments, the bulk of fluvial deposit, in huge volumes. The highest affected area as recorded in 1978 is about 30,607 sq. km and in 2000, it is about 23,971 sq. km.

Most of the rivers in the State are either Inter-State or International in character. The flood problems of the State are of different nature at different regions which are describing below.

2.1. In North Bengal:

Here rivers namely,**Teesta, Torsa, Jaldhaka, Raidak** and **Sankosh** after originating in the neighbouring countries of Bhutan and Tibet and the State of Sikkim, flow downwards through the districts of Darjeeling, Jalpaiguri, Alipurduar and Coochbehar to meet the River Bramhaputra at different locations in Bangladesh, another neighbouring country. The combined catchment of all this system of rivers up to the international border is 37,545 sq. km.

The rivers of the districts of Uttar Dinajpur and Dakshin Dinajpur namely,**Tangon, Atreyee** and **Punarbhaba** after originating at Bangladesh pass through these districts and either directly or indirectly contribute upper catchment discharges into the river **Ganga-Padma** at downstream of Farakka in Bangladesh. The combined catchment area of this river system up to the international border is 8,873 sq. km.

The southern part of district Malda through which the River **Ganga** flows receives its flood water from about 11 States and is battered by the run-off flow generated from these vast areas. Ultimately the river flows down the Farakka Barrage to Bangladesh. The western side of the Malda district receives floodwater mostly from neighbouring country of Nepal and State of Bihar through a network of rivers called **Mahananda** and **Fulahar**. Fulahar, after flowing straight south, joins with Ganga upstream of Farakka barrage while Mahananda turns towards south-east and after bifurcating Malda, outfalls into river Ganga-Padma at downstream of Farakka Barrage in Bangladesh. The combined catchment of Mahananda-Fulahar system is 19,342 sq. km.

Major contributing factors to flood in North Bengal regions are the run-off because of heavy local rainfall, discharge of upper basin areas and also outfall condition in the neighbouring countries. The Mahananda and most of the rivers of Uttar and Dakshin Dinajpur districts get stagnated when the Ganga upstream and downstream of Farakka Barrage rules high thereby not allowing drainage of flood discharge during that period.

2.2. In South Bengal:

There are certain distinctive features of drainage condition which give rise to flood situation in south Bengal. The flood in this zone becomes voluminous because of the shape of the catchment area, its steep slope starting from a high-level plateau area and sloping sharply down to a flat terrain near the outfall of limited capacity. This feature is again adversely affected by tidal conditions as is generally noticed in the month of September,

the likely month of occurrence of flood.

Basin-wise there are quite a number of river systems on the west bank of the river Bhagirathi-Hooghly like **Pagla-Bansloi**, **Dwarka-Brahmani**, **Mayurakshi-Babla** and **Ajoy**. These rivers together drain out flood water from an area of 18,177 sq. km, spread over the State of Jharkhand (the old Bihar Plateau) and the districts of Birbhum, part of Murshidabad (west of Bhagirathi) and Burdwan to outfall into river Bhagirathi. Carrying capacity of the river Bhagirathi is only 25% of the combined peak flood discharges generated from these basins because of simultaneous heavy rainfall, as it occurred during the flood of September 2000. In this vast tract of land there is one major reservoir, that is, Massanjore dam over river Mayurakshi which interferes the flood discharge of only 11% of aforesaid combined catchments.

On the left bank of the Bhagirathi river system the **Bhairab-Jalangi-Sealmari** group of rivers originate from Ganga-Padma at Akherigunj in Murshidabad district and meet the Bhagirathi at Swarupgunj in Nadia District. This system of rivers between them drains a total area of 2,537 sq. km. of Murshidabad and Nadia districts. Generally, this area suffers from flood because of three reasons – (i) high intensity rainfall in the basin area itself (ii) inflow of flood water from Ganga-Padma at its high spate and (iii) drainage congestion at its outfall because of highstage of river Bhagirathi during high tide.

In the **Damodar-Barakar** river system, the rivers originate at ChotoNagpur plateau of Jharkhand and flows down the plains of West Bengal to outfall into the **Rupnarayan-Hooghly** system through two channels namely **Mundeswari** and **Amta Channel**. The catchment area upto **Durgapur Barrage** is 18,026 sq. km.as against total catchment of 24,341 sq. km. In this catchment area there are only 4 (four) reservoirs having a storage capacity of 1.21 BCM. The original concept of flood storage was to have an area reserved for storing a volume of 3.58 BCM. Thus, with this limited flood storage capacity the storage dams at present can modify only the peak flood discharge. Any discharge above 70,000 cusecs downstream of Durgapur barrage may cause flood depending on the outfall condition of the Mundeswari at Harinkhola.

The **Shilabati-Darakeswar** and **Kangsabati-Kaliaghai** river systems which have combined catchment areas of 16,938 sq. km spread out in the districts of Purulia, Bankura, Paschimand PurbaMedinipur outfall into river **Rupnarayan** and **Haldi** respectively which finally meet river Hooghly. The **Kangsabati-Kumari dam** at Mukutmanipur, Bankura intercepts flood discharge of only 22% of the aforesaid combined catchment area. In this basin spillway discharge from Kangsabati dam above 50,000 cusecs may cause flood at lower reaches downstream of **Mohanpur Anicut** near Midnapore Town depending on tidal condition of the outfall and rainfall in the uncontrolled catchment downstream of Kangsabati dam.

The **Mathabhanga-Churni-Ichamati** system of rivers originate at the Mathabhanga off-taking from Ganga-Padma downstream of Farakka Barrage in Bangladesh and on reaching West Bengal at Majdia in Nadia district, bifurcates in two branches (i) the Churni flowing on South-Westerly direction meeting the Bhagirathi at Ranaghat and (ii) the other branch namely, the Ichamati flowing on South-Easterly direction to meet Bay of Bengal through the creek of Raimangal. The main flood situation in this area arises because of

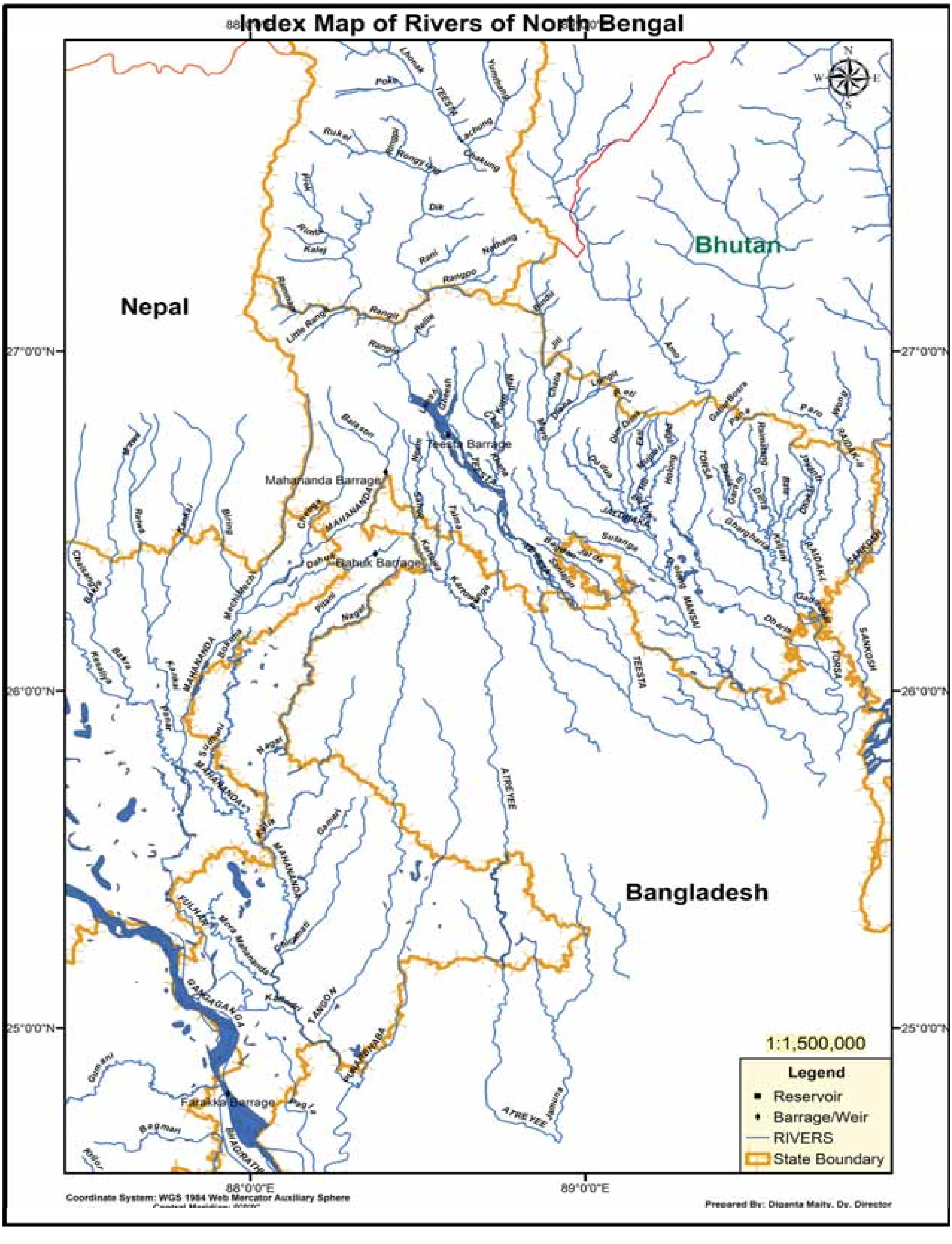
inflow from Ganga-Padma (when it rules high), rainfall in the own catchment area and also tide lockage. In 2000 flood, a very unusual situation arose where the Bhagirathi transferred a large volume of its floodwater to this basin area by breaching its embankments at several places.

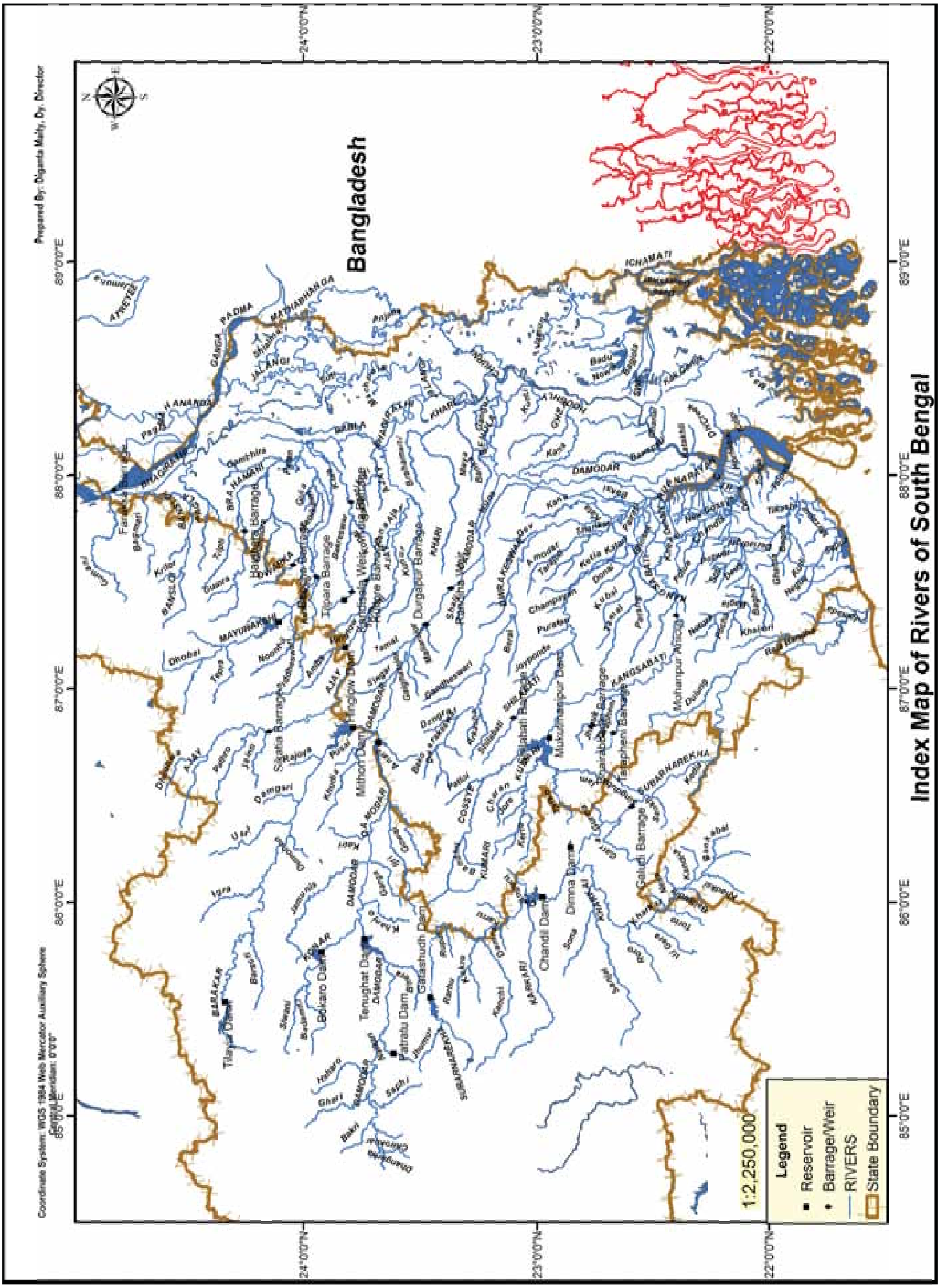
Index map of river system in North Bengal and South Bengal is presented below. The inventories of rivers, tributaries, branch channels within the sub basins have been presented in **Annexure-I**.

2.3. Historical record of flood:

Historical record of flood available in West Bengal from 1960 till present year is given below:

Flood affected Area (in Sq. Km.)	Years during which Flood occurred	Total Number of Years
Below 500	1985, 1989, 1992, 1994, 1997, 2001, 2002, 2005, 2006, 2010, 2012, 2013, 2014, 2016& 2018	15
Between 500 – 2,000	1962, 1963, 1964, 1965, 1966, 1972, 1975, 1996, 2003, 2004, 2007, 2009, 2011 & 2015	14
2,000 – 5,000	1960, 1961, 1967, 1969, 1970, 1974, 1976, 1980, 1981, 1982 & 2017	11
5,000 – 10,000	1973, 1977, 1993, 1995, 1998 & 2008	6
10,000 – 15,000	1968, 1979, 1983, 1990 & 1999	5
15,000 – 20,000	1971, 1986, 1987 & 1988	4
Above 20,000	1978, 1984, 1991 & 2000	4


Index Map of Rivers of North Bengal
Nepal
Bhutan
Bangladesh
Teesta Barrage
Mahananda Barrage
Fulbari Barrage
Farakka Barrage
27°0'0"N
26°0'0"N
25°0'0"N
88°0'0"E
89°0'0"E
1:1,500,000
Legend
Reservoir
Barrage/Weir
RIVERS
State Boundary
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Prepared By: Diganta Maity, Dy. Director


Index Map of Rivers of South Bengal
Bangladesh
Legend
Reservoir
Barrage/Weir
RIVERS
State Boundary
1:2,250,000

3. DETAILS OF RIVER BASINS AND SUB-BASINS

The State can be demarcated into three distinct drainage basins namely Ganga (CWC basin code no. 2A), Brahmaputra (CWC basin code no. 2B) and Subarnarekha (CWC basin code no. 6) basins respectively. Ganga basin has been further divided into two parts namely Bhagirathi lower & others and Damodar. These three main river basins can in turn be divided into sub-basins having individual catchment of their own. Index maps of different river sub-basins and basins are presented in **Annexure-II.**

3.1. BRAHAMAPUTRA BASIN

The rainfall in the northern region of the State is generally high. The ground slope is steep, particularly in the Sub-Himalayan regions of the northern districts. Most of these northern districts belong to Brahmaputra basin. This system consists of a total area of 10,584 sq.km. nearly 12% of the geographical area of the State. This basin area is interspersed with a large number of drainage channels which join the main drainage arteries of the regions like the rivers Teesta, Torsa, Raidak, Jaldhaka etc. All these rivers originate from the Himalayas in neighbouring countries Bhutan, Sikkim and Tibet and flow across the Terai region and reach the plains of West Bengal and then flow to Bangladesh joining ultimately the Brahmaputra in Bangladesh. The catchment area distribution of this basin and sub-basins bounded within different neighbouring States and countries has been presented in the following table.

Distribution of Catchment Area of River Basins & Sub-Basins of West Bengal

CWC Basin Code	River Basin	Sub-Basins	CATCHMENT AREA (Sq. Km.)						TOTAL (Sq. Km)
			Assam	Sikkim	West Bengal	Bangladesh	Bhutan	Tibet	
2B	**BRAHAMAPUTRA**								
	Brahmaputra Lower	Jaldhaka		76	3916	351	959		**5302**
		Raidak			246		4590	16	**4852**
		Sankosh	175		162		9734	75	**10146**
		Teesta		7000	3012	12		29	**10053**
		Torsa			3248		2363	1581	**7192**
		Sub-Total	**175**	**7076**	**10584**	**363**	**17646**	**1701**	**37545**

3.1.1. Sankosh Sub-basin

The river Sankosh with its origin in Bhutan is the eastern most river of Brahmaputra river basin. It serves as the boundary between the two states West Bengal and Assam. It joins with Raidak-II and finally falls into Brahmaputra in Bangladesh by name Gangadhar. The length of Sankosh in West Bengal is 24 km. The total

catchment area of this river sub-basin is 10,146 sq.km.

3.1.2. Raidak Sub-basin

It originates in Mt. Akungphu at an altitude of 6,400 m. in Bhutan. The river Raidak then bifurcates into two channels namely Raidak-I and Raidak-II at Bhutanghat, close to Indo-Bangladesh border. Raidak-I joins the united stream of Torsa and Kaljani, while Raidak-II is joined by Sankosh and finally outfalls into Brahmaputra in Bangladesh by the name Gangadhar. The length of Raidak-II is around 50 km in West Bengal. The total catchment area of Raidak-II river sub-basin is 4,852 sq.km.

3.1.3. Torsa Sub-basin

The river Torsa originates in Chumbi Valley of southern Tibet at an altitude of 7,065 m. It flows through Tibet, Bhutan, West Bengal and Bangladesh. Below Hasimara bridge on NH-31, it bifurcates into two channels namely Sil-Torsa and Char-Torsa. They reunite at PatlaKhowa forest. The river passes by the Coochbehar town and is joined by river Kaljani and Raidak-I. The combined flows outfalls into Brahmaputra near Nageswari at Rangpur in Bangladesh. The total length of this river is 222 km out of which 74 km is situated within West Bengal. The total catchment area of this river sub-basin is 7,192 sq.km.

3.1.4. Jaldhaka Sub-basin

The river Jaldhaka has its origin at Bitang Lake in Sikkim at an altitude of 4,400 m. It flows through Sikkim, Bhutan, West Bengal and Bangladesh. After the river is joined by a number of streams and tributaries both in mountainous and sub-mountainous regions, it finally flows into river Dharala and the combined system, by the name Dharala ultimately outfalls into Brahmaputra in Bangladesh. The total length of this river is 192 km out of which 122 km is situated within West Bengal. The total catchment area of this river Sub-basin is 5,302 sq.km.

3.1.5. Teesta Sub-basin

Teesta, the mighty river of North Bengal originates in the glaciers of North Sikkim at an altitude of 6,400 m and is formed by the union of two streams viz. Lachen and Lachung at Chungthung in Sikkim. It enters West Bengal at Rangpo and upto Mechi, it forms the boundary between West Bengal and Sikkim. Two of its tributaries, Great-Rangeet and Rammam also serve as the natural boundary between the two States. The river finally outfalls into Brahmaputra in Rangpur district of Bangladesh. The total length of this river is 309 km. out of which 103 km. is situated within Sikkim and 121 km. in West Bengal. The total catchment area of this river Sub-basin is 10,053 sq.km. Under ***'Teesta Barrage Project'*** a barrage has been constructed at Gazoldoba under Jalpaiguri district.

3.2. GANGA BASIN

The two holy rivers - Bhagirathi and Alakananda originating from the glaciers of the Himalayas at an altitude of 7,000 m join at Devprayag and the combined stream is known as the Ganga. It emerges into the plains at Rishikesh in

Uttarakhand. After flowing exclusively through Uttarakhand and Uttar Pradesh it receives the flow of Yamuna, one of its major tributaries near Allahabad. The other major tributaries of Ganga are Ton, Gomti, Gharghara, Son, Gandak, Kosi and Fulahar. The Ganga forms the boundary between Uttar Pradesh and Bihar for a length of about 110 km and the river then enters Bihar and flows more or less through the middle of the state. After its confluence with the Kosi, the Ganga continues its eastward flows in Bihar for about 40 km.

At Bhagalpur of Bihar, the river begins to flow south-southeast and as it enters West Bengal, the river swings round the Rajmahal hill range and it begins its attrition with the branching away of its first distributary, the Bhagirathi-Hooghly, which goes on to become the Hooghly River after meeting with Jalangi near Nabadwip and ultimately outfalls into the Bay of Bengal near Sagar Island. Just before the border with Bangladesh the Farakka Barrage controls the flow of the Ganges, diverting some of the water into a feeder canal linked to the Hooghly for the purpose of keeping it relatively silt-free.

The North-Central, South-Central, Western, South-Western and Southern parts of West Bengal constitute the Ganga Basin. This basin is largely divided into two major sub-basins namely Bhagirathi lower and Damodar. The total length of the river Ganga from its point of origin to the point where it falls into sea is about 2,575 km. (measured along Bhagirathi and the Hooghly) of which 1,450 km. lies in Uttarakhand and Uttar Pradesh, 110 km along Uttar Pradesh and Bihar border, 445 km. in Bihar and 570 km. in West Bengal.

The Ganga system comprises a total area of 74,575 sq. km. within the state of West Bengal. The catchment area distribution of this basin and sub-basins bounded within different neighbouring states and countries has been presented in the following table.

Distribution of Catchment Area of River Basins & Sub-Basins of West Bengal

CWC Basin Code	River Basin	Sub-Basins	CATCHMENT AREA (Sq. Km)						TOTAL (Sq. Km)
			Bihar	Jharkhand	Orissa	West Bengal	Bangladesh	Nepal	
2A	**GANGA**								
	Bhagirathi and Others (Ganga Lower)	Atreyee				1627	2262		**3889**
		Fulhar	2940			325		2684	**5949**
		Mahananda	2739			6040	1319	3295	**13393**
		Punarbhaba				1125	1809		**2934**
		Tangon				1244	806		**2050**
		Ajay	386	3204		2503			**6093**
		Amta Channel-Kana				1490			**1490**
		Bansloi		1794		119			**1913**
		Behula				549			**549**
		Bhagirathi-Hooghly		1292		4160			**5452**
		Bidyadhari				2014			**2014**
		Brahamani		985		154			**1139**
		Churni				975	1304		**2279**
		Dwarka		329		2649			**2978**

Distribution of Catchment Area of River Basins & Sub-Basins of West Bengal									
CWC Basin Code	River Basin	Sub-Basins	CATCHMENT AREA (Sq. Km)						TOTAL (Sq. Km)
			Bihar	Jharkhand	Orissa	West Bengal	Bangladesh	Nepal	
		Ganga-Padma				1673			**1673**
		Ghea				1167			**1167**
		Ichamati				2313	1063		**3376**
		Jalangi				2537			**2537**
		Khari				2268			**2268**
		Mayurakshi		2949		2529			**5478**
		Pagla		239		337			**576**
		Sundarban area				10209			**10209**
	Damodar	Damodar		17087		4325			**21412**
		Dwarakeswar				4292			**4292**
		Haldi				614			**614**
		Kaliaghai				1913			**1913**
		Kangsabati		321		6324			**6645**
		Mundeswari				1439			**1439**
		Pichabani			17	791			**808**
		Rasulpur				1556			**1556**
		Rupnarayan				1226			**1226**
		Shilabati				4088			**4088**
		Sub-Total	**6065**	**28200**	**17**	**74575**	**8563**	**5979**	**123399**

3.2.1. Mahananda-Fulhar Sub-basin

The river Mahananda originates from Ghoom near Darjeeling town in the district of Darjeeling. It is bounded on the north by the Himalayas, in the east by the ridges separating it from Teesta river system, the river Ganga on the South and the Kosi river system in the east. The river bifurcates into two channels at Barsoi in Bihar. Out of the two branches one flows through Bihar by the name Fulhar and the other flows through West Bengal as Mahananda. The river Mahananda carrying the flow of four tributaries namely, Nagar, Kalindri, Tangon and Punarbhaba, drains into the river Ganga from the North-Western side at Godogari ghat just downstream of the point where Ganga leaves the boundary of West Bengal. The combined catchment area of these two Sub-basins is 19,342 sq. km. Under ***'Teesta Barrage Project'*** a barrage has been constructed over **Mahananda** near Siliguri and another pick-up barrage has been constructed over river **Dauk** near Chopra of North Dinajpur district which is a tributary of Mahananda.

3.2.2. Atreyee Sub-basin

Some rivers like Sahu, Neem, Talma, Chaoai, Panga originating from the high lands in districts of Jalpaiguri and meet together to form Kartowa which then enters into Bangladesh by the name Atreyee. The river Atreyee then bifurcates into two channels namely Dheepa and Atreyee. The Western Channel named Atreyee re-enters into West Bengal in South Dinajpur district covering a length of 40 km in the State. It again enters into Bangladesh and ultimately outfalls into river Jamuna after

passing through Chalanbeel. The total catchment area of this river sub-basin is 3,889 sq.km at the point of leaving West Bengal boundary.

3.2.3. Punarbhaba Sub-basin

The river Dheepa after emerging out from Atreyee in Bangladesh, has taken a South -Western course to enter into South Dinajpur district assuming the name Punarbhaba. Covering a length of about 40 km. in the district it touches the eastern boundary of Malda district and finally enters into Bangladesh. Further down, Punarbhaba meets the river Mahananda in Bangladesh. The catchment area of this sub-basin is 2,934 sq.km.

3.2.4. Nagar-Kulick, Gamari-Chiramati, Tangon Sub-basins

All these rivers flow through the districts Malda and North Dinajpur and outfall into the river Mahananda. In course of their flow, somewhere they form the boundary either between West Bengal and Bihar or between West Bengal and Bangladesh. Nagar, originating in Bangladesh flows along the boundary of West Bengal and taking a South-eastern course, receives a spill channel of Mahananda and is joined by Kulick, which has also its origin in Bangladesh.

Gamari and Chiramati(or Srimati) are two small rivers that flow through North Dinajpur district before they are united. This combined streams finally outfalls into the river Mahananda. Tangon is a tributary of river Mahananda. It rises in Bangladesh. It flows through the district of North Dinajpur and Malda and meets Mahananda on the boundary of Malda and Bangladesh. The catchment area of Tangon is 2,050sq.km.

3.2.5. Bhagirathi-Hooghly Sub-basin

Farakka Barrage diverts water from river Ganga into Bhagirathi through a channel known as **Feeder canal** near Tildanga town of Murshidabad district in order to ensure minimum flow in Bhagirathi especially during dry season. This canal flowing parallel to Ganga passes Dhulian and ends just above Jangipur where Bhagirathi takes it own course. Two right bank tributaries namely Pagla and Bansloi outfall into the Feeder canal before it turns into actual Bhagirathi. It has been renamed as river Hooghly as it passes on the eastern side of Hooghly district until it outfalls into the Bay of Bengal near Sagar island.

During its entire course from origin to outfall, Bhagirathi has formed boundaries between the districts of Purba Bardhaman & Nadia, Hooghly & North 24-Parganas, Howrah & Kolkata, Purba Medinipur & South 24-Parganas. River Ajay, Mayurakshi, Damodar (Amta Channel), Rupnarayan and Haldi are the major tributaries on its right bank while river Jalangi and Churni are the major tributaries on its left bank. Some other minor tributaries on its right bank are Khari, Behula, Ghea and Rasulpur. Moreover, there are so many small drainage channels and khals which directly outfall into this river from its both banks thus forming local catchment areas of 5,452 sq.km. The Tolly's Nullah or the Adi-Ganga, as it is sometimes called is a small but important tidal creek draining into the river Hooghly from the left in the vicinity of the city of Kolkata.

One important factor which affects the drainage potential of river Hooghly is the effect of tides. The tide runs rapidly on Hooghly and produces a remarkable example of the fluvial phenomenon known as a *'tidal bore'*. This consists of the head-wave of the advancing tide, hemmed in where the estuary narrows suddenly into the river, and often exceeds 2.1 m. in height. The difference from the lowest point of low-water in the dry season to the highest point of high-water in the rainy season is reported to be more than 6 m. It has been observed that the incident of flood devastation in the districts of Purba & Paschim Medinipur, Howrah and Hooghly occur mostly when high flood discharges from Jharkhand districts along with those from Bankura, Birbhum, Paschim Bardhaman, Purba Bardhaman and Purulia districts of West Bengal synchronizes with high tides in river Hooghly specially during the month of August and September.

3.2.6. Jalangi-Bhairab Sub-basin

The river Jalangi originates from the right bank of the river Padma in Murshidabad district, 165 km. downstream of Farakka. Jalangi is dead for all purposes except during the periods of heavy rain, when it receives water from Padma. The river ends its journey by finally out falling into the river Bhagirathi near Nabadwip town of Nadia district. The major tributary of Jalangi is river Bhairab which starts its journey from the river Ganga near Lalbag of Murshidabad district. It is now almost a dead channel but during rainy season it receives water from Padma. Catchment area of Jalangi Sub-basin is 2,537 sq.km.

3.2.7. Mathabhanga-Churni Sub-basin

River Mathabhanga originates from the right bank of the Padma, at Munshiganj in Kushtia district of Bangladesh. It bifurcates near Majdia of Nadia in India, creating two channels. The western course, Churni runs a few k.m. through Nadia in a south-west direction to meet Bhagirathi and the other course Ichamati, after traversing a length of 20 km in India, enters into Bangladesh near Mubarakpur. The length of Churni is almost 56 km. Catchment area of Mathabhanga-Churni Sub-basin is 2,279 sq.km.

3.2.8. Ichamati- Bidyadhari Sub-basins

After entering into Bangladesh near Mubarakpur, river Ichamati flows for 35 km in Bangladesh and again re-enters into India at Duttaphulia of Nadia. It forms the international border between India and Bangladesh for 21 km. and finally outfalls into river Kalindi of Sundarban area. The length of Ichamati is 208 km. with the catchment area of 2,313 sq. km. within West Bengal and 1,063 sq. km. within Bangladesh. Bidyadhari originates near Haringhata in Nadia district and then flows through Deganga, Habra and Barasat areas of North 24 Parganas before joining the Raimangal River in the Sundarbans. It has been the major drainage system of North 24-Parganas and Kolkata having catchment area of 2,014 sq.km.

3.2.9. Pagla-Bansloi Sub-basins

These rivers originate from the Rajmahal hills in the Sahebganj district of Jharkhand. Flowing eastern across Birbhum district, they entered Murshidabad

district as the tributaries of the river Bhagirathi. The combined catchment area of these sub-basins is 2,489 sq. km.

3.2.10. Brahamani-Dwarka Sub-basin

Dwaraka originating in Dumka district of Jharkhand, flows through Birbhum and Murshidabad districts where it joins with Mayurakshi to form Babla which finally outfalls into the river Bhagirathi. Brahamani is the main tributary of Dwarka. It also originates in Dumka district of Jharkhand and flows through Birbhum and Murshidabad districts to meet with Dwarka. There are Baidhara and Deocha barrages across the river Brahamani and Dwarka respectively under the ***'Mayurakshi Reservoir Project***'. The total catchment area of this sub-basin is 4,117 sq. km.

3.2.11. Mayurakshi-Babla Sub-basin

River Mayurakshi(or Mor), the major river in Birbhum district, has a long history of devastating floods. It has its source on Trikut hill, about 16 km from Deoghar in Jharkhand state. Several spill channels - the Manikarnika, Kana Mor etc. take off from the Mayurakshi in its lower reaches. All these rivers including river Dwarka flow into the lower pocket of Hijalbeel in the district of Murshidabad. The combined flow when starts journey from the beel named as river Babla which finally drains into the river Bhagirathi. The drainage and flood level in the HijalBeel is considerably influenced by the ruling level of Bhagirathi.

Massanjore dam and **Tilpara barrage** have been constructed across this river as a part of' Mayurakshi Reservoir Project' which is the first major irrigation project in West Bengal after independence. Other important structures of this project situated in Birbhum are Kopai barrage on river Kopai and Kandisala weir over river Bakreswar. The combined flows of Kopai and Bakreswar are called river Kuia which outfalls into Mayurakhshi near Kandi of Murshidabad. Mayurakshi is about 250 km long out of which nearly 100 km passes through West Bengal. The total catchment area of this sub-basin is 5,478 sq.km. River Siddheswari and Noonbeel are two major tributaries of Mayurakshi outfalling into it at 8 km downstream of Massanjore dam and largely contribute the high volume of uncontrolled flood discharge during monsoon.

3.2.12. Ajay Sub-basin

River Ajay originates on a small hill about 300 m high, southwest of Munger in Bihar. It then flows through Jharkhand and enters West Bengal at Simjuri, near Chittaranjan. It forms the border between Birbhum and old Burdwan districts and finally joins the Bhagirathi River near Katwa town of Purba Bardhaman. Total length of the Ajay is 288 km. out of which 152 km. lays in West Bengal. The important tributaries of Ajay are Pathro and Jayanti in Jharkhand, Hinglow in Birbhum and Kunur in Purba Bardhaman district of West Bengal.

There is a barrage across river Ajay constructed by Govt. of Jharkhand at Sikatia. The floods of this river are flashy and of short duration. There are some pockets in the Ajay-Kunur catchment which suffer from frequent inundation. Large areas of Purba Bardhaman, Birbhum and Murshidabad districts experience inundation due

to drainage congestion whenever flood of the Ajay coincides with those of the Mayurakshi and Dwarka. A dam has been constructed over the tributary Hinglow for the purpose of irrigation in some parts of Birbhum district. The total catchment area of this Sub-basin is 6,093 sq.km.

3.2.13. Khari-Behula-Ghea Sub-basins

Khari river a minor right bank tributary of river Bhagirathi originates from the swampy field of Kanksa-Panagarh region of Purba Bardhaman district and flows mainly eastward and later south-eastward to outfall into river Bhagirathi upstream of Kalna town. Its main tributary is Banka river which acts as a spill channel of river Damodar and after flowing almost parallel to Khari it meets with Khari just before its outfall into Bhagirathi. The catchment area of this sub-basin is 2,268 sq. km.

Behula, also a spill channel of river Damodar originates near Palla village of Purba Bardhaman district and after flowing eastward it outfalls into river Bhagirathi upstream of Balagarh town of Hooghly district. Its main tributary is Gangur river. The catchment area of this sub-basin is 549 sq. km.

Ghea is another spill channel of river Damodar, originating in the Burdwan district and after flowing southward and south-eastward through Hooghly district it outfalls into Hooghly river near Champdani town. The main tributaries of this river are Kana and Kunti having a catchment area of 1,167 sq. km.

3.2.14. Damodar-Mundeswari Sub-basins

River Damodar originating from Palamau hills in Jharkhand and flowing through a length of 541 km between several districts of Jharkhand and West Bengal bifurcates into two channels at Beguahana of Purba Bardhaman district near Jamalpur. One channel carrying dominant flood discharge has been named as river Mundeswari which drains into Rupnarayan at Bakshi of Howrah district. The other channel after passing through Hooghly and Howrah districts as Amta channel carries its discharge and outfalls into the river Hooghly through an outfall sluice near Uluberia.

The river causes floods in its lower reaches in the districts of Purba Bardhaman, Hooghly and Howrah, mainly on the right bank of the river below Beguahana. Earlier known as the *'Sorrow of Bengal'* because of its ravaging floods in the plains of West Bengal, the Damodar and its tributaries have been somewhat tamed with the construction of four dams (Mithon, Panchet, Konar and Tilayia) under the control of ***'Damodar Valley Corporation*** **(DVC)'**.There is another dam at Tenughat across Damodar under the direct control of Government of Jharkhand and in the lower catchment there are one barrage at Durgapur and one weir at Randiha under the direct control of Irrigation & Waterways Department, Government of West Bengal.

River Barakar and Bokaro are two major tributaries of Damodar in Jharkhand which meet Damodar from its left bank whereas river Shali in Bankura district of West Bengal is other major tributary situated on its right bank. Harinkhola, Short-Cut channel, Kana Dwarakeswar, Hurhurakhal are other important drainage arteries of

this catchment which play important role in draining out flood discharge into river Rupnarayan, having tidal influence. The total catchment area of Damodar sub-basin in Jharkhand is 17,087 sq.km and in West Bengal is 4,325sq. km. upto Beguahana point. The local catchment area of Mundeswari sub-basin is 1,439 sq.km and that of Amta Channel-Kana Damodar sub-basin is 1,490 sq.km.

3.2.15. Dwarakeswar Sub-basin

Darakeswar river (also known as Dhalkishore) is a major river in the western part of West Bengal. It originates from Tilboni hill of Chhota Nagpur Plateau in Purulia district and enters Bankura district near Chatna. It mainly flows south-eastward and after entering into Hooghly district it turns south near Arambag town. Its main tributary Gandheswari rising from Bankura district meets Darakeswar near Bankura town. After receiving contributions from other minor tributaries like Arkasha, Berai, Shankari etc. Darakeswar finally joins with Shilabatiat Bandar near Ghatal town of Paschim Medinipur district to form river Rupnarayan. There is proposal of *"Darakeswar-Gandheswari Reservoir Project"* within this sub-basin. Catchment area of this sub-basin is 4,292 sq. km.

3.2.16. Shilabati Sub-basin

Like Darakeswar, river Shilabati (also known as Shilai) emerging from hilly terrain of Chhota Nagpur Plateau in the Purulia district, traverses south-eastward through the districts of Bankura and Paschim Medinipur to meet with Darakeswar to form Rupnarayan. River Joyponda, Ketia, Donai, Kubai and Parang are major tributaries of Shilabati. There is a small barrage constructed across the river at Kadamdeuliin Bankura district as a part of 'Kangsabati Reservoir Project'. The catchment area of this sub-basin is 4, 088 sq. km.

3.2.17. Kangsabati Sub-basin

The river Kangsabati (also variously known as the Kasai and Cossye) originating from Chhota Nagpur Plateau in the Purulia district and flowing south-eastward, joins with its main tributary Kumari river at Mukutmanipur of Bankura district where a reservoir popularly known as Mukutmanipur dam has been constructed under the ***'Kangsabati Reservoir Project'*** for the purpose of both irrigation and flood control. An Anicut structure built on this river near Midnapore town in 1872 was also added to the operations of the project. Further down, after entering into the district of Paschim Medinipur it joins with combined streams of BhairabBanki and Tarafeni rivers. Both the rivers have barrages over them under the 'Kangsabati Reservoir Project'. After travelling further east in a tortuous course it bifurcates into two rivers at Kapastikri of Paschim Medinipur.

Northern branch, known as Old Cossye after flowing through certain distance, further bifurcates into two courses at Daspur of Paschim Medinipur. One course, named as Palaspaikhal flow further east to outfall into the Rupnarayan and the main course, known as Durbachati flows south-easterly along the border of both Medinipur districts to outfall into river Rupnarayan. Old Cossye is also connected with river Shilabati through a small channel known as Kankikhal.

The southern course, known as New Cossye, flows further south-easterly direction to meet with river Kaliaghai at Dheubhanga of Purba Medinipur district and forms river Haldi which flows eastwardly into the river Hooghly at Haldia. Kherai and Bakshikhalis the main tributary of river New Cossye. The total length of Kangsabati is around 465 km.The catchment area of this sub-basin is 6,645 sq.km.Very often lower portion of this sub-basin specially Ghatal area of Paschim Medinipur and Panskura area of Purba Medinipur districts suffer from inundation due to high flood discharge from its uncontrolled catchment downstream of the Mukutmanipur dam synchronizing with high tide in river Rupnarayan.

3.2.18. Kaliaghai Sub-basin

The river Kaliaghai trickles out from Dudhkundi of Jhargram district and flows south-easterly through Paschim and Purba Medinipur to meet the other arm of Kangsabati i.e. New Cossye to form Haldi. During the course of its journey, it is fed by the flow of its tributaries namely Kapaleswari, Baghai and Chandia. The length of this river is 121 km and catchment area is 1,913 sq. km. This river is mainly responsible for flood in Sabang area of Paschim Medinipur district.

3.2.19. Rupnarayan Sub-basin

River Rupnarayan is the major drainage artery of south-western districts of South Bengal. Being the main tributary of Hooghly river, it receives tidal discharge of Bay of Bengal throughout the year and plays an important role in draining flood water from vast catchment area. Irrespective of discharges from its major tributaries like Mundeswari, Darakeswar, Shilabati and Kangsabati, it also receives flood water from many local drainage channels like Kata khal of Hooghly, Bakshikhal of Howrah, Chandreswar khal of Paschim Medinipur, Denan-Dehaty-Soadighi-Gangakhali-Pratapkhali-Shankrara khals of Purba Medinipur which directly outfall into Rupnarayan from its both banks. The length of this river is 80 km having local catchment area of1,226 sq.km.

3.2.20. Haldi Sub-basin

Two rivers New Cossye and Kaliaghai join at Dheubhanga of Purba Medinipur to form river Haldi which after traversing south-eastward outfalls into river Hooghly near Haldia town. It divides the Purba Medinpur district into two parts, the Northern part can be categorized as drainage area of Tamluk and the southern part can be categorized as Rasulpur-Nandigram drainage area. Except upper catchment discharges from Kaliaghai-New Cossye sub-basins, river Haldi drains out water from parts of both the above-mentioned drainage areas. The lower portion of the river Haldi is affected by over bank spills and drainage problem during the monsoon as entire stretch of 42 km of the river falls under the tidal influence of river Hooghly. The local catchment area of this sub-basin is 614 sq.km.

3.2.21. Rasulpur Sub-basin

The river Rasulpur is formed by union of two drainage channels namely Bagda and Sadarkhals. It is the main drainage channel in Contai sub-division of Purba Medinipur district. The river having length 19 km drains out flood water of 1,556 sq.

km. into the river Hooghly.

3.2.22. Pichabani-Negua Channel Sub-basin

River Pichabani and Negua Diversion channel systems are used to discharge rain water out from Dubda basin of Purba Medinipur district. The two channels outfall into Bay of Bengal. Catchment area of this sub-basin is 808 sq.km.

3.2.23. Sundarban Drainage Sub-basin

Apart from the rivers described earlier within the Ganga basin, there is a group of rivers in Southern part of the State which falls in the deltaic zone. These tidal rivers, estuaries and creeks are situatedon the eastern side of Hooghly river popularly known as Sundarbans which is nothing but an intricate network of number of deltaic islands of the district of South 24-Parganas. These rivers drain off whatsoever fresh discharge comes from country sides, thus ultimately draining into Bay of Bengal. Some important rivers in Sundarban are Muriganga, Mridangabhanga, Saptamukhi, Raimangal, Matla, Bidya, Thakuran, Malancha, Kalindi, Gomar etc. The total land area of Sundarban sub-basin is 6,747 sq. km. whereas including all rivers and creeks, Sundarban has gross area of 10,209 sq. km.

3.3. SUBARNAREKHA BASIN

The river Subarnarekha (also called Swarnarekha) though it has small catchment within this state, has got separate entity as it directly falls into the Bay of Bengal. Originating in the Chhotonagpur Range at an elevation of 609 m. near Ranchi, it traverses through three states *viz.* Jharkhand, West Bengal and Orissa. It drains out rain water from a total area of 19,684 sq. km. out of which only 3,593 sq. km falls within Purulia, Paschim Medinipur and Jhargram districts of West Bengal.

One major dam at Chandil and one barrage at Galudi have been constructed across Subarnarekha in Jharkhand. The important tributaries on the right bank of this river are Kanchi and Karkari which meet Subarnarekha above Chandil dam and another right bank main tributary named as Kharkai meets this river near Jamshedpur upstream of Galudi barrage. Dulung is the main tributary which joins Subarnarekha from its left in the Jhargram district of West Bengal. The total length of this river is 395 km.out of which 83 km.falls within West Bengal.

Distribution of Catchment Area of River Basins & Sub-Basins of West Bengal

CWC Basin Code	River Basin	Sub-Basins	CATCHMENT AREA (Sq. Km.)			TOTAL (Sq. Km)
			Jharkhand	Orissa	West Bengal	
6	SUBARNAREKHA	Subarnarekha	13014	3077	3286	**19377**
		Kashpal			307	**307**
		Sub-Total	13014	3077	3593	**19684**

4. HYDRO-METEOROLOGICAL DATA COLLECTION & DISSEMINATION

Irrigation and Waterways Department (IWD), Govt. of West Bengal is responsible for maintenance, collection, compilation and dissemination of hydrological and meteorological data for the purpose of monitoring of flood or flood-like situation for almost all river sub-basins of the State during monsoon. For this purpose, network of river gauges and rain gauges have been established at the important locations and during monsoon flood control rooms in each district are set up including the Central Flood Control Room (CFCR) at Jalasampad Bhavan, Salt Lake, Kolkata.

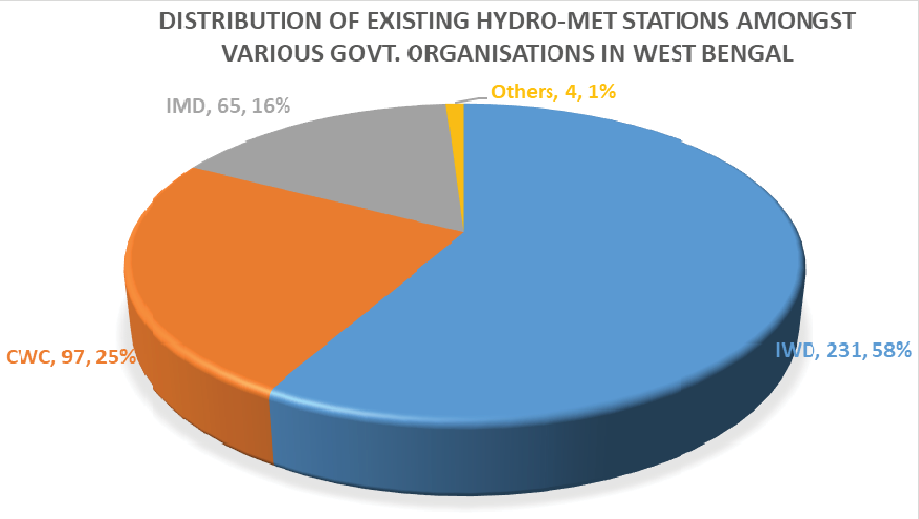
4.1. Rain and River Gauges

Apart from IWD, other organizations like Central Water Commission (CWC), India Meteorological Department (IMD), State Agricultural Department (AGRI), Kolkata Port Trust (KoPT), Damodar Valley Corporation (DVC) and Surface Water Investigation Directorate (SWID) under Water Resources Investigation & Development Department (WRIDD) have set up network of river gauges and rain gauges of their own at different locations for monitoring hydrological and meteorological data. These field data mainly include daily rainfall, water level of river and reservoir, river discharge and inflow-outflow from reservoir. In addition to that other information like inflow forecast, meteorological forecast and flood damage are also collected.

Existing Hydro-Met Monitoring Stations in the State

Type	IWD	CWC	IMD	Others
Rain Gauge Stations (ORG/ARG/AWS/FCS)	127	33	65	3
River Gauge Stations (G/G-D/Sediments/HOS)	104	64	-	1
Total	231	97	65	4

ORG = Ordinery Rain Gauges	ARG = Automatic Rain Gauges
AWS= Automatic Weather Station	FCS = Full Climatic Station
HOS = Hydrological Observation Station (Gauge,Discharge, Silt/Sediment, Water Quality)	HMS = Hydro-Meteorological Station (Rainfall, Temperature, Wind speed, Solar radiation, Humidity, & other Weather parameters)



Besides Ordinary Rain & River gauges, IWD also mentains 6 nos Gauge-Discharge stations at six different rivers and 13 nos. Hydrological Observation Stations(HOS) at Dam & Barrage sites for measurement of Reservoir levels, Inflow, Outflow, Canal discharges & sediment/silt content if requires.

A comprehensive list of existing Hydro-Met stations within the State under the jurisdiction of Irrigation & Waterways Department, Central Water Commission and India Meteorological Department and the data recorded by Irrigation & Waterways Department, is given in the **Annexure - III.**

Recently under National Hydrology Project (NHP), IWD is going to commission a '*Real Time Data Acquisition System (RTDAS)*' for efficient flood forecasting and modelling within the State. For this, fully automated radar and sensor type new hydro-met stations will be installed. Automated rain gauges (ARG), automated water level recorder (AWLR) as river gauges, automated weather stations (AWS),velocity radars, and authomatic reservoir monitoring stations are being proposed under the RTDAS.

4.2. Role of Central Flood Control Room

The present flood monitoring and management system in the State comprises with the preparation of Daily Flood Report by Central Flood Control Room (CFCR) of IWD and transmission of the same to the State Disaster Management Department with the Head Quarter at Kolkata. This report is also shared with the Chief Secretary, Home Secretary of the State and other organisation like Railway Authorities, Bengal Army Headquarters, CWC Monitoring Office, Kolkata Port Trust (KoPT), Municipal Corporation of Kolkata (KMC), all District Magistratesof the State.

This Daily Flood Report generally contains rainfall, river and gauge and discharge, river warning levels/signals, weather information, reservoir level/inflow/outflow data of different Stations within and outside the State. Sometimes the location and extent of major damages, the status of affected areas under inundation etc. are also included, as and when the situation such warrants. These data are collected from different district flood control rooms under IWD (details given in **Annexure-XII**) along with other agencies like IMD, CWC and DVC by telephone, fax, e-mail or Whatsapp messages. Daily flood report is also uploaded in the departmental web site **www.wbiwd.gov.in**.

During emergency, separate Flood Bulletin is issued and the same will be disseminated also to the District Disaster Management Cells and other authorities via e-mail, Fax, SMS or Whatsapp messages.

This year, CFCR is operational 24x7 during entire monsoon & flood season starting from 1st June, 2018 to 31st October 2018, collected raw data from all existing hydro-met stations & reservoir data of IWD's district control rooms, rainfall and weather forecast/warning from IMD websites, relevant data from CWC, DVC, Chandil Dam, Galudih & Sikatia barrage authorities, compiled all these in the standard proforma and finally prepared the Daily Flood Report for dissemination by 10.00 a.m.

5.RAINFALL

Climatological variations are observed in West Bengal due to its physical and geographical position. The annual average rainfall in the State is 1750 mm, of which more than 75% occurs during the monsoon period while the hilly regions at the foothills of Himalaya receive the heaviest rainfall ranging from 2500 mm to 4000 mm. The southern districts in the plains receive average of 1125 mm to 1875 mm. Main rainfall season in this state is the South-West monsoon season during which the entire land (excepting the extreme north, the extreme north-east and extreme south) gets 75% of the annual rainfall. The gangetic plains of West Bengal get 78% of its annual rainfall during the monsoon period distributed normally from 1st day of June to the end of September. But during last few years, some parts of West Bengal have experienced premature heavy rainfall in the last week of May causing flood.However, the late withdrawal of monsoon even after second week of October has also been observed during these years.

5.1. Normal Rainfall Pattern

The river Ganga divides the State into two parts, which are by and large homogeneous from the meteorological point of view. The northern half is designated as 'Sub-Himalayan West Bengal' and the southern half as 'Gangetic West Bengal'. Sub-Himalayan West Bengal is more susceptible to heavy rains both in respect of amount as well as in frequency of occurrence.

Very heavy rain is more frequent in first two months (June and July) than in subsequent, in the Sub-Himalayan West Bengal. In Gangetic West Bengal, the frequency is maximum in August followed by June, July and September in that order. On the basis of rainfall distribution, the State can be divided into two broad zones -(i) The Himalayan and Sub-Himalayan Region (ii) The Gangetic Plains

i) Himalayan and Sub-Himalayan Region

The Himalayan and Sub-Himalayan Region comprises the districts of Darjeeling, Jalpaiguri, Coochbehar and Northern part of Islampur Sub-Division of Uttar Dinajpur district of high intensity of rainfall from 2000 mm to over 4000 mm, about 80% of which is found to occur during monsoon season. On an average, Darjeeling, Coochbehar and Jalpaiguri get 114,112,110 rainy days respectively in a year.

The monsoon generally follows a northern track to ultimately break up against Eastern Himalaya causing very heavy rainfall and thereafter, trough of low pressure under break monsoon conditions. It then shifts northward to the Himalayan foothills. It has been found that a precipitation between 200 to 300 mm in two hours is not unusual here.

ii) Gangetic Plains

The gangetic plains which constitute the major portion of the State, can be further sub-divided into the following three sectors on the basis of average rainfall.

Sector - I: Bankura, Burdwan, Hooghly, Nadia and Purulia districts which receive an average rainfall - between 1140 mm and 1400 mm.

Sector - II: Birbhum, Midnapore, Murshidabad and North 24-Parganas having an average annual rainfall between 1400 mm and 1650 mm.

Sector-III: Kolkata, Howrah and South 24-Parganas having an averageannual rainfall - between 1650 mm and 1900 mm.

Such regional variations in the precipitation pattern causes flood conditions from time to time.

5.2. Intensity & Spatial Distribution of Rainfall

The India Meteorological Department (IMD) categorises the intensity and distribution of

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daily rainfall in the following manner:

Intensity of Rainfall

Descriptive term used	Rainfall amount (in mm)	Descriptive term used	Rainfall amount (in mm)
"No Rain"	0	Rather Heavy Rain	35.6 - 64.4
Very Light Rain	0.1 - 2.4	Heavy Rain	64.5 - 124.4
Light Rain	2.5 - 7.5	Very Heavy Rain	124.5 - 244.4
Moderate Rain	7.6 - 35.5	Extremely Heavy Rain	> 244.5
Exceptionally Heavy Rain	When the amount is a value near about the highest recorded rainfall at or near the station for the month or season. However, this term will be used only when the actual rainfall amount exceeds 120 mm.		

Spatial Distribution of Rainfall

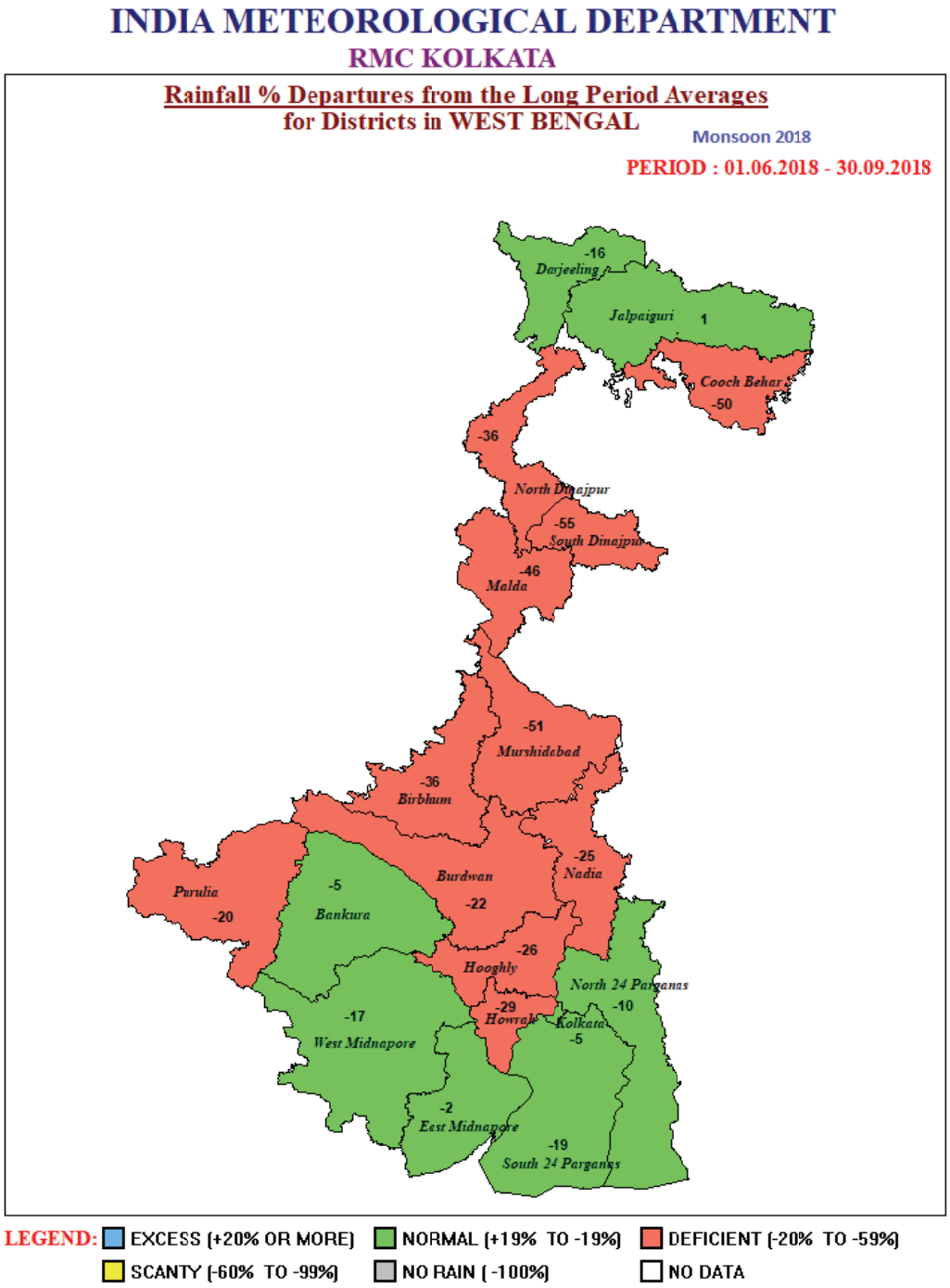
Distribution	No. of Places	Description
Isolated	One or two places	<25% of stations get rainfall
Scattered	At a few Places	(26–50) % of stations get rainfall
Fairly Widespread	At many places	(51–75) % of stations get rainfall
Wide spread	At most places	(76–100) % of stations get rainfall
Dry	–	No station reported rainfall

Weekly/Seasonal Rainfall Distribution on Regional Scale

Excess	Percentage departure of realised rainfall from normal rainfall is + 20% or more.
Normal	Percentage departure of realised rainfall from normal rainfall is between - 19 % to + 19 %.
Deficient	Percentage departure of realised rainfall from normal rainfall is between - 20 % to - 59 %.
Scanty	Percentage departure of realised rainfall from normal rainfall is between - 60 % to - 99 %.
No rain	Percentage departure of realised rainfall from normal rainfall is between - 100 %.
Rainfall Distribution on All India Scale	
Normal	Percentage departure of realised rainfall from normal rainfall is within ± 10 % of the Long Period Average.
Below Normal	Percentage departure of realised rainfall from normal rainfall is < 10 % of the Long Period Average.
Above Normal	Percentage departure of realised rainfall from normal rainfall is > 10 % of the Long Period Average.
All India Drought Year	When the rainfall deficiency is more than 10%, and when 20 to 40% of the country is under drought conditions, then the year is termed as All India Drought Year
All India Severe Drought Year	When the rainfall deficiency is more than 10% and when the spatial coverage of drought is more than 40%, it is called as All India Severe Drought Year.

5.3. Monsoon 2018

For the State as a whole, the total monsoon rainfall as per IMD, from 1stJune to 30thSeptember during the Year 2018 was deficient with the deviation of -24.2% from its average normal. IMD has prepared a percentage rainfall departure map from long period average for districts in West Bengal which is presented below:



In North Bengal(Himalayan and Sub-Himalayan region), the total monsoon rainfall deviation was-29.6% from its normal average while that of South Bengal (Gangetic Plains) is -20.0% as shown in the following table.

Monsoon Rainfall [01.06.18-30.09.18] (mm)			
Zone	Actual	Normal	% Dep
North Bengal	8194.8	11633.5	-29.6%
South Bengal	11991.3	14986.9	-20.0%

The Sectoral variations of monthly rainfall in West Bengal during monsoon months 2018 is given below.

Variation of Monthly Rainfall of Sub-Himalayan West Bengal during Monsoon 2018

Month	June			July			August			September		
Rainfall in mm	Actual	Normal	% Dep	Actual	Normal	% Dep	Actual	Normal	% Dep	Actual	Normal	% Dep
North Bengal Sector	1690.8	2692.7	-37.2%	2357.5	3622.0	-34.9%	2033.0	2890.3	-29.7%	2113.5	2428.5	-13.0%

Variation of Monthly Rainfall of Gangetic Plains of West Bengal during Monsoon 2018

Month	June			July			August			September		
Rainfall in mm	Actual	Normal	% Dep	Actual	Normal	% Dep	Actual	Normal	% Dep	Actual	Normal	% Dep
Sector-I South Bengal	829.9	1112.8	-25.4%	1522.5	1482.9	2.7%	1107.4	1384.1	-20.0%	726.3	1217.5	-40.3%
Sector-II South Bengal	901.4	1229.1	-26.7%	1410.7	1574.1	-10.4%	1104.3	1514.7	-27.1%	1046.2	1426.6	-26.7%
Sector-III South Bengal	950.4	827.5	14.9%	1041.8	1167.8	-10.8%	744	1080.8	-31.2%	606.4	969	-37.4%

*Dep = Departure *Source: IMD

From the above two tables, deficient rainfall is observed in West Bengal in 2018.

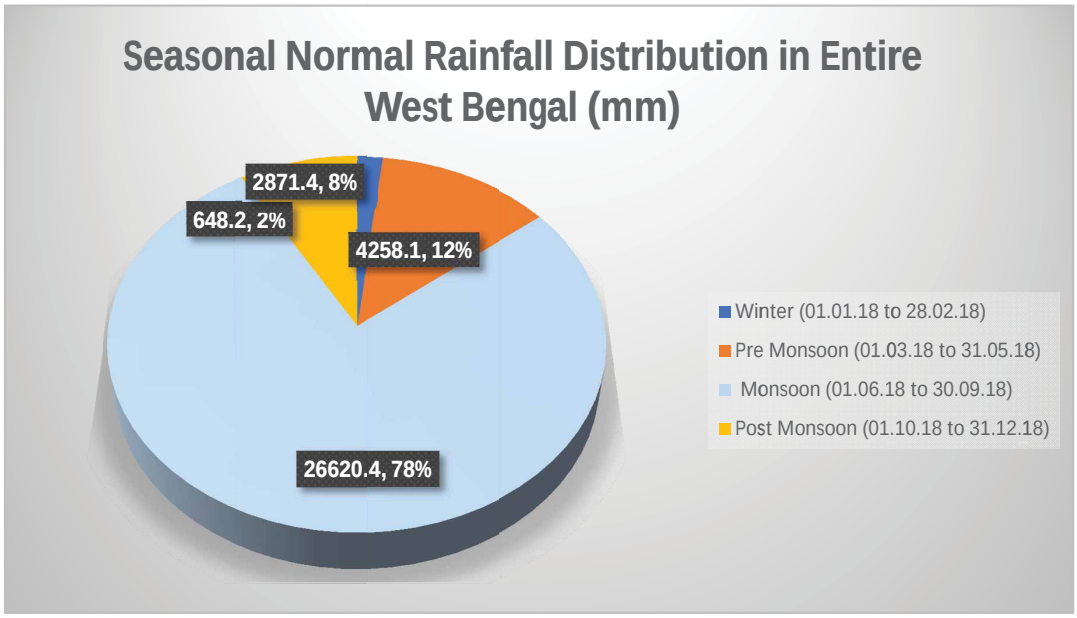
5.4. Rainfall in Non-Monsoon Period 2018

As defined by IMD, meteorological seasons comprising of four seasons.

A) Winter (1st January to 28th February)
B) The Pre-monsoon (1st March to 31st May),
C) Monsoon (1st June to 30th September) and
D) Post-monsoon (1st October to 31st December)

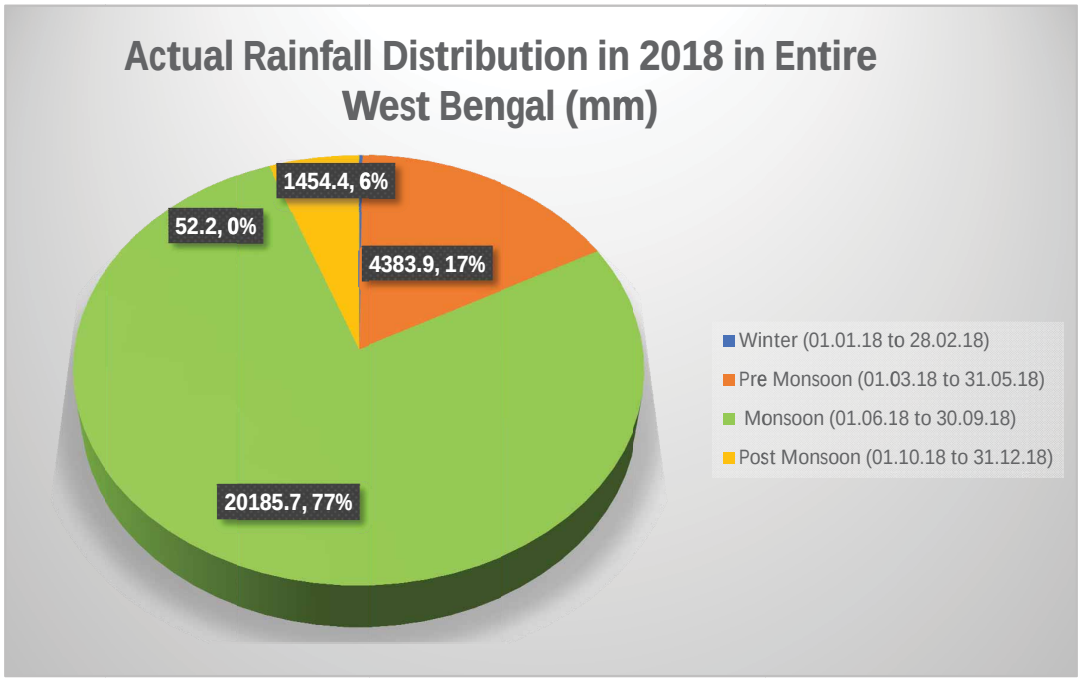
The **Normal** rainfall of above seasons in West Bengal is presented below:

Seasonal Normal Rainfall Distribution in Entire West Bengal (mm)			
Winter (01.01.18 to 28.02.18)	Pre-Monsoon (01.03.18 to 31.05.18)	Monsoon (01.06.18 to 30.09.18)	Post Monsoon (01.10.18 to 31.12.18)
648.2	4258.1	26620.4	2871.4

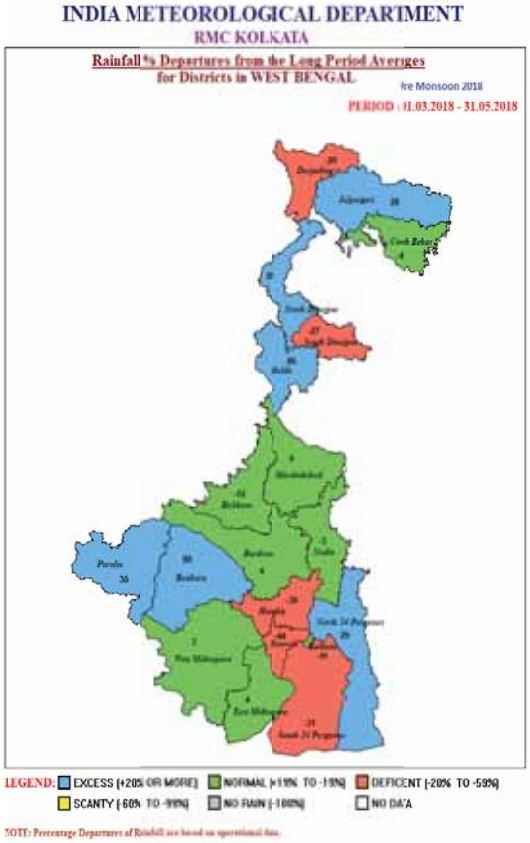


The **Actual** rainfall in all the above seasons in West Bengal are presented below:

Actual Rainfall Distribution in 2018 in Entire West Bengal (mm)			
Winter (01.01.18 to 28.02.18)	**Pre-Monsoon (01.03.18 to 31.05.18)**	**Monsoon (01.06.18 to 30.09.18)**	**Post Monsoon (01.10.18 to 31.12.18)**
52.2	4383.9	20185.7	1454.4



IMD has prepared percentage rainfall departure maps from long period average for districts in West Bengal for pre-monsoon and post monsoon period which are presented below:



- District wise monthly rainfall along with its deviations in West Bengal as received from IMD has been tabulated in **Annexure -IV**.
- The graphical representation of monthly rainfall 2018 vis-à-vis normal rainfall of each districts are presented in **Annexure - V.**
- The cumulative monthly rainfall of various Rain gauge stations under different River Sub-Basins is given in **Annexure - VI.**

This year, IWD's Central Flood Control Room was in operation for the entire flood season i.e. from 1st June to 31st October.

6. FLOOD SEASON 2018

As per Govt. of India's Water Resources Information System (India-WRIS) and Central Water Commission (CWC), monsoon period comprises of five months from June to October. Consequently, flood season also comprises from June to October. The distribution of total monthly rainfall in the State for this seasonshows average deficit of rainfall of 30.6% with a minimum of 19.3% in July 2018 to maximum of as high as 55.1% in October 2018.

Distribution of Monthly Rainfall in West Bengal during Flood Season 2018

Month	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure
Jun-18	4372.5	5862.1	-25.4%
Jul-18	6332.5	7846.8	-19.3%
Aug-18	4988.7	6869.9	-27.4%
Sep-18	4492.4	6041.6	-25.6%
Oct-18	1060.2	2363.1	-55.1%

*Raw Data: IMD

6.1. Flood Spells in North Bengal

6.1.1. In July:

Due to an excessive rainfall in the 1st week of July, few river systems, under Brahamaputra basin in Alipurduar and Coochbehar districts and few rivers of Dinajpur of North Bengal experienced one flood spell during the period from 4thto 5thJuly.

The peak flood levels in different river gauge stations have been presented in the table below.

Sl	River	River Gauge Station	District	Maximum Water Level (m)	Date of occurrence of Peak Flood	Remarks
1	**Raidak-I**	L.R.P. Crossing	Alipurduar	**46.65**	04-07-2018	0.55 m. above PDL/WL
2	**Kaljani**	Alipurduar		**45.35**	04-07-2018	0.25 m. above DL
3	**Raidak-I**	Tufanganj	Coochbehar	**35.80**	05-07-2018	0.50 m. above DL
4	**Torsa**	Coochbehar		**41.66**	05-07-2018	0.20 m. above PDL/WL
5	**Mansai**	Mathabhanga		**47.55**	05-07-2018	0.35 m. above PDL/WL
6	**Teesta**	Mekhliganj		**65.93**	05-07-2018	0.58 m. above PDL/WL
7	**Mahananda**	Sonapur	North Dinajpur	**75.18**	05-07-2018	0.01 m. above PDL/WL
8	**Punarbhaba**	Gangarampur	South Dinajpur	**25.23**	08-07-2018	0.01 m. above PDL/WL

The first 5days' daily rainfall during 1stto 5thJuly, 2018 at some of the important rain gauge stations in North Bengal under Brahamaputra basin is shown in the following table.

Sl.	River Basin	District	Normal Annual Rainfall (mm)	Location of Rain Gauge Station	Total Amount of 5-days (mm)	% of Normal Rainfall	One Day Max. Rainfall	
							(mm)	On
1	**Teesta**	Jalpaiguri	3463.30	**Malbazar**	348.40	10.06%	145.40	4.7.18
2	**Teesta**	Jalpaiguri	3463.30	**Jalpaiguri**	504.50	14.57%	214.60	1.7.18
3	**Jaldhaka**	Jalpaiguri	3463.30	**Banarhat**	695.00	20.07%	**360.00**	4.7.18

Sl.	River Basin	District	Normal Annual Rainfall (mm)	Location of Rain Gauge Station	Total Amount of 5-days (mm)	% of Normal Rainfall	One Day Max. Rainfall	
							(mm)	On
4	**Jaldhaka**	Jalpaiguri	3463.30	**Maiguri**	419.27	12.11%	162.00	1.7.18
5	**Jaldhaka**	Coochbehar	3443.70	**Mathabhanga**	264.80	7.69%	139.20	1.7.18
6	**Sankosh**	Alipurduar	3463.30	**Barabisha**	411.80	11.89%	166.80	1.7.18
7	**Torsa**	Jalpaiguri	3463.30	**Hasimara**	766.80	22.14%	298.40	4.7.18
8	**Torsa**	Alipurduar	3463.30	**Alipurduar**	510.20	14.73%	276.40	4.7.18
9	**Torsa**	Coochbehar	3443.70	**Coochbehar**	337.40	9.80%	193.80	1.7.18
10	**Torsa**	Coochbehar	3443.70	**Tufanganj**	445.00	12.92%	320.00	1.7.18
11	**Mahananda-Fulhar**	Darjeeling	3118.50	**Siliguri**	430.80	13.81%	177.40	4.7.18

6.1.2. In September:

Sl	River	River Gauge Station	District	Maximum Water Level (m)	Date of occurrence of Peak Flood	Remarks	
1	**Torsa**	Hasimara	Alipurduar	116.20	10-09-2018	1.10	m. above PDL/WL
2	**Mahananda**	Hill Curt Road	Darjeeling	116.20	10-09-2018	0.23	m. above DL
3	**Jaldhaka**	NH-31 Crossing	Jalpaiguri	80.25	10-09-2018	0.15	m. above DL
4	**Sankosh**	L.R.P. Crossing	Alipurduar	47.65	14-09-2018	0.05	m. above PDL/WL
5	**Teesta**	Domohani	Jalpaiguri	85.83	14-09-2018	0.23	m. above PDL/WL
6	**Fulhar**	Teljana	Malda	27.60	16-09-2018	0.17	m. above DL
7	**Ganga-Padma**	Manikchakghat	Malda	25.02	17-09-2018	0.33	m. above DL
8	**Diana**	Chengmari	Jalpaiguri	200.60	26-09-2018	0.10	m. above DL

The 7-days' continuous rainfall occurring during 9thto 15thSeptember, 2018 at some of the important rain gauge stations in North Bengal under Brahamaputra basin have been given in the following table.

Sl	River Basin	District	Normal Annual Rainfall (mm)	Rain Gauge Station	Total Amount (mm)	% of Normal Rainfall	One Day Max. Rainfall (mm)	On
1	**Teesta**	Jalpaiguri	3468.30	**Malbazar**	667.30	19.2%	301.80	10.9.18
2			3468.30	**Jalpaiguri**	535.3	15.4%	135.00	10.9.18
3	**Jaldhaka**		3468.30	**Banarhat**	646.0	18.6%	300.00	10.9.18
4			3468.30	**Maiguri**	613.0	17.7%	132.00	10.9.18
5	**Sankosh**	Alipurduar	3468.30	**Barabisha**	617.2	17.8%	133.40	09.9.18
6	**Torsa**		3468.30	**Hasimara**	645.0	18.6%	340.40	10.9.18
7			3468.30	**Alipurduar**	592.2	17.1%	130.20	10.9.18
8	**Mahananda-Fulhar**	Darjeeling	3118.50	**Siliguri**	510.0	16.4%	257.00	10.9.18

A small spell of 2 to 3 days heavy to very heavy rainfall in Jalpaiguri district from 24.9.2018 caused Daina river to flow over the danger level.

Flood frequency curves of different rivers in North Bengal have been presented in **Annexure-VII**.

6.2. Flood Spells in South Bengal

6.2.1. In August:

Sl	River	River Gauge Station	District	Maximum Water Level (m)	Date of occurrence of Peak Flood	Remarks
1	**New Cossye**	Panskura	Purba Medinipur	9.91	08-08-2018	0.01 m. above EDL
2	**Old Cossye**	Kalmijole	Paschim Medinipur	9.90	08-08-2018	At EDL
3	**Kangsabati**	Mohanpur		25.52	07-08-2018	0.38 m. above PDL/WL
4		Kapastikri		15.75	07-08-2018	0.35 m. above PDL/WL

The 3-days' peak rainfall scenario during 6thto 8thAugust, 2018 at some rain gauge stations in South Bengal under Kangsabati basin is portrayed in following table.

Sl	River Basin	District	Normal Annual Rainfall (mm)	Rain Gauge Station	Total Amount (mm)	% of Normal Rainfall	One Day Maximum Rainfall	
							(mm)	On
1	Kangsabati	Purulia	1363.30	**Kharidwar**	142.00	10.4%	104.60	7.8.18
2	Kangsabati	Jhargram	1535.50	**Jhargram**	351.90	22.9%	**276.25**	6.8.18

6.2.2. In September:

Sl	River	River Gauge Station	District	Maximum Water Level (m)	Date of occurrence of Peak Flood	Remarks
1	**Kapaleswari**	Narayanbarh	Paschim Medinipur	5.43	23-09-2018	0.10 m. above DL
2	**Kaliaghai**	Bakhrabad		8.25	22-09-2018	0.45 m. above PDL/WL
3		Amgachia		5.70	23-09-2018	0.52 m. above PDL/WL

The 3-days' peak rainfall scenario during 20th to 22nd September, 2018 at relevant rain gauge stations in South Bengal under Kangsabati basin is shown in following table.

Sl	River Basin	District	Normal Annual Rainfall (mm)	Rain Gauge Station	Total Amount (mm)	% of Normal Rainfall	One Day Max. Rainfall (mm)	On
1	Kaliaghai	Paschim Medinipur	1535.50	Sabang	295.00	19.2%	135.00	21.9.18
2	Rasulpur	Purba Medinipur	1669.60	Contai	401.00	24.0%	193.80	21.9.18
3	Subarnarekha		1669.60	Digha	302.00	18.1%	142.00	20.9.18

Flood frequency curves of different riversin South Bengal have been presented in **Annexure-VII**.

6.2.3 In October:

Cyclonic strom '*Titli*' formed in Bay of Bengal, tore into coastal areas of Andhra Pradesh and Orissa on 11th October, 2018. Due to its effect, heavy to very heavy rainfall occurred in Purba & Paschim Medinipur and Jhargram district during 11th-13th October. But as the water level of adjacent rivers of Kangsabati, Kaliaghai, Chandia, Haldi, Rasulpur and Subarnarekha were considerably low from well beforehand, no adverse

6.3. Reservoir and Barrage Data

The instantaneous Inflow-Outflow and Reservoir level data during this flood season for dams and barrages under the control of Irrigation & Waterways Department have been compiled in **Annexure-VIII**.

The inflow-outflow data along with reservoir levels of different Dams and Barrages in West Bengal during 1st June to 31st October, 2018 have been presented in figuresin **Annexure-IX**.

6.4. Warning / Signal System

North Bengal Central Flood Control Room, Jalpaiguri imposes warning / signal system for protected and unprotected river banks of North Bengal during peak flood period. The details of signal imposed and later withdrawn; on receding of river levels in given in the following table.

Flood Warning Levels of North Bengal Rivers

Gauge obtained from	Signal Imposed By	Name of River	Name of Gauge Station	Unprotected Area		Protected Area	
				Yellow	Red	Yellow	Red
Irrigation & Waterways Department, Government of West Bengal	JPG	Teesta	Teesta Bazar	211.00	213.00		
			Coronation Bridge	149.40	151.80	150.00	153.60
			Domohoni	85.65	85.95	85.95	86.30
	CBR		Mekhliganj	65.45	65.95		
	JPG	Jaldhaka	N.H-31 C (Nagrakata)	160.70	161.30	161.00	161.80
			N.H-31 Crossing	80.00	80.50	80.10	80.90
	CBR	Mansai	Mathabhanga	47.70	48.70	48.40	48.90
	APD	Torsa	N.H-31 C (Hasimara)	116.30	116.90	116.30	117.50
	CBR		C.B.R (Kashab Ashram)	42.07	42.68		
	APD	Kaljani	P.W.D (Alipurduar)	45.10	45.70		
		Raidak-I	N.H-31C(Chapan)	46.70	47.60	47.00	47.90
		Raidak-Ii	N.H-31C (Telepara)	48.10	49.00	48.40	49.30
		Daina	Chengmari	200.50	201.40		
		Sankosh	N.H-31C (LRP)	48.20	49.10	48.50	49.40
	CBR	Mujnai	BhutnirGhat	61.70	62.30		
		Raidak-I	Tufanganj	34.22	35.30		
	SLG	Mahananda	Siliguri	115.97	116.59		

Abbreviations:- JGP: Jalpaiguri, CBR: Coochbehar, APD: Alipurduar,SLG: Siliguri

The warning signals imposed for different rivers in North Bengal for this flood season is tabulated in **Annexure –X.**

6.5. Flood Damage Data

Extent and expenditure involved for restoration of flood damages occurred in different districts of North Bengal and South Bengal have been presented in **Annexure-XI.**

7. Conclusion

West Bengal is mainly recepient of run-off generated from outside of the State. It has typical basin characteristics. In the north, the rainfall is high and the ground slope is steep in the Sub-Himalayan region. The rivers in the Terai region are wide and shallow. Due to continuous denudation of forest cover and dolomite mining in the hills, the silt loads are continuously deposited in the river beds, reducing the carrying capacity of rivers, causing it to overflow during high discharges, often creating flood situations. In the central and southern region, heavy rainfall and surface run-off decending from the upper catchments, often outside the State geographical boundary, causes flood inundation and drainage congestion due to flat topography of the region.

Main structural measures of flood control in West Bengal are river embankments measuring about 10,500 km., spread over different river systems, constructed by and by over the years. There are major dams across river Kangsabati, Mayurakshi and Damodar river systems. In the Damodar system, moderation of the dams during the peak flood is possible to some extent.

In North Bengal, an elaborate flood warning system maintained by the department warns the common people about the trend of rise of water level in rivers and thus alarms them to take necessary precautionary measures well beforehand. In Central and South Bengal, the water level of different rivers together with their danger and extreme danger levels and releases from different dams and barrages are intimated to different authorities from time to time during entire monsoons.

Besides this, the department continuously maintains close liaison with the Regional Meteorological Centre (RMC), Kolkata and keeps continuous track of India Meteorological Department (IMD) website in order to collect dynamic information on weather condition during entire monsoon period. In critical situations, the department adopts appropriate measures commensurate with the circumstances. Central Water Commission (CWC) always extend their co-operation by providing different hydro-meteorological data under their jurisdiction.

In every monsoon, Central Flood Control Room (CFCR) is formed at headquarter to keep vigil of flood situation. It is operative round the clock and is always on high alert, with two toll-free landline numbers, one at the headquarters, Jalsampad Bhawan, Salt Lake, Kolkata and the other at office at Club Road, Jalpaiguri, North Bengal for communicating important information by common people. It collects daily hydro-meteorological and climatological data from all possible sources, prepares reports and disseminates to all concerned. Daily flood reports during entire monsoon period is also available in public domain in the departmental website www.wbiwd.gov.in.

This year, rainfall has been deficient in entire West Bengal, as such extent of flood situation has been controllable. In spite of that, for few damages that has occurred due to flash flood, appropriate action is undertaken for its restoration.

24/5/2019.

(Sujoy Patra)
Deputy Director (District Plan)
Advance Planning, Project
Evaluation & Monitoring Cell
Irrigation & Waterways Directorate

24/5/2019

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24/5/2019

(Arup Kumar Basu)
Chief Engineer (Design & Research)
Irrigation & Waterways Directorate

ANNEXURE – I

Sl. No.	RIVER	Tributaries		Location	
		Primary	Secondary	STATE	District
1	2	3	4	5	6
BASIN 2A: BRAHAMAPUTRA		SUB-BASIN: LOWER BRAHAMAPUTRA			
1	Sankosh			Assam	Kokrajhar
				WB	Coochbehar
		Chhoto Sankosh		Assam	Kokrajhar
				WB	Alipurduar
		Raidak-II		WB	Alipurduar, Coochbehar
2	Torsa			WB	Alipurduar, Coochbehar
		Raidak-I	Dhakshi	WB	Alipurduar, Coochbehar
		Gadadhar	Jayanti	WB	Alipurduar
		Kaljani	Bala	WB	Alipurduar
			Nonai	WB	Alipurduar
			Dima	WB	Alipurduar
			Pana	WB	Alipurduar
			Garam	WB	Alipurduar
			Bania	WB	Alipurduar
			Ghargharia	WB	Alipurduar, Coochbehar
		Holong		WB	Alipurduar, Coochbehar
		Dharala		WB	Coochbehar
3	Jaldhaka			WB	Jalpaiguri, Coochbehar
		Mujnai	Titi	WB	Alipurduar
			Pagli	WB	Alipurduar
			Ekti	WB	Alipurduar
			Shukti	WB	Alipurduar
		Jurapani	Dudua	WB	Jalpaiguri, Alipurduar
			Gilandi	WB	Jalpaiguri
		Diana	Longit	WB	Jalpaiguri
		Khuji Diana	Chetia	WB	Jalpaiguri
		Jiti		WB	Jalpaiguri
		Murti		WB	Jalpaiguri
		Sutanga		WB	Coochbehar
		Jarda	Bagdan	WB	Jalpaiguri, Coochbehar
		Dolong		WB	Coochbehar
4	Teesta			Sikkim	North Sikkim, South Sikkim
				WB	Darjeeling, Jalpaiguri, Coochbehar
		Lachung	Yumthang	Sikkim	North Sikkim
		Lasha		Sikkim	North Sikkim
		Lohnak	Poke, Gome	Sikkim	North Sikkim
		Rangyung	Ringpi, Rukel	Sikkim	North Sikkim
		Chakung		Sikkim	North Sikkim
		Dick		Sikkim	North Sikkim
		Rangit	Rimbi	Sikkim	West Sikkim
			Kalej	Sikkim	West Sikkim
			Rammam	Sikkim	West Sikkim
			Little Rangit	WB	Darjeeling
		Rani		Sikkim	East Sikkim
		Rangpo	Nathang	Sikkim	East Sikkim
		Relli		WB	Darjeeling
		Rangio		WB	Darjeeling
		Leesh		WB	Darjeeling, Jalpaiguri
		Gheesh		WB	Darjeeling, Jalpaiguri
		Dharala		WB	Jalpaiguri
			Neora	WB	Darjeeling, Jalpaiguri
			Chel	WB	Darjeeling, Jalpaiguri
		Karla		WB	Jalpaiguri

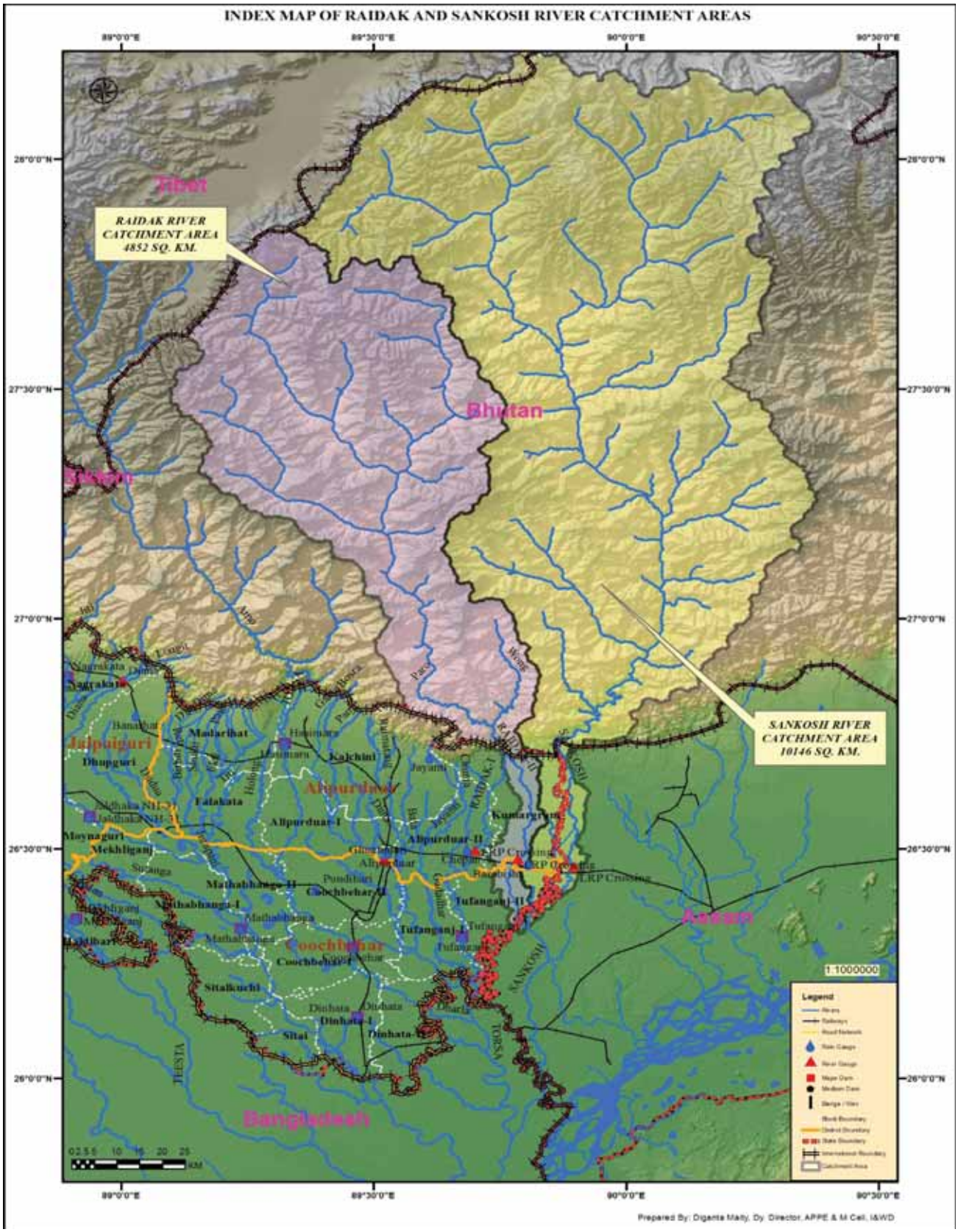
Sl. No.	RIVER	Tributaries		Location	
		Primary	Secondary	STATE	District
1	2	3	4	5	6
BASIN 2B: GANGA		SUB-BASIN: BHAGIRATHI LOWER & OTHERS			
1	Mahananda			WB	Darjeeling, Uttar Dinajpur, Malda
				Bihar	Kishanganj, Purnia
		Balason	Rohini	WB	Darjeeling
		Lachka		WB	Darjeeling
		Taipu	Manjha	WB	Darjeeling
		Mechi	Biring	Bihar	Kishanganj
		Kankai	Ratwa	Bihar	Kishanganj, Purnia
		Panar		Bihar	Araria, Purnia, Katihar
			Bakra	Bihar	Araria, Purnia
			Kesaliya	Bihar	Araria, Purnia
		Dauk		WB	Uttar Dinajpur
		Pitani	Bakuna	WB	Uttar Dinajpur
		Nagar	Sudhani	WB	Uttar Dinajpur
			Kulik	WB	Uttar Dinajpur
		Chiramati		WB	Uttar Dinajpur
		Sui		WB	Uttar Dinajpur
		Tangon		WB	Uttar & Dakshin Dinajpur, Malda
		Mora Mahananda		WB	Malda
		Kalindri		WB	Malda
2	Fulhar			Bihar	Katihar
				WB	Malda
3	Punarbhaba			WB	Dakshin Dinajpur, Malda
4	Atreyee			WB	Dakshin Dinajpur
		Kartowa	Neem	WB	Jalpaiguri
			Sahoo	WB	Jalpaiguri
			Chauli	WB	Jalpaiguri
			Talma	WB	Jalpaiguri
		Panga		WB	Jalpaiguri
		Jamuna		WB	Dakshin Dinajpur
		Brahmani		WB	Dakshin Dinajpur
5	Ganga-Padma	Pagla		WB	Malda
		Gumani		WB	Murshidabad
				Jharkhand	Godda, Sahebganj
6	Bansloi			Jharkhand	Pakur
				WB	Birbhum, Murshidabad
		Bagmari		Jharkhand	Pakur
				WB	Murshidabad
		Krilor		WB	Murshidabad
7	Pagla			Jharkhand	Pakur
				WB	Birbhum, Murshidabad
		Buri		WB	Birbhum
8	Dwarka	Brahamani		Jharkhand	Dumka
				WB	Birbhum, Murshidabad
			Gumra	Jharkhand	Dumka
			Tripti	Jharkhand	Dumka
				WB	Birbhum
		Gambhira	Gamri	WB	Birbhum, Murshidabad
		Chailan		Jharkhand	Dumka
				WB	Birbhum
		Ghormora		WB	Birbhum
		Kajuli		WB	Birbhum
		Daoka	Manikarnika	WB	Birbhum, Murshidabad
		Banka		WB	Murshidabad

Sl. No.	RIVER	Tributaries		Location	
		Primary	Secondary	STATE	District
1	2	3	4	5	6
9	**Mayurakshi**			Jharkhand	Deoghar, Dumka
				WB	Birbhum, Murshidabad
		Dhabai		Jharkhand	Dumka
		Bhurbhuri		Jharkhand	Dumka
		Tepra		Jharkhand	Dumka
		Siddeswari		Jharkhand	Jamtara, Deoghar, Dumka
			Noonbeel	Jharkhand	Deoghar
		Kushkarini		Jharkhand	Jamtara
				WB	Birbhum
		Kuia	Bakreswar	WB	Birbhum, Murshidabad
				Jharkhand	Jamtara
			Kopai	WB	Birbhum
10	**Babla**	Mayurakshi		WB	Murshidabad
		Dwarka		WB	Murshidabad
11	**Ajay**			Bihar	Munger
				Jharkhand	Deoghar, Jamtara
		Dudhwa		Bihar	Munger
				Jharkhand	Deoghar
		Pathro		Jharkhand	Giridih, Deoghar
		Pathro		Jharkhand	Giridih, Deoghar
		Hinglow	Amba	Jharkhand	Jamtara
				WB	Birbhum
		Tumoni		WB	Burdwan
		Kunur		WB	Burdwan
		Kana Ajay		WB	Birbhum, Burdwan
12	**Jalangi**			WB	Murshidabad, Nadia
		Sialamari		WB	Murshidabad
		Suti	ChhotoBhairab	WB	Murshidabad
			Bhandardaha	WB	Murshidabad
13	**Churni**	Anjana		WB	Nadia
14	**Ichhamati**	Jamuna		WB	Nadia, North 24-Parganas
15	**Bidyadhari**	Nowai		WB	North 24-Parganas
16	**Khari**	Brahmani		WB	Burdwan
		Banka		WB	Burdwan
17	**Behula**	Gangur		WB	Burdwan, Hooghly
18	**Kunti**			WB	Hooghly
19	**Ghea**	Kedarmati		WB	Burdwan, Hooghly
		Kana		WB	Burdwan, Hooghly
20	**Saraswati**			WB	Hooghly, Howrah
21	**Kana Damodar**			WB	Burdwan, Hooghly, Howrah
22	**Amta Channel**			WB	Burdwan, Hooghly, Howrah
23	**Kalindri**			WB	South 24-Parganas
24	**Raimangal**			WB	South 24-Parganas
25	**Bidya**			WB	South 24-Parganas
26	**Matla**			WB	South 24-Parganas
27	**Thakuran**			WB	South 24-Parganas
28	**Saptamukhi**			WB	South 24-Parganas
29	**Muriganga**			WB	South 24-Parganas
30	**Bhagirathi-Hooghly**			WB	Birbhum, Murshidabad, Nadia, Burdwan, Hooghly, Howrah, South & North 24 Parganas, Purba Medinipur

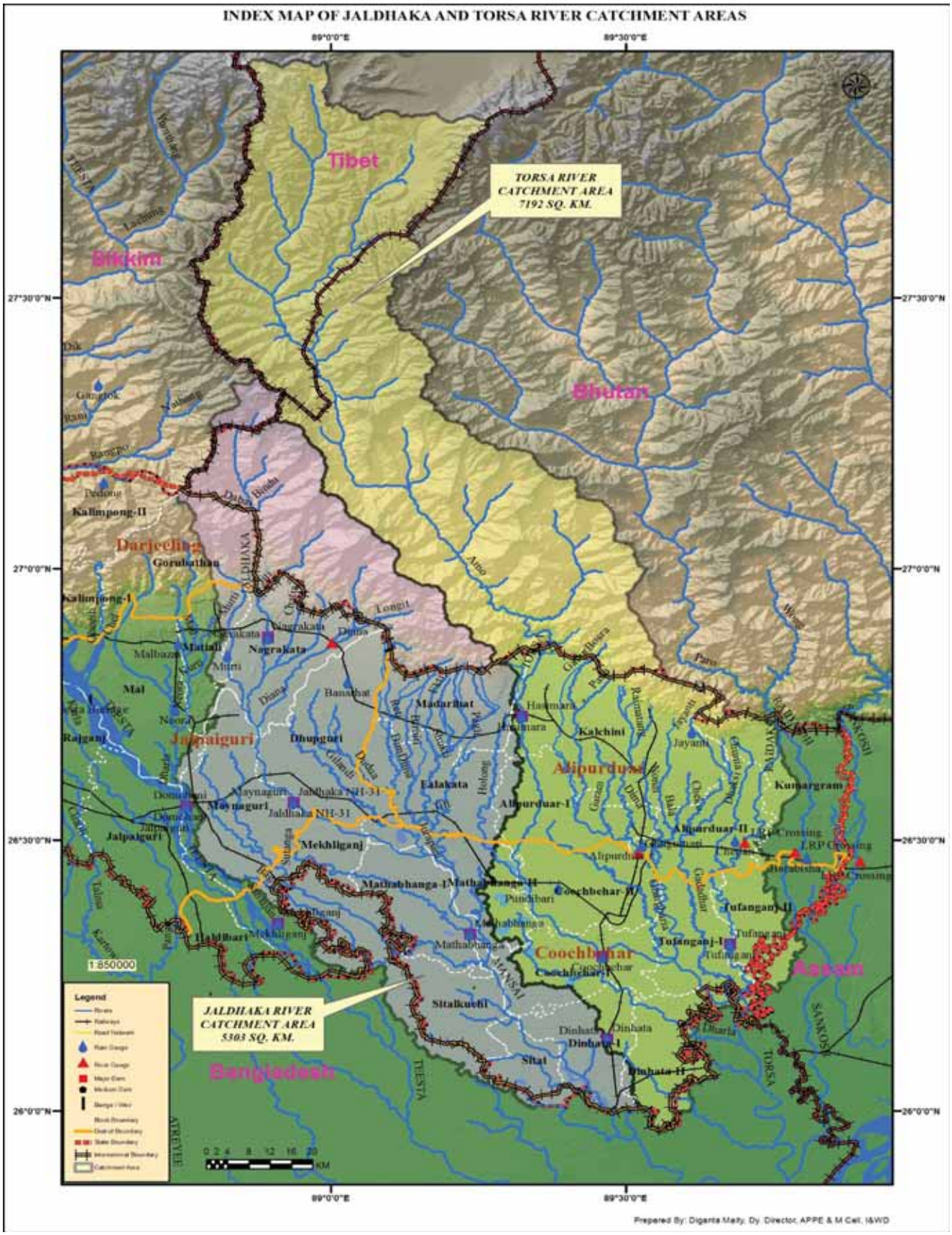
Sl. No.	RIVER	Tributaries		Location	
		Primary	Secondary	STATE	District
1	2	3	4	5	6
BASIN 2B: GANGA		SUB-BASIN: DAMODAR			
1	Damodar			Jharkhand	Latehar, Chatra, Hazaribag, Ramgarh, Bokaro Dhanbad
				WB	Burdwan, Purulia, Bankura, Hooghly,Howrah
		Barakar		Jharkhand	Hazaribag, Giridih, Kodarma, Dhanbad
			Igra	Jharkhand	Giridih
			Ushri		
			Dumohon	Jharkhand	Giridih
			Barsoti	Jharkhand	Hazaribag
		Barki		Jharkhand	Latehar, Chatra, Hazaribag
		Haharo		Jharkhand	Hazaribag
		Ghari		Jharkhand	Hazaribag
		Bokaro		Jharkhand	Hazaribag, Bokaro
		Konar		Jharkhand	Hazaribag, Bokaro
			Siwani	Jharkhand	Hazaribag
		Jamunia		Jharkhand	Hazaribag, Giridih, Bokaro, Dhanbad
		Naikari, Bhera		Jharkhand	Ranchi, Ramgarh
		Khanjo, Garga		Jharkhand	Bokaro
		Khadia, Katri		Jharkhand	Dhanbad
		Gowai, Ijri		Jharkhand	Bokaro
				WB	Purulia
		Sali		WB	Bankura
		Singar, Tamal		WB	Burdwan
		Nuna		WB	
3	Mundeswari	Harinkhola		WB	Burdwan, Hooghly
4	Darakeswar			WB	Purulia, Bankura, Burdwan, Hooghly
		Futiary, Beko, Dudhibheria		WB	Purulia
		Arkasha	Kansachor	WB	Purulia, Bankura
		Dangra		WB	Purulia, Bankura
		Gandheswari, Berai, Khukra		WB	Bankura
		Shankari		WB	Paschim Medinipur
			Amodar	WB	Bankura, Paschim Medinipur
			Tarajuli	WB	Bankura, Paschim Medinipur
5	Shilabati			WB	Purulia, Bankura, Paschim Medinipur
		Jaiponda		WB	Bankura
		Puratan, Champayan, Ketia		WB	Bankura, Paschim Medinipur
		Ruparghghra		WB	Paschim Medinipur
		Donai		WB	Paschim Medinipur
		Kubai	Tamal, Parang	WB	Paschim Medinipur
		Katan		WB	Paschim Medinipur

Sl. No.	RIVER	Tributaries		Location	
		Primary	Secondary	STATE	District
1	2	3	4	5	6
BASIN 2B: GANGA			SUB-BASIN: DAMODAR		
6	Kangsabati			WB	Purulia, Bankura, Paschim Medinipur
		Saharjore, Bandhu, Patloi		WB	Purulia
		Kumari	Hanumata, Kerro, Jore, Charan	WB	Purulia
		Jam		WB	Paschim Medinipur, Bankura, Purulia
			Tatko	Jharkhand	PurbaSingbhum
				WB	Purulia
		Bhairabbanki	Jhinuk	WB	Bankura, Paschim Medinipur
			Tarapheni	WB	Paschim Medinipur
		Kalaichu		WB	Paschim Medinipur
7	Old Cossye			WB	Paschim Medinipur
8	New Cossye	Kherai	Bakshi	WB	Paschim &PurbaMedinipur
9	Rupnarayan	Kana Dwarakeswar		WB	Hooghly, Burdwan
		Polashpai		WB	Paschim Medinipur
		Durbachaty		WB	PurbaMedinipur
10	Kaliaghai			WB	Paschim &PurbaMedinipur
		Kapaleswari, Deuli		WB	Paschim Medinipur
		Chandia		WB	Paschim &PurbaMedinipur
		Baghai		WB	Paschim &PurbaMedinipur
11	Haldi			WB	PurbaMedinipur
12	Rasulpur			WB	PurbaMedinipur
13	Pichabani			WB	PurbaMedinipur
14	Negua Channel			WB	Paschim &PurbaMedinipur
BASIN 6: SUBARNAREKHA					
1	Subarnarekha			Jharkhand	Ranchi, Seraikela-Kharswan,PurbaShingbhum
				WB	Paschim Medinipur
				Odisha	Balasore
		Jhumur, Rupai		Jharkhand	Ranchi
		Kakro	Rarhu	Jharkhand	Ranchi
		Karru		Jharkhand	Ranchi
				WB	Purulia
		Kanchi		Jharkhand	Ranchi
		Damra		Jharkhand	Ranchi, Seraikela-Kharswan
		Karkari		Jharkhand	Ranchi, Seraikela-Kharswan
		Chinguru		WB	Purulia
				Jharkhand	Seraikela-Kharswan
		Kharkai	Bankabol, Khadkari, Kandria, Nesa, Burhai	Odisha	Mayurbhanj
			Torlo, Illgara, Roro, Sanjai	Jharkhand	Paschim Shingbhum
		Garra, Sankh, Kodia		Jharkhand	PurbaShingbhum
		Gurma		Jharkhand	PurbaShingbhum
				WB	Purulia
		Singaduba		Jharkhand	PurbaShingbhum
				WB	Paschim Medinipur
		Dulung, Khaijori		WB	Paschim Medinipur

ANNEXURE-II/1



ANNEXURE-II/2



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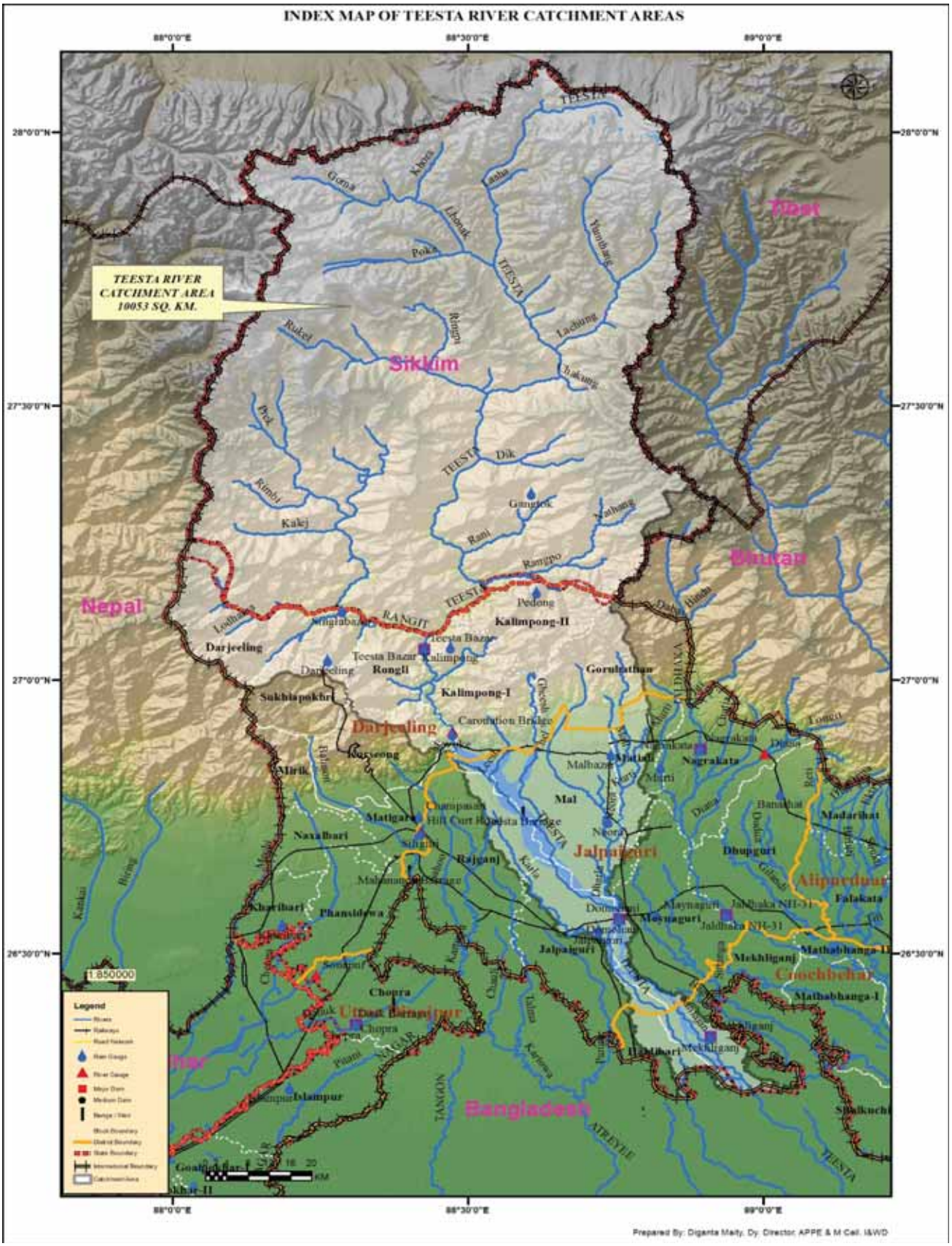
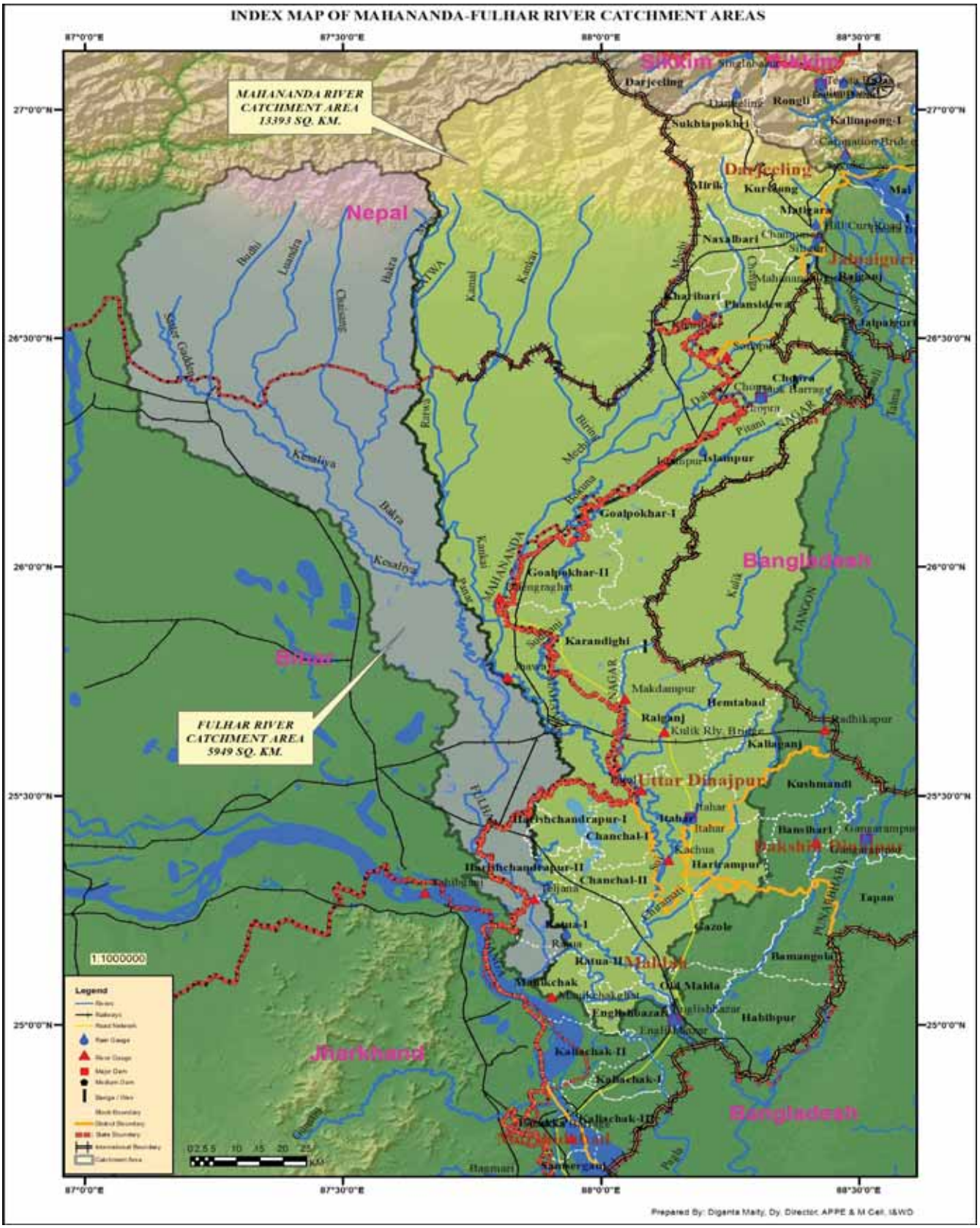


ANNEXURE-II/4



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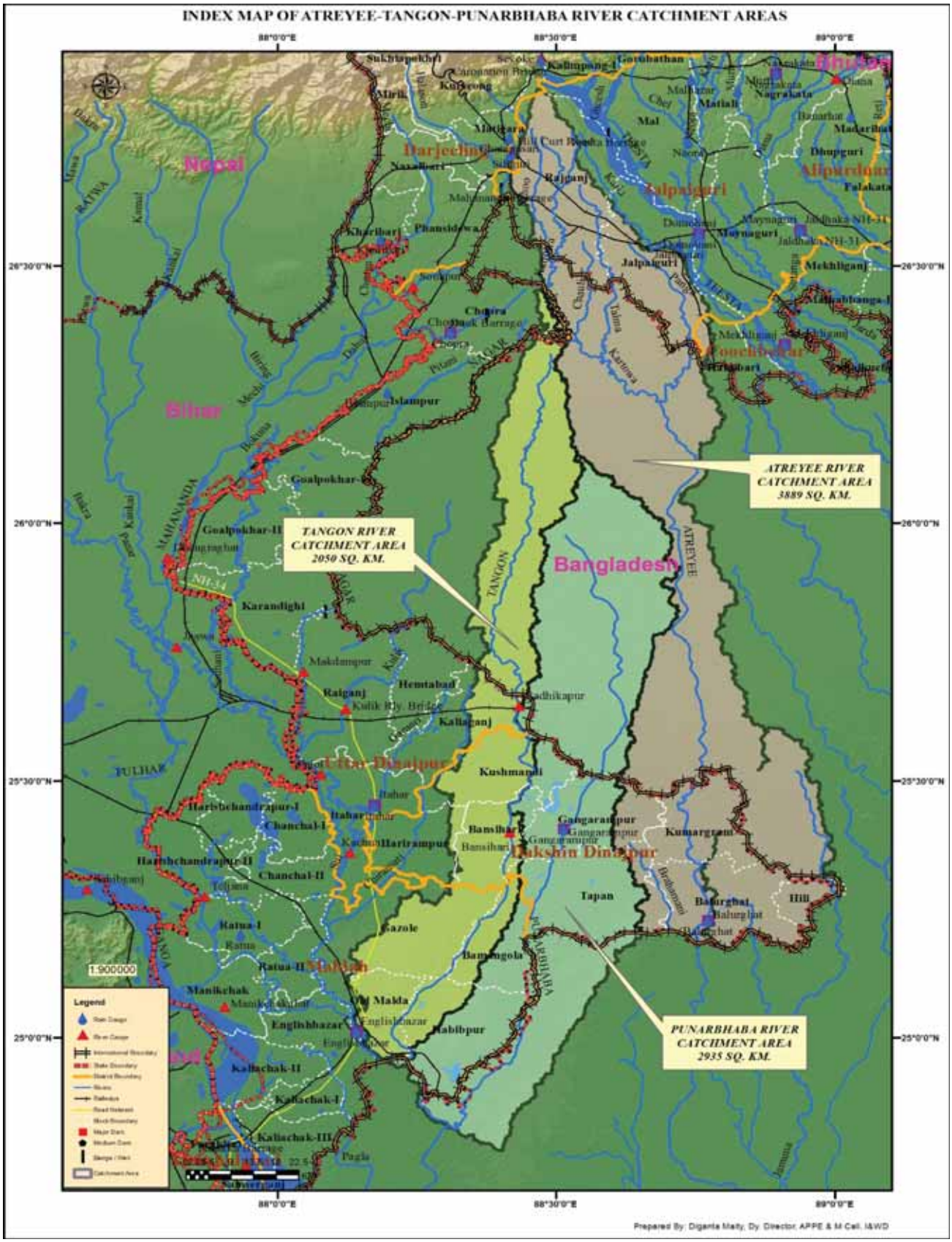

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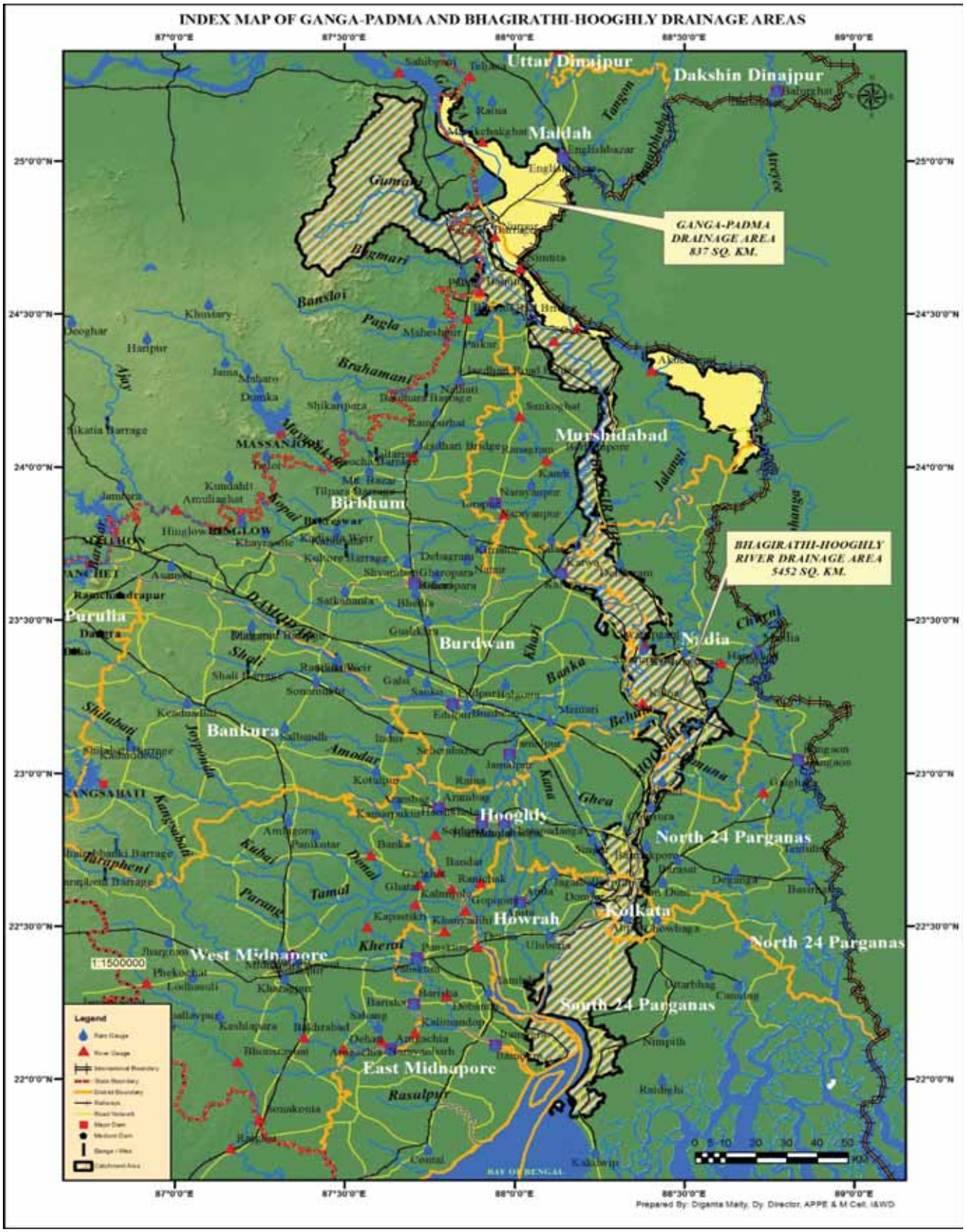
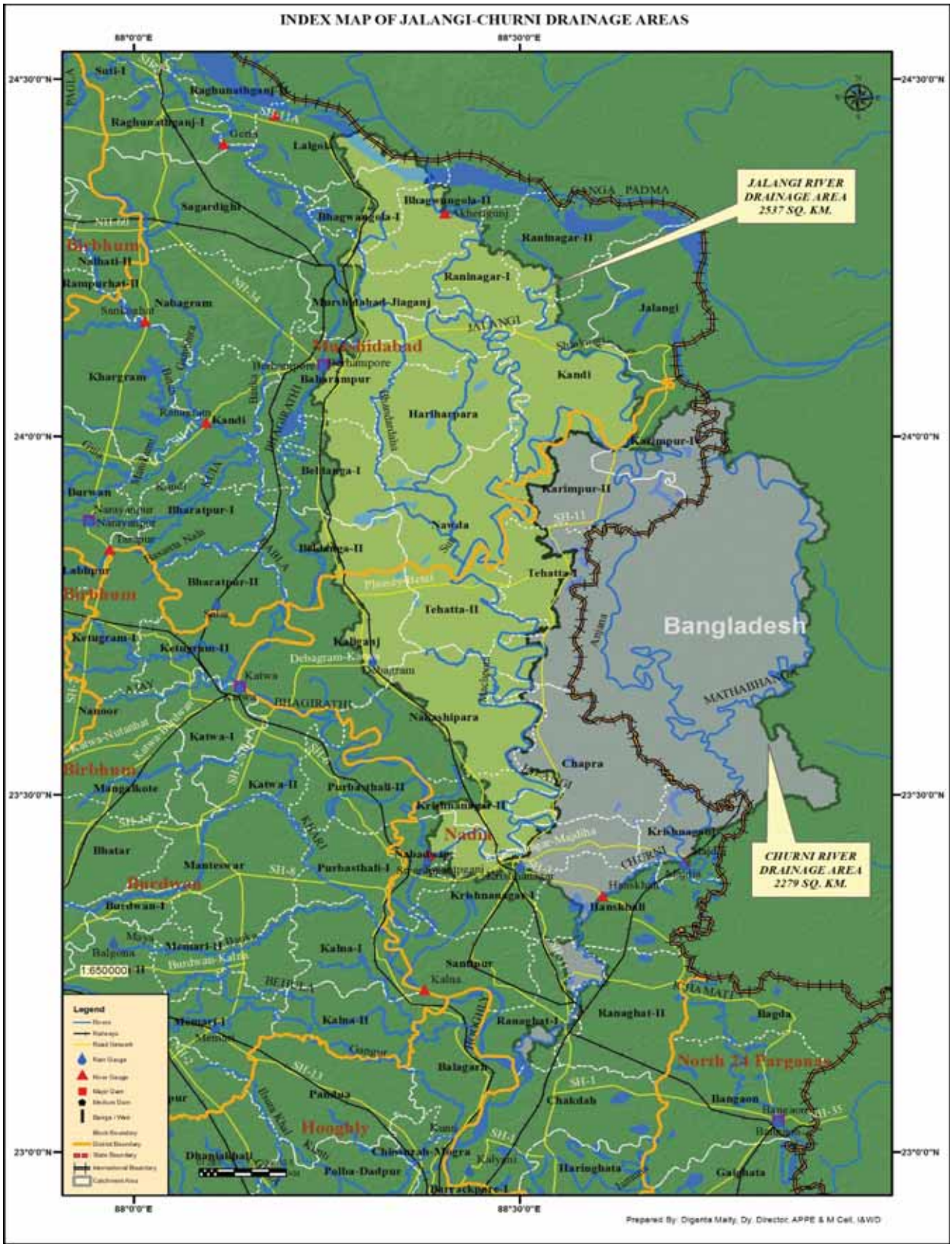
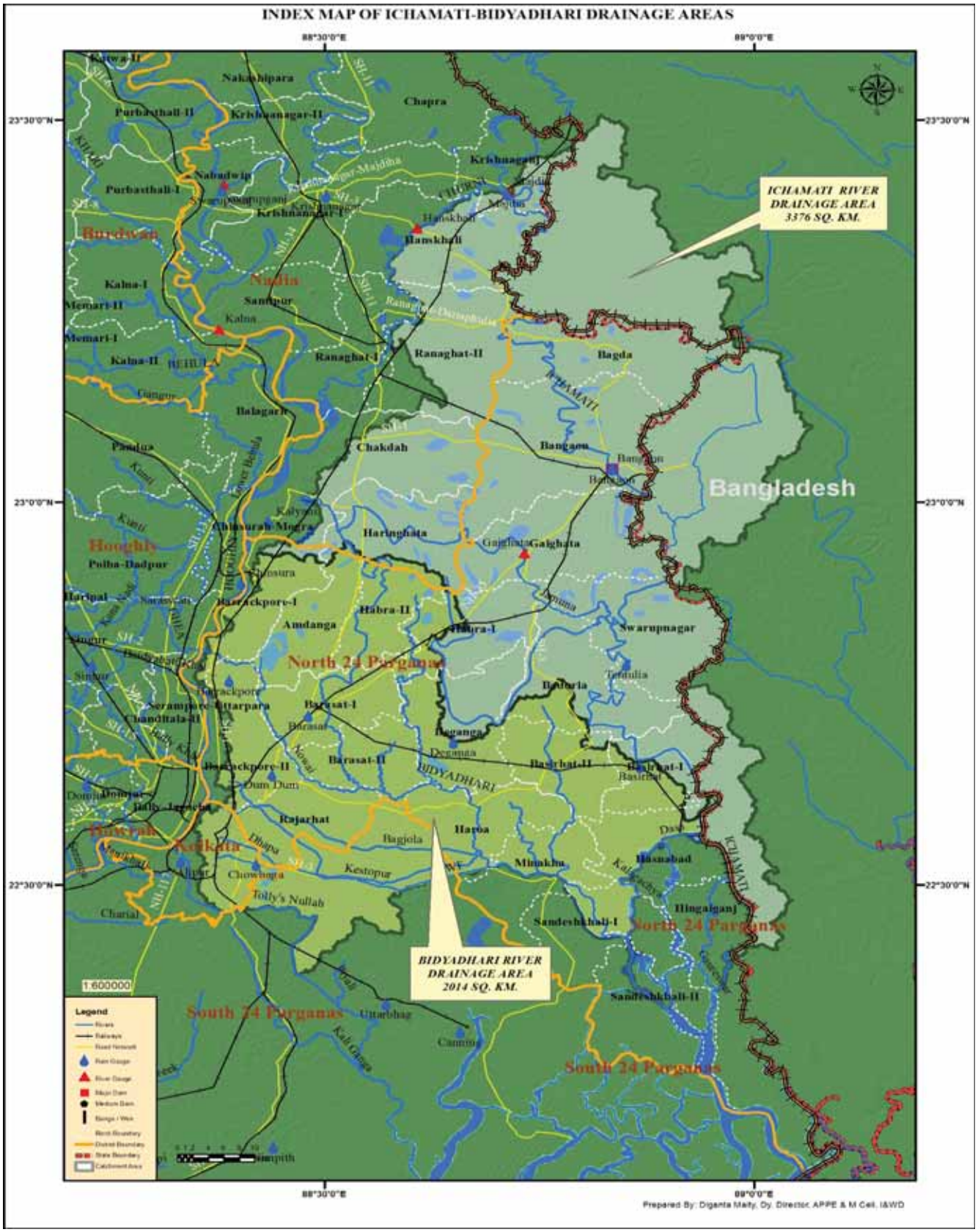


ANNEXURE-II/7



ANNEXURE-II/8



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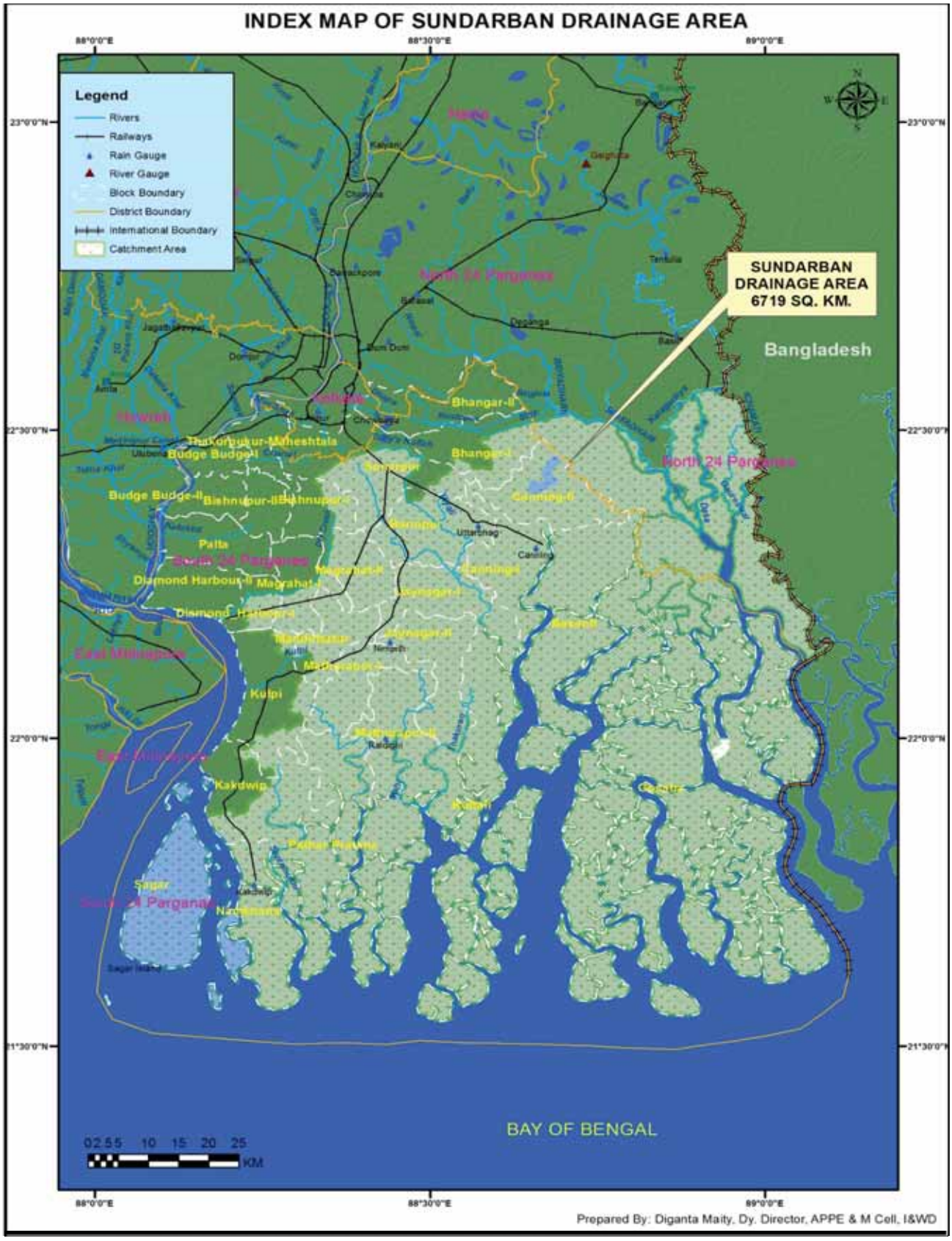
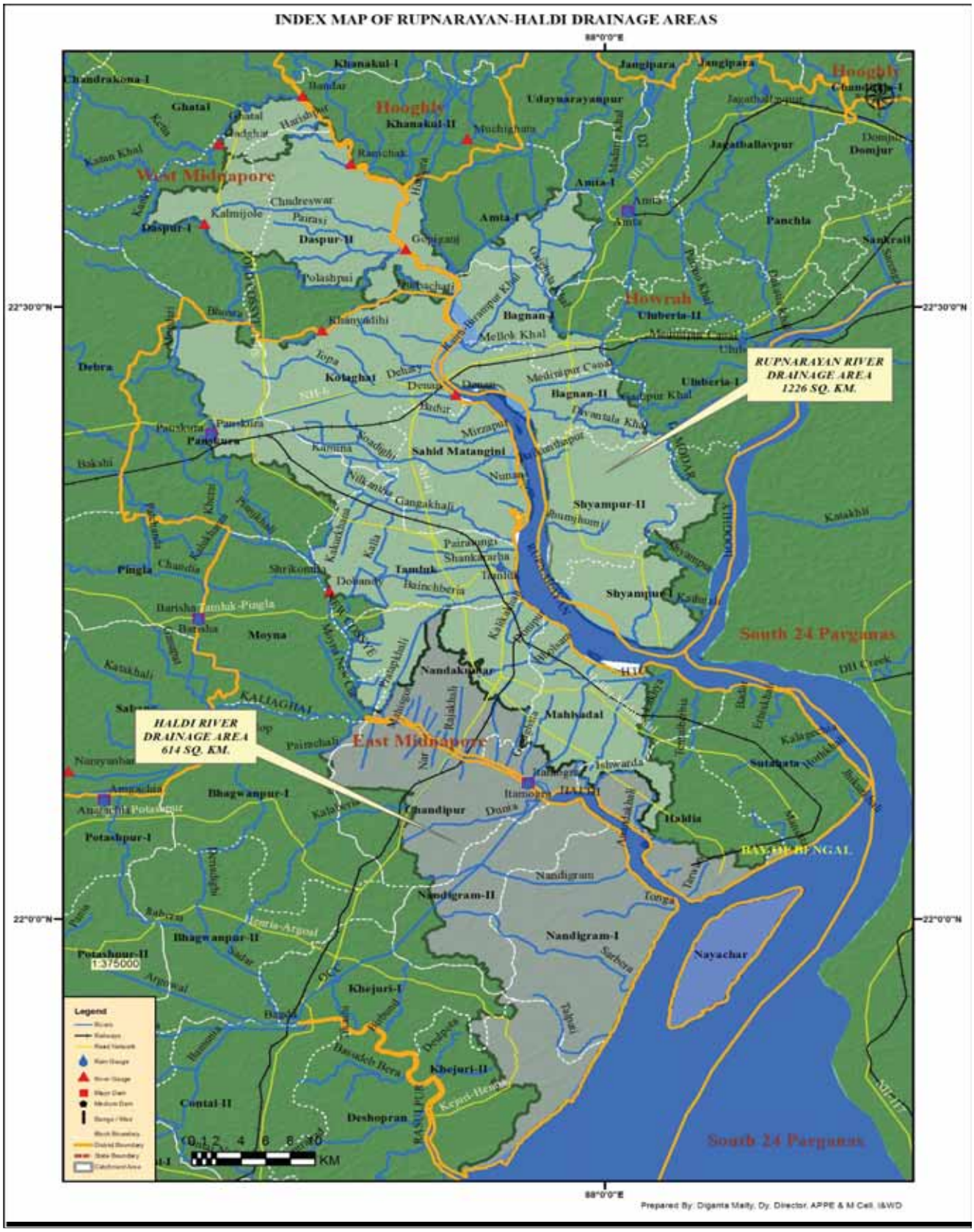
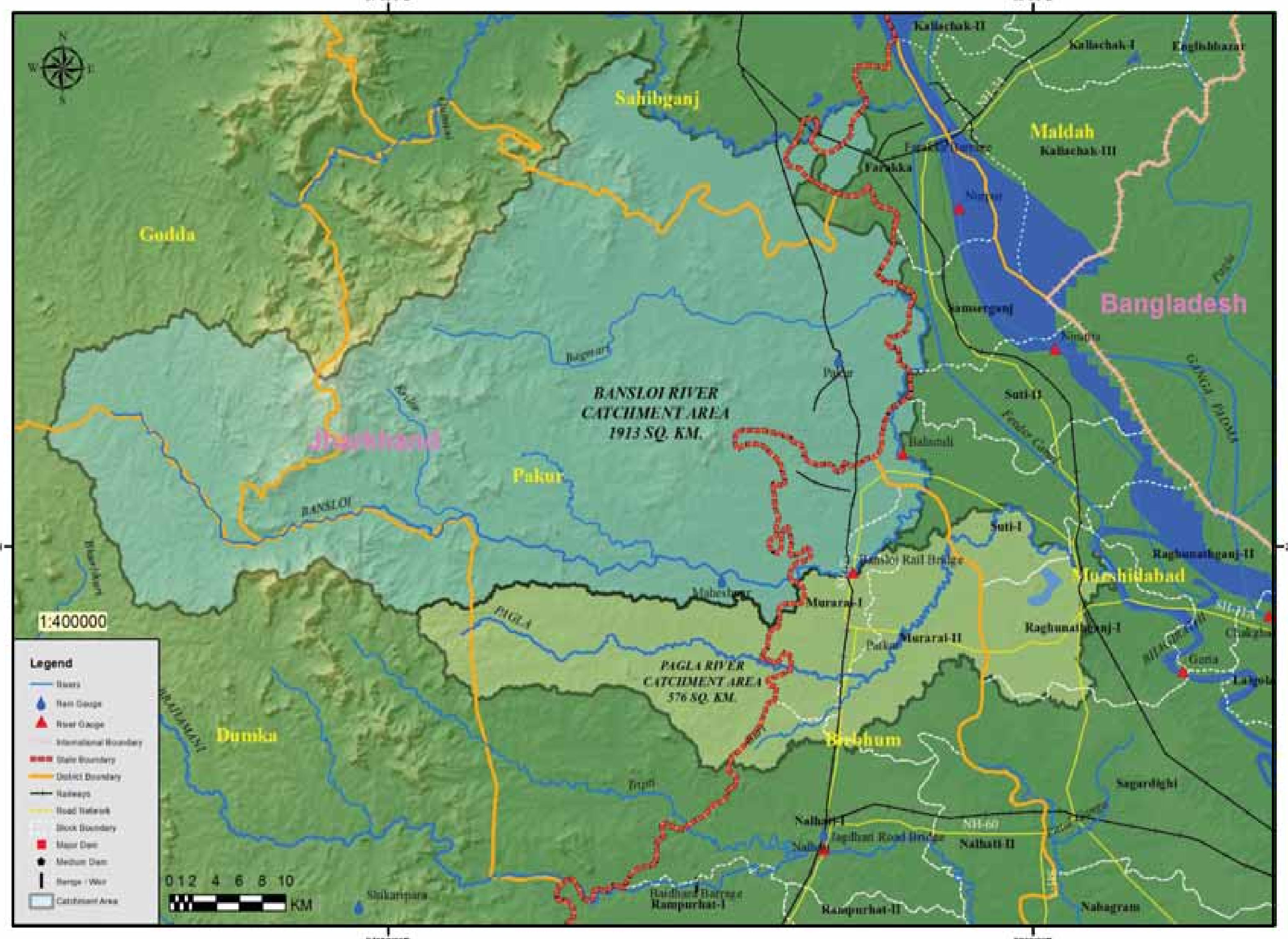


ANNEXURE-II/10



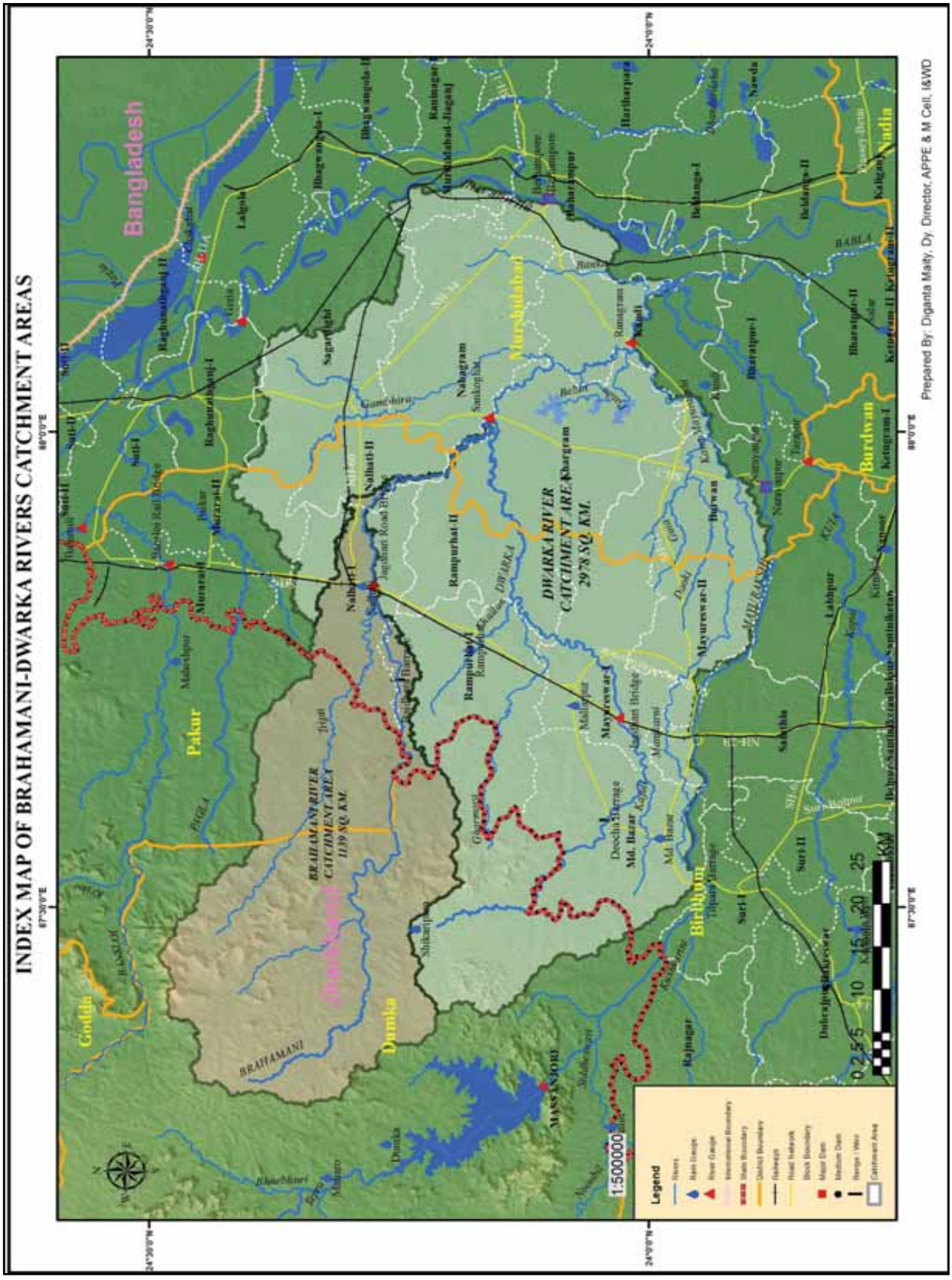
ANNEXURE-II/11

INDEX MAP OF PAGLA-BANSLOI RIVERS CATCHMENT AREAS

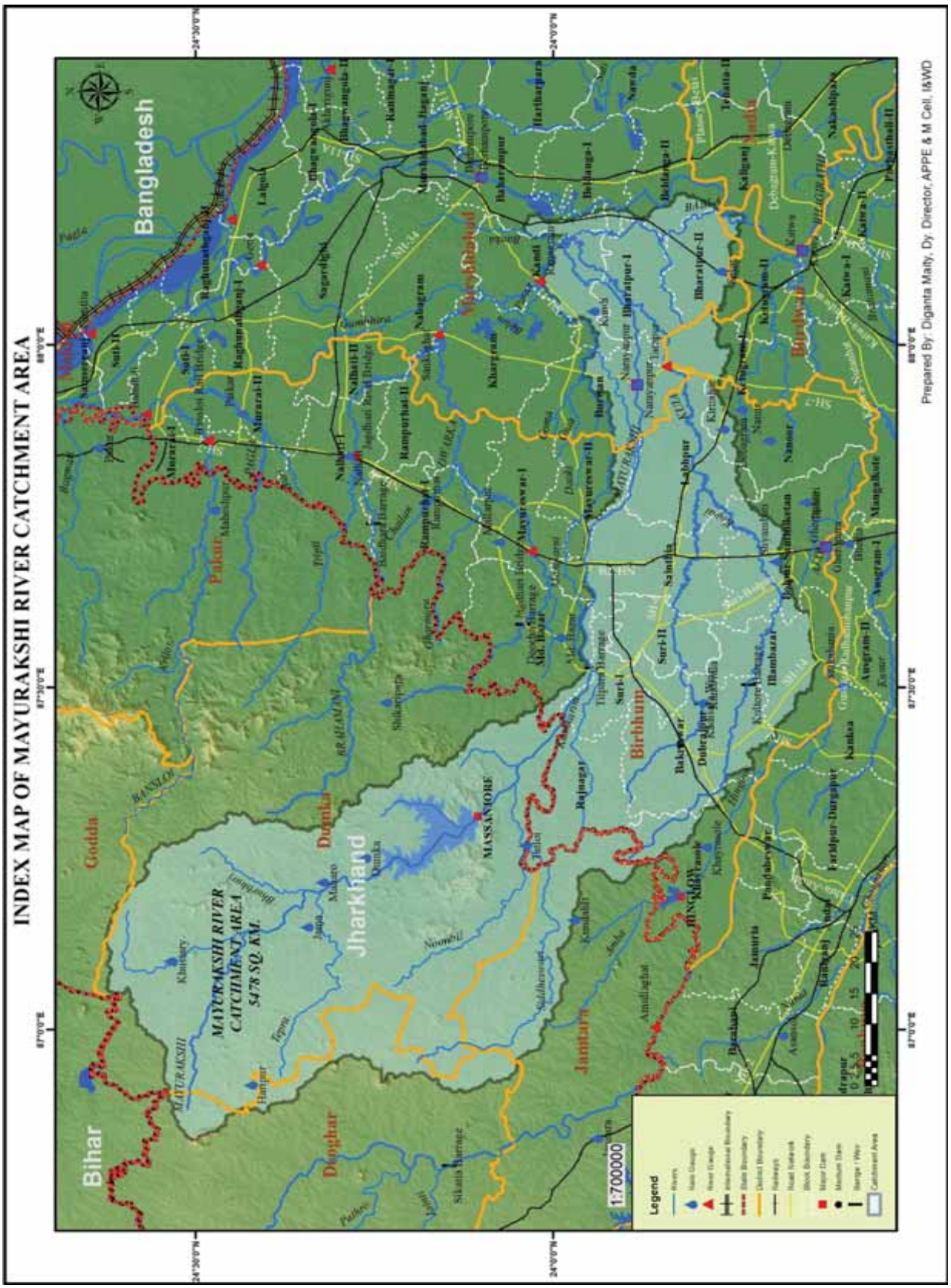


Prepared By: Diganta Maity, Dy. Director, APPE & M Cell, I&WD

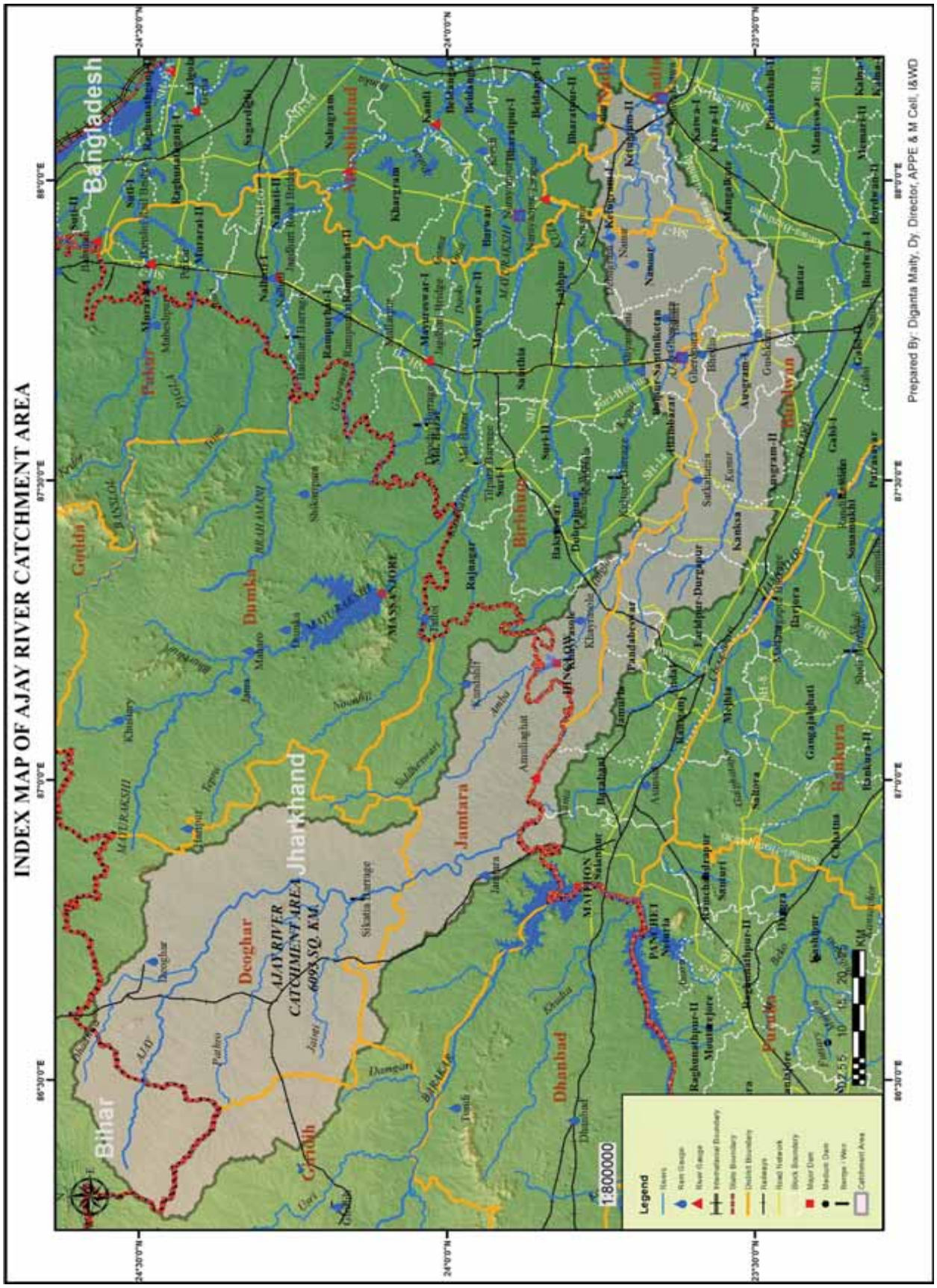
ANNEXURE-II/12



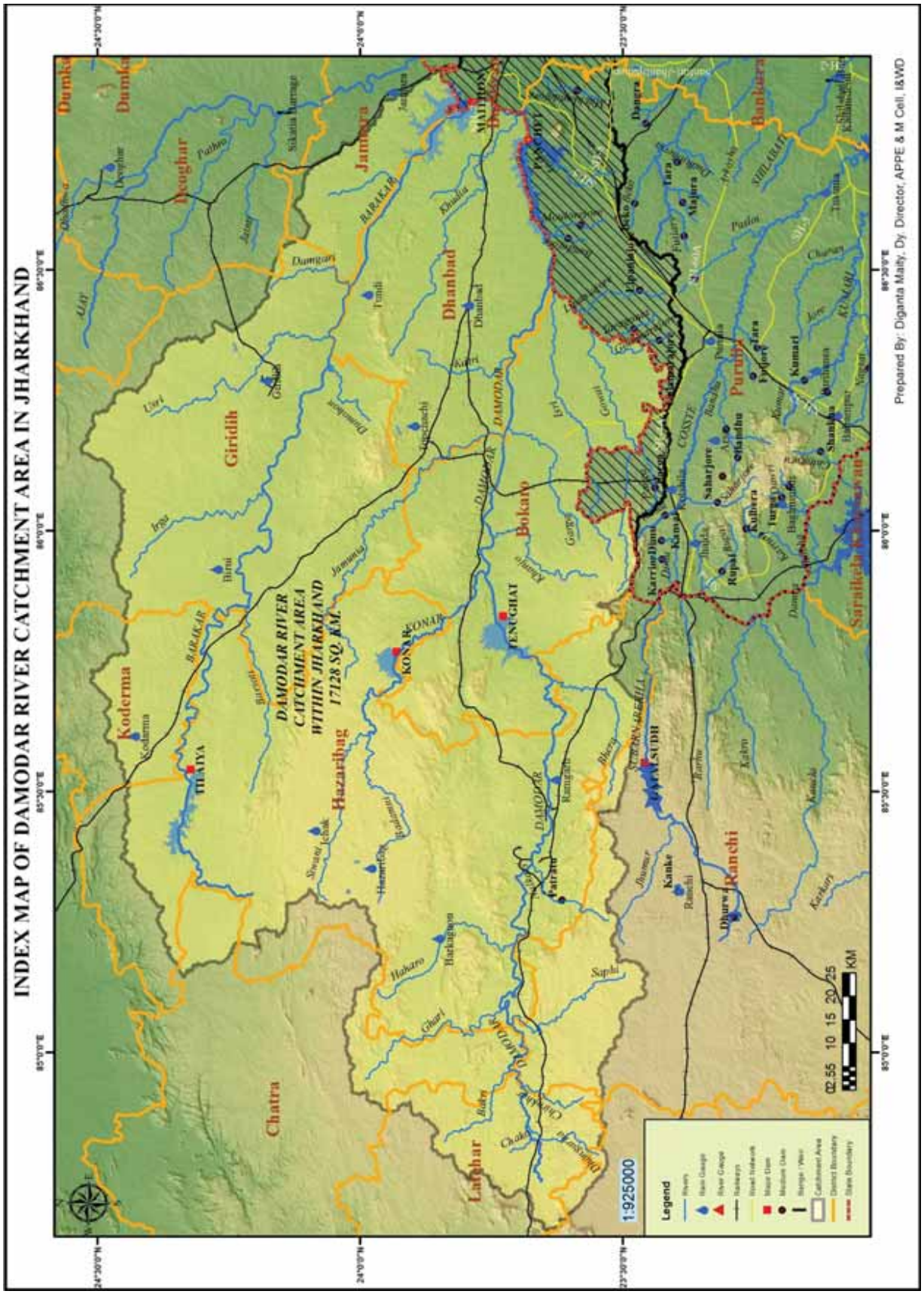
ANNEXURE-II/13



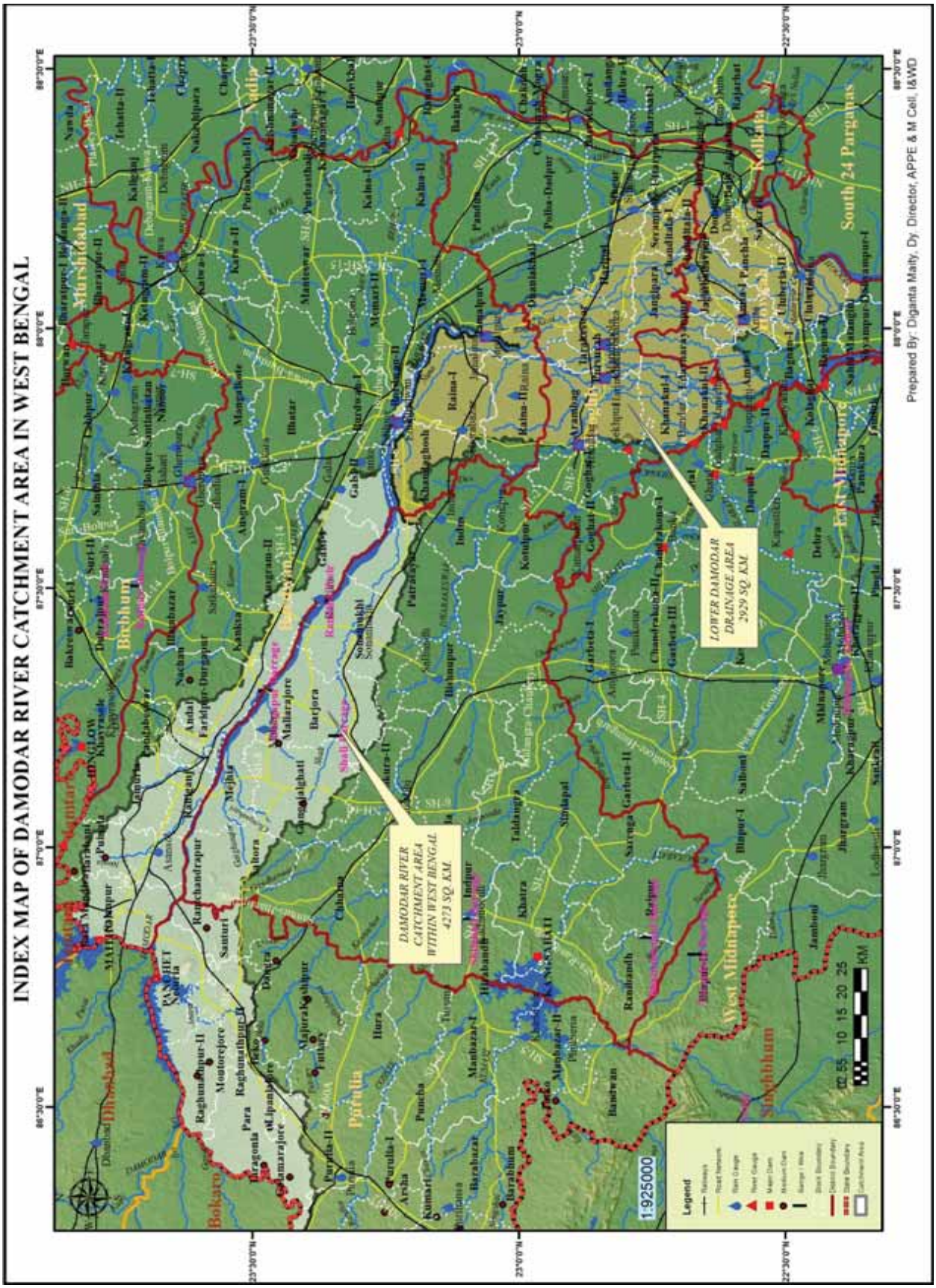
ANNEXURE-II/14



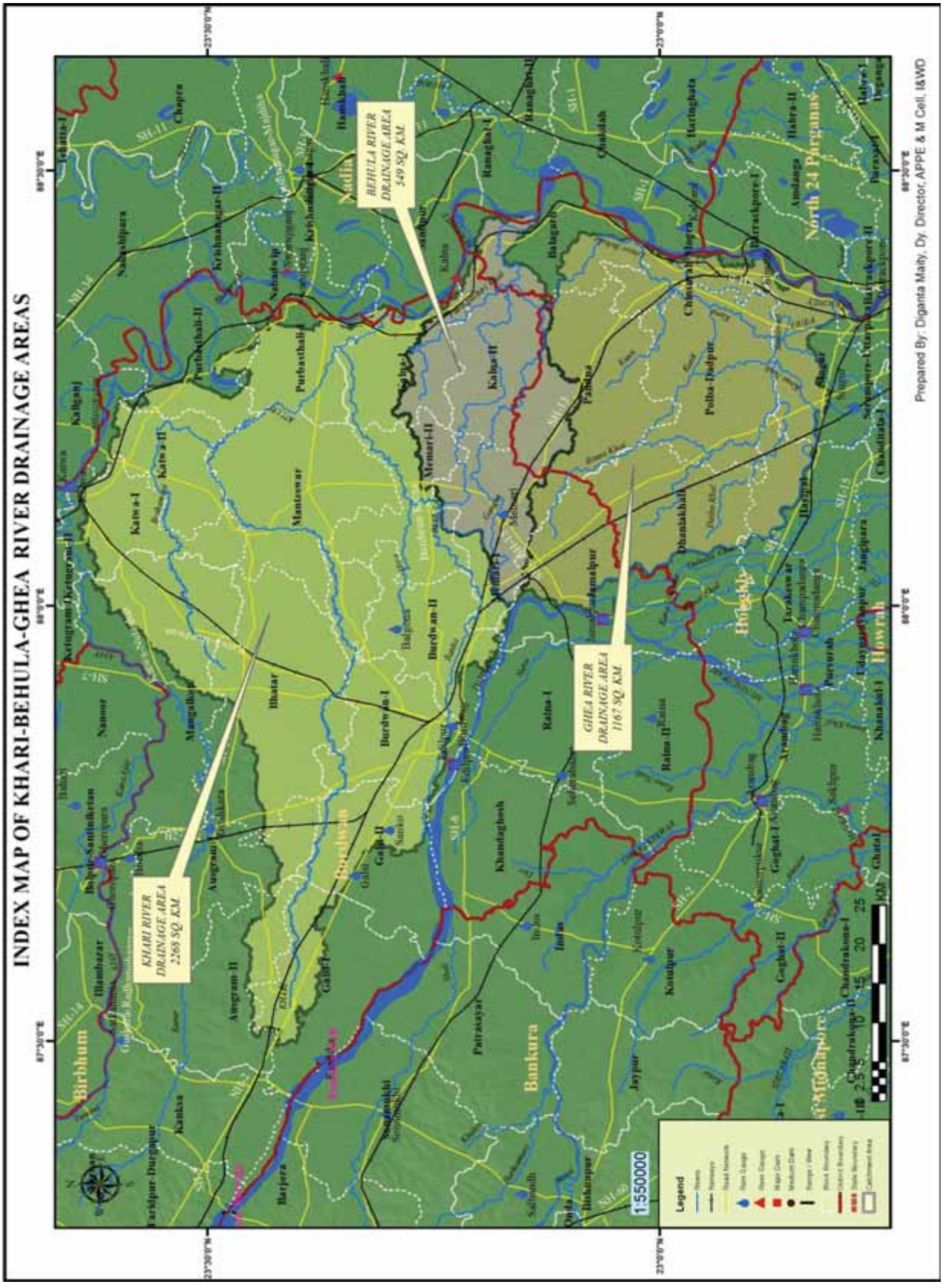
ANNEXURE-II/15



ANNEXURE-II/16



ANNEXURE-II/17



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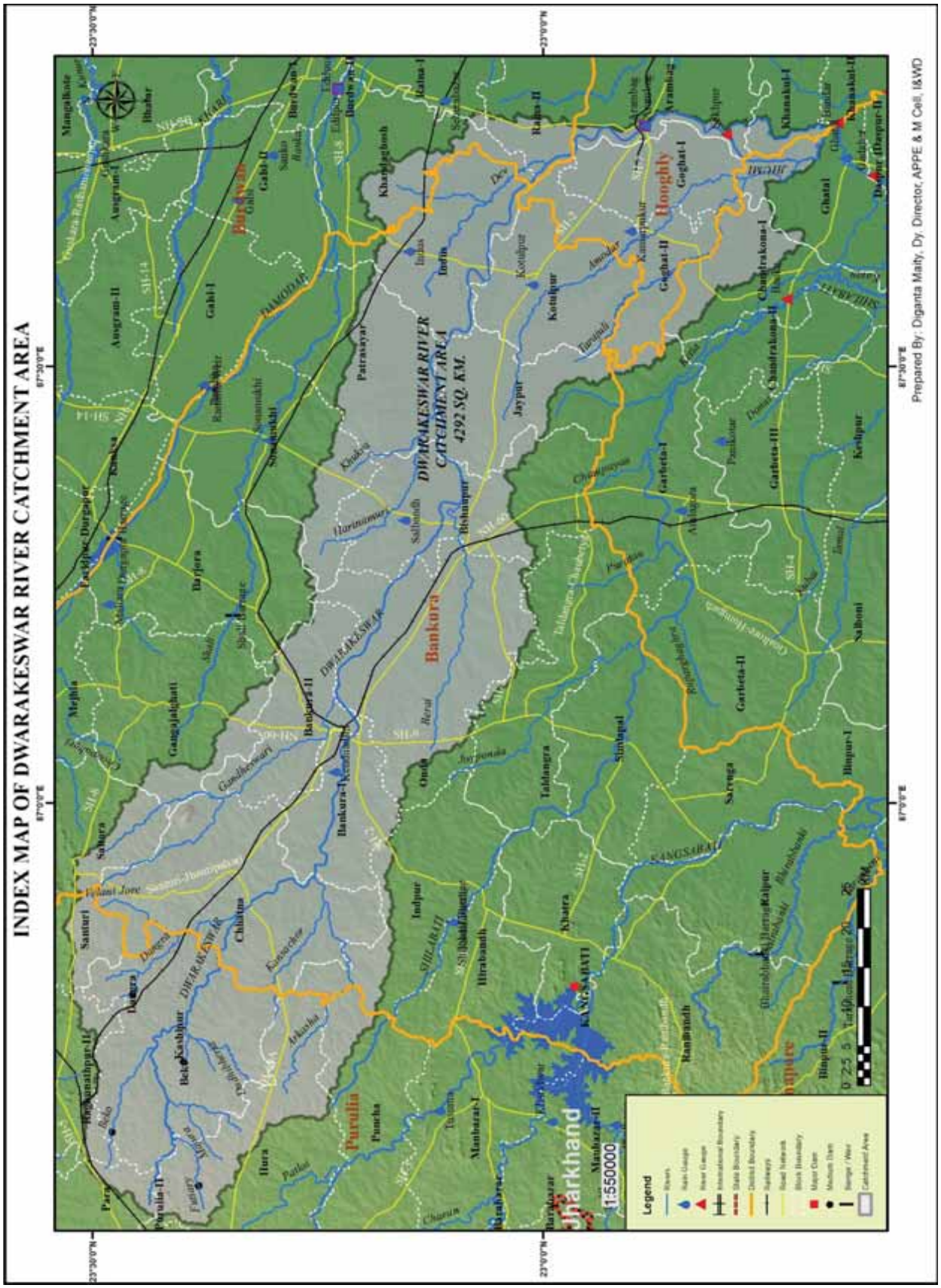

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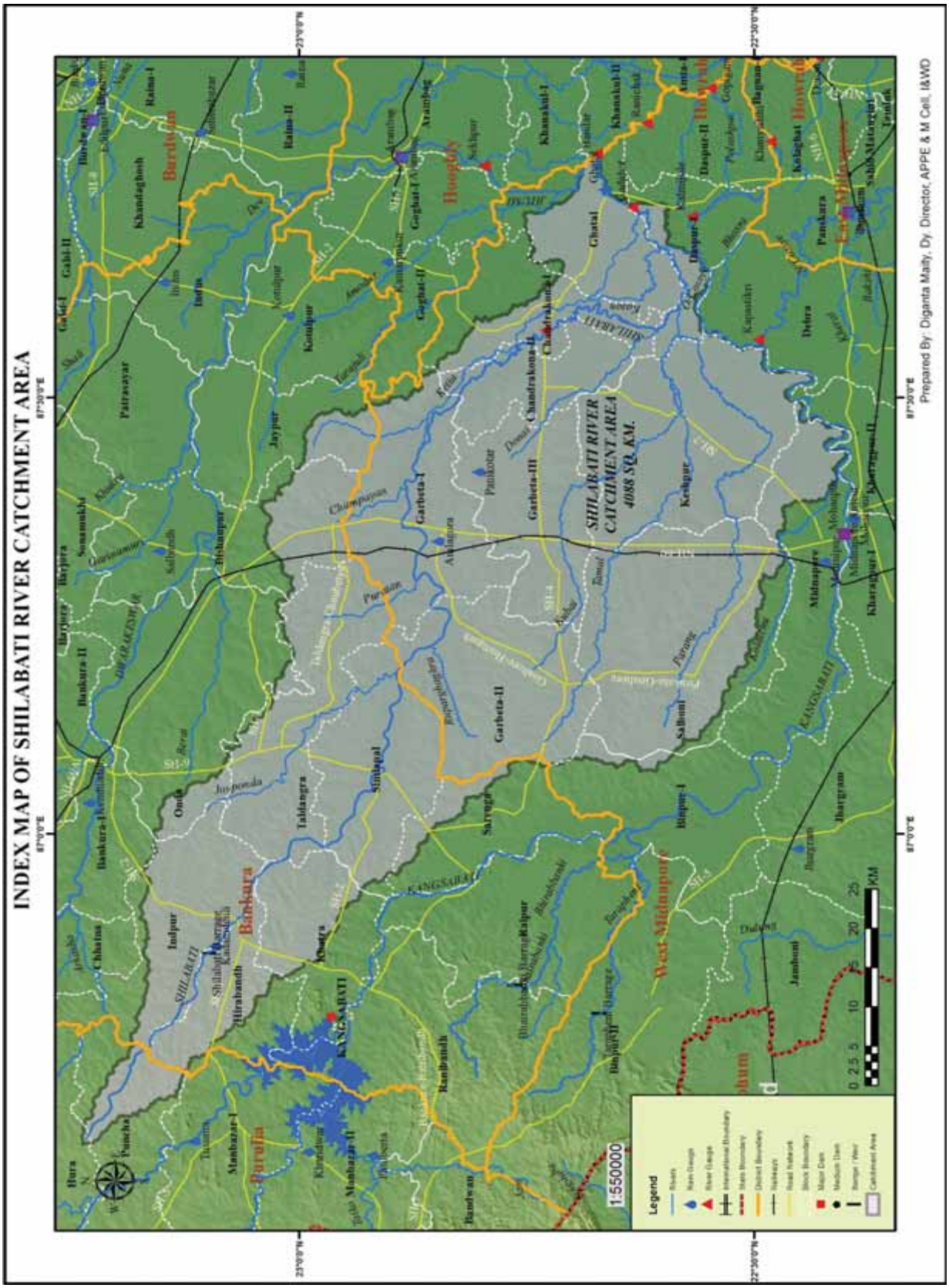

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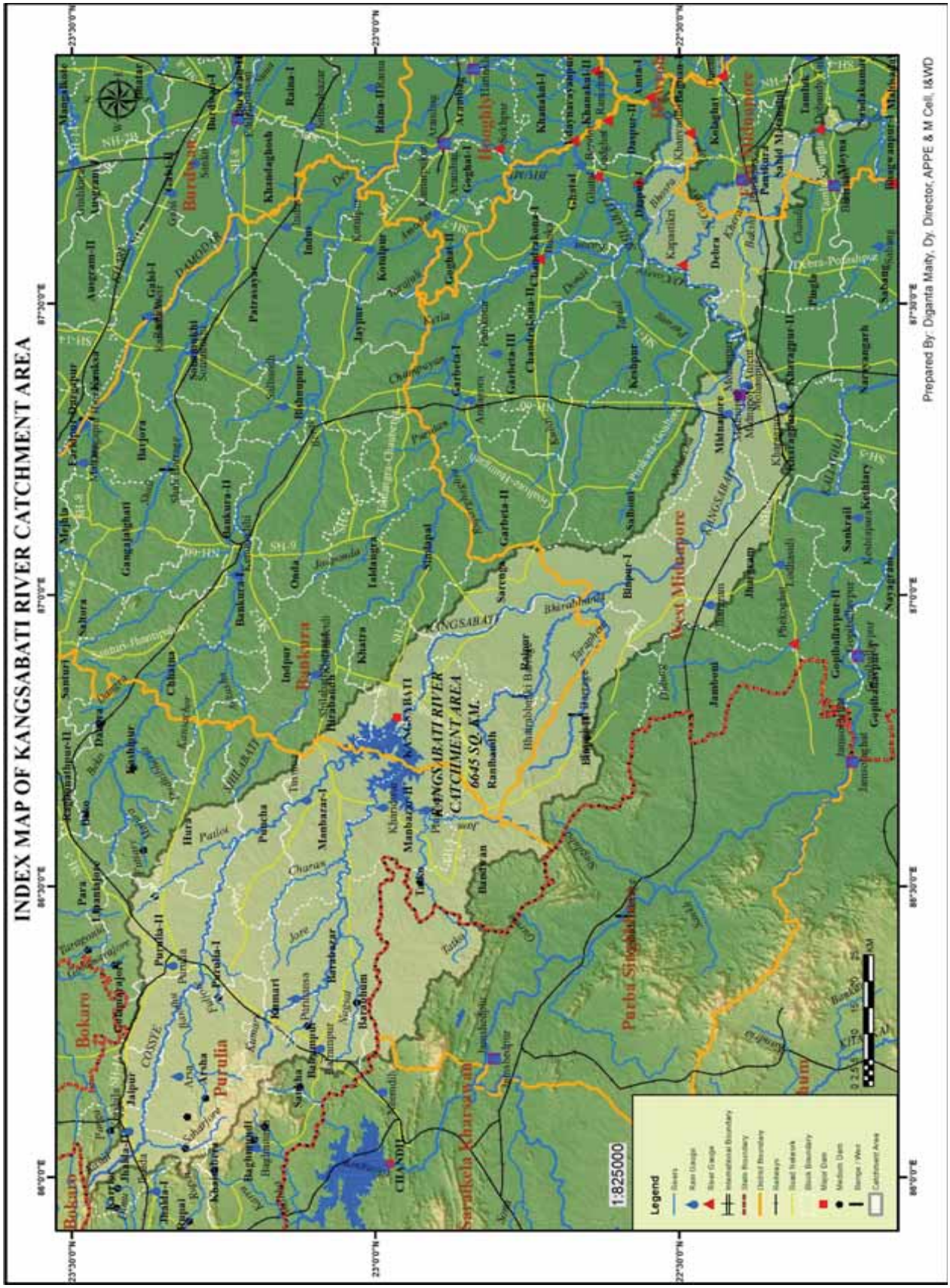

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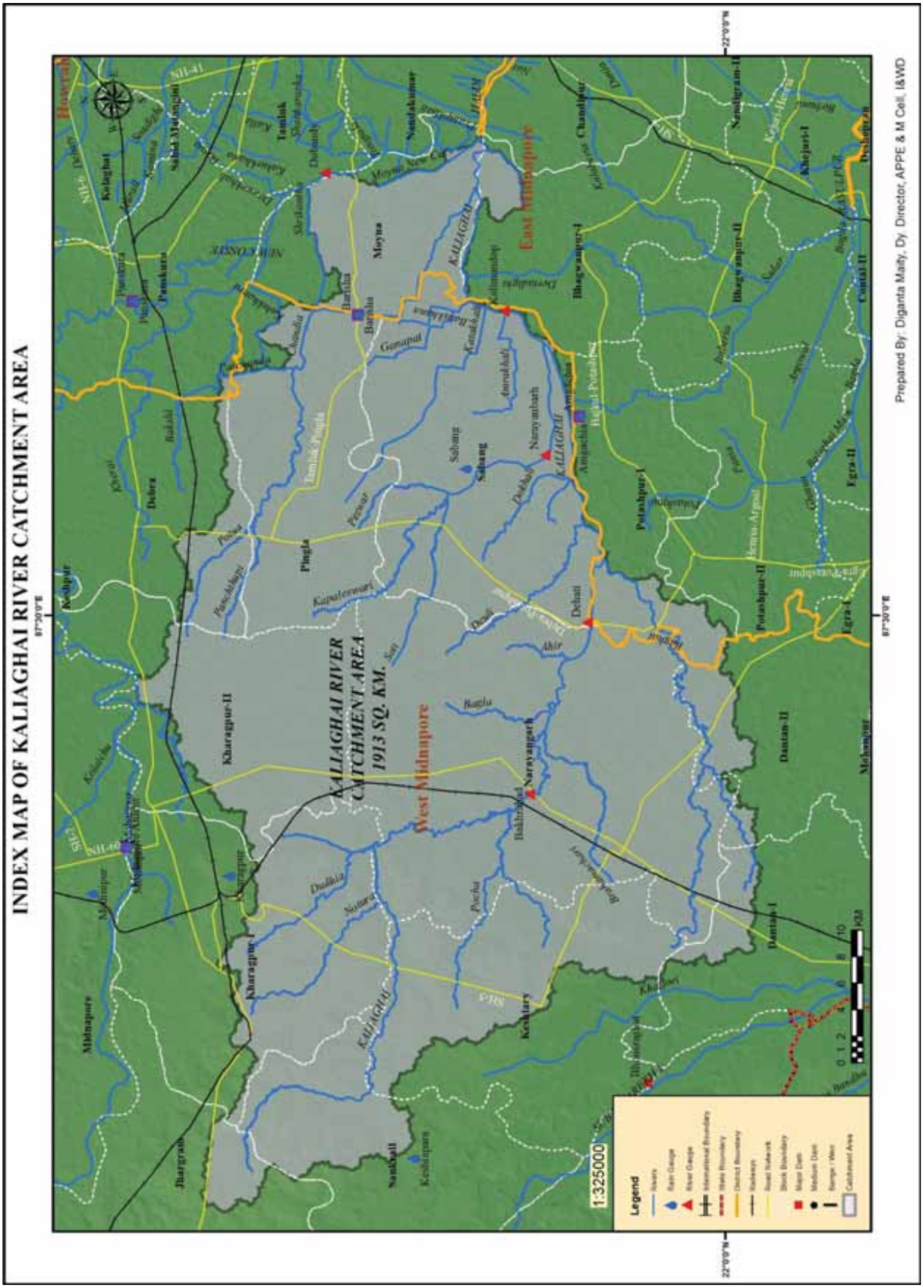

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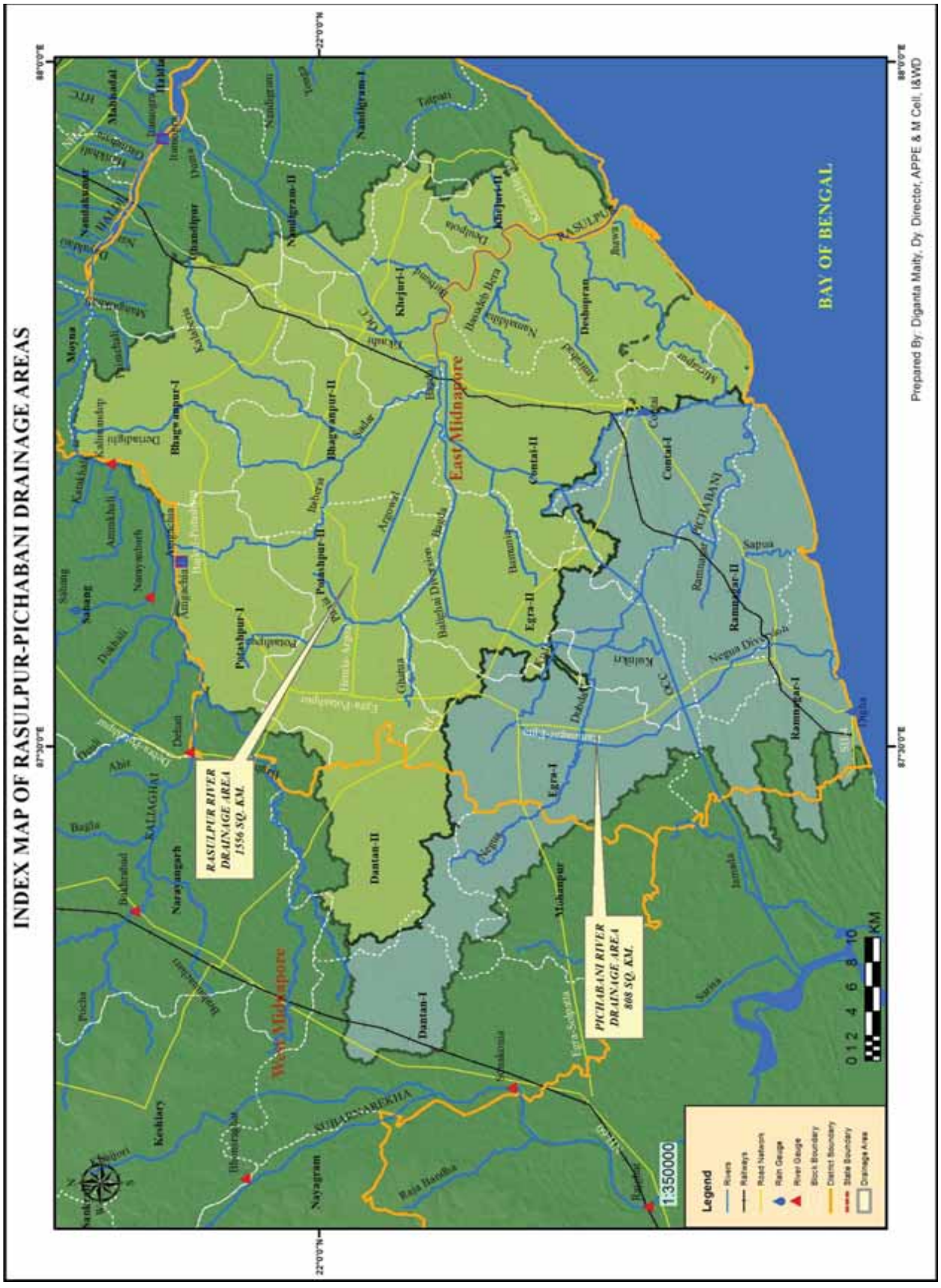

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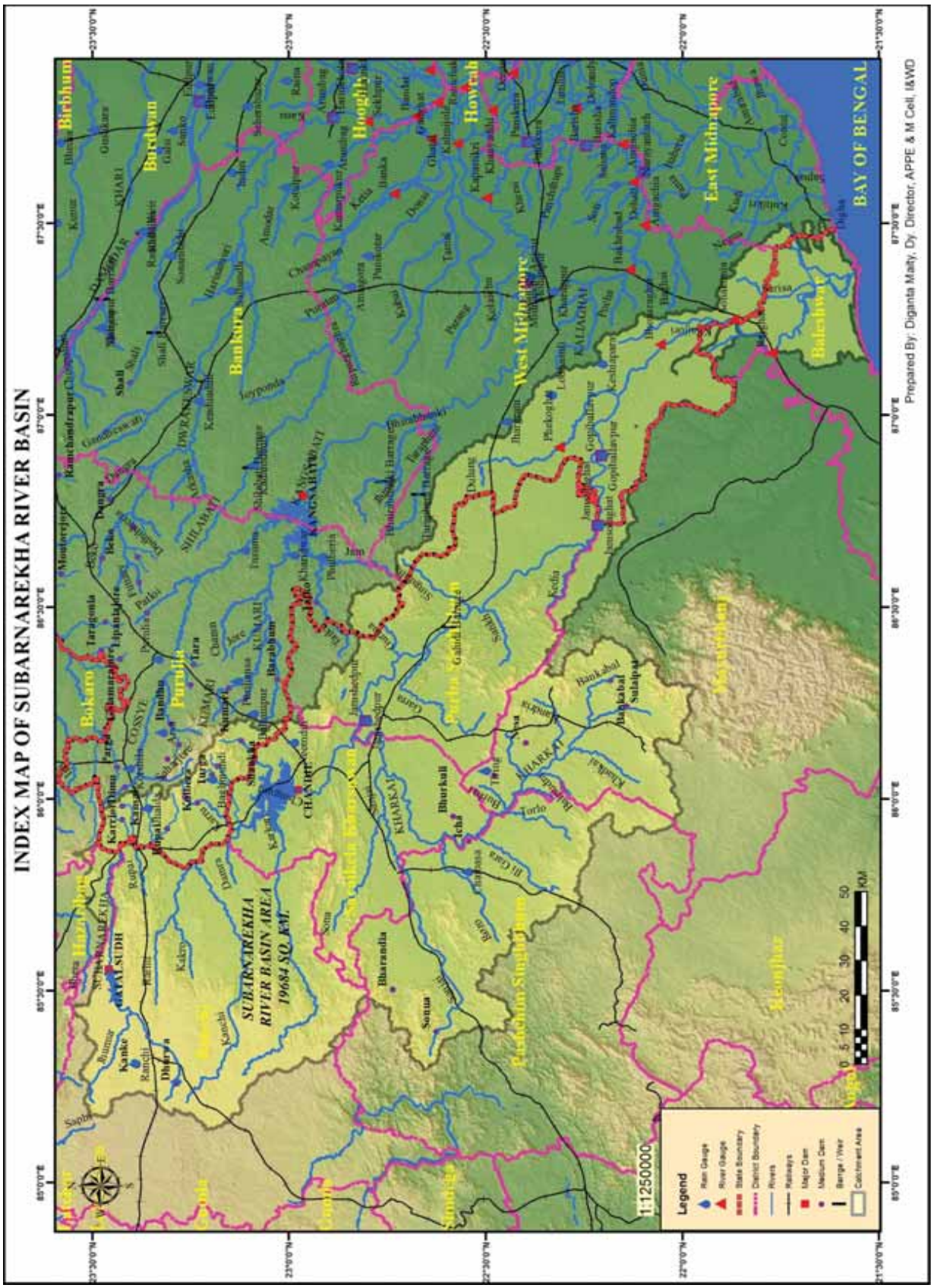


Annexure –III

A) List of Existing Rain Gauge Stations under I. & W. Dept.

Sl. No.	Rain Gauge Station	Type	Name of the River Sub-basin	Districtwise Normal Annual Rainfall in mm.	District	Division under I. & W. Dept., Govt. of W.B.
1	Uttarbhag	ORG	Adi Ganga	2088.0	South 24 parganas	Metropolitan Drainage Mechanical Division.
2	Bahari	ORG	Ajoy	1612.4	Birbhum	Mayurakshi South Canal Division
3	Bhedia	ORG		1315.2	PurbaBardhaman	Damodar Head Works Divn.
4	Debogram	ORG		1612.4	Birbhum	Mayurakshi South Canal Division
5	Nanur	ORG		1612.4	Birbhum	Mayurakshi South Canal Division
6	Satkahania	ORG		1315.2	PaschimBardhaman	Damodar Head Works Divn.
7	Sikatia	ORG		1162.1	Deoghar	Dy. Director (Dist. Plan)
8	Balurghat	ORG	Atrayi	1584.9	DakshinDinajpur	South Dinajpur (I) Division
9	Salar	ORG	Babla	1391.1	Murshidabad	Mayurakshi South Canal Division
10	Kadisala	ORG	Bakreswar	1612.4	Birbhum	Mayurakshi South Canal Division
11	Balgona	ORG	Banka	1315.2	PurbaBardhaman	EE-II, Damador Canal Division
12	Sanko	ORG		1315.2	PurbaBardhaman	EE-I, Damodar Canal Division
13	Paikor	ORG	Bansloi	1612.4	Birbhum	Mayurakshi North Canal Division
14	Berhampur	ORG	Bhagirathi-Hoogly	1391.1	Murshidabad	Berhampur (I) Division
15	Katwa	ORG		1315.2	PurbaBardhaman	EE-II, Damador Canal Division
16	BhairabBanki Barrage	ORG	BhairabBanki	1535.5	Bankura	Kangsabati Canal Division-V
17	Barasat	ARG	Bidyadhari	1560.8	North 24 Parganas	Bidyadhari Drainage Division
18	Chowbhaga	ORG		2088.0	South 24 parganas	Metropolitan Drainage Mechanical Division.
19	Dum Dum	RMC		1560.8	North 24 Parganas	Dy. Director (Dist. Plan)
20	Md.Bazar	ORG	Brahmani	1612.4	Birbhum	Mayurakshi North Canal Division
21	Nalhati	ORG		1612.4	Birbhum	Mayurakshi North Canal Division
22	Barisha	ORG	Chandia	1535.5	PaschimMedinipur	East Midnapur Division
23	Arsa	ORG	Cossye	1363.3	Purulia	Purulia Const. Division
24	Purulia	ORG		1363.3	Purulia	Purulia(I) Division
25	Simulia	ORG		1363.3	Purulia	Bankura Irrigation Divn.
26	Tusuma	ORG		1363.3	Purulia	Bankura Irrigation Divn.
27	Amta	ORG	Damodar	1600.0	Howrah	EE-I, LD Constuction Division
28	Antpur	ORG		1418.7	Hooghly	EE-I L.D.I.Division
29	Asansol	ORG		1315.2	PaschimBardhaman	Damodar Head Works Divn.
30	Champadanga	ORG		1418.7	Hooghly	EE-I L.D.I.Division
31	Durgapur	ORG		1315.2	PaschimBardhaman	Damodar Head Works Divn.
32	Galsi	ORG		1315.2	PurbaBardhaman	Dy. Director (Statistics)
33	Jamalpur	ORG		1418.7	PurbaBardhaman	EE-I L.D.I.Division
34	Khandakosh	ORG		1315.2	PurbaBardhaman	Right Bank (I) Division
35	Lohai(Raina)	ORG		1315.2	PurbaBardhaman	Right Bank (I) Division
36	Maithon	CWC		1355.2	Dhanbad	Dy. Director (Dist. Plan)
37	Maliara	ORG		1340.4	Bankura	Right Bank (I) Division
38	Panchet	CWC		1355.2	Dhanbad	Dy. Director (Dist. Plan)
39	Para	ORG		1363.3	Purulia	Purulia I&P Division
40	Raghunathpur	ORG		1363.3	Purulia	Purulia Const. Division
41	Rondia	ORG		1315.2	PurbaBardhaman	Damodar Head Works Divn.
42	Tenughat	CWC		1247.5	Bokaro	Dy. Director (Dist. Plan)
43	Tilaiya	CWC		1116.2	Koderma	Dy. Director (Dist. Plan)
44	Uchalan			1315.2	Bankura	Righ Ban (I) Division

Sl. No.	Rain Gauge Station	Type	Name of the River Sub-basin	Districtwise Normal Annual Rainfall in mm.	District	Division under I. & W. Dept., Govt. of W.B.
45	Chandrakona	ORG	Donai	1535.5	PaschimMedinipur	Kangsabati Canal Division-I
46	Lodhashuli	ORG	Dulung	1535.5	Jhargram	Kangsabati Canal Division-V
47	Arambag	ORG	Dwarakeswar	1418.7	Hooghly	Hooghly Irrigation Division
48	Bankura	ORG		1330.9	Bankura	Bankura Irrigation Divn.
49	Bowaichandi	ORG		1315.2	PurbaBardhaman	Right Bank (I) Division
50	Indus	ORG		1340.4	Bankura	Right Bank (I) Division
51	Kamarpukur	ORG		1418.7	Hooghly	K.C. Division No.III
52	Kotolpur	ORG		1330.9	Bankura	K.C. Division No.III
53	Salbandh	ORG		1340.4	Bankura	Right Bank (I) Division
54	Deocha Barrage	ORG	Dwarka	1612.4	Birbhum	Mayurakshi North Canal Division
55	Mollarpur	ORG		1612.4	Birbhum	Mayurakshi North Canal Division
56	Rampurhat	ORG		1612.4	Birbhum	Mayurakshi North Canal Division
57	Singur	ORG	Ghea	1418.7	Hooghly	EE-I L.D.I.Division
58	Itamogra	ORG	Haldi	1669.6	PurbaMedinipur	Contai (I) Division
59	Hinglow Dam	ORG	Hinglow	1612.4	Birbhum	Mayurakshi South Canal Division
60	Khayrashole	ORG		1612.4	Birbhum	Mayurakshi South Canal Division
61	Alipore	RMC	Hooghly	1709.2	Kolkata	Dy. Director (Dist. Plan)
62	Bongaon	ORG	Ichamati	1559.8	North 24 Parganas	Bidyadhari Drainage Division
63	Tentulia	ORG		1560.8	North 24 Parganas	Basirhat Irrigation Divn.
64	Swarupganj	ORG	Jalangi	1261.6	Nadia	Nadia (I) Division
65	Banarhat	ORG	Jaldhaka	3463.0	Jalpaiguri	Jalpaiguri (I) Division
66	Mainaguri	ORG		3463.3	Jalpaiguri	Jalpaiguri (I) Division
67	Amgachia	ORG	Kaliaghai	1669.6	PurbaMedinipur	Contai (I) Division
68	Kesiapata	ORG		1535.5	Jhargram	K. Canal Division-V
69	Jhargram	ORG	Kangsabati	1535.5	PaschimMedinipur	K. Canal Division-V
70	Manikpara	ORG		1535.5	Jhargram	K. Canal Division-V
71	Midnapore	ARG		1535.5	PaschimMedinipur	West Midnapur Division
72	Mohanpur	ORG		1535.5	PaschimMedinipur	West Midnapur Division
73	Mukutmanipur	ORG		1330.9	Bankura	Bankura Irrigation Divn.
74	Sabang	ORG	Kapaleswari	1535.5	PaschimMedinipur	Kaliaghai-Kapaleswari-Baghai Project Division
75	Dhaniakhali	ARG	Khari-Behula-Ghea	1418.7	Hooghly	Dy. Director (Dist. Plan)
76	Memari	ORG		1418.7	PurbaBardhaman	EE-I L.D.I.Division
77	Kultore Barrage	ORG	Kopai	1612.4	Birbhum	Mayurakshi South Canal Division
78	Shyambati	ORG		1612.4	Birbhum	Mayurakshi South Canal Division
79	Adalia	ORG	Kubai	1535.5	PaschimMedinipur	K. Canal Division-I
80	Kirnahar	ORG	Kuia	1612.4	Birbhum	Mayurakshi South Canal Division
81	Balarampur	ORG	Kumari	1363.3	Purulia	Purulia(I) Division
82	Kharidwar	ORG		1363.3	Purulia	Bankura Irrigation Divn.
83	Phulberia	ORG		1363.3	Purulia	Bankura Irrigation Divn.
84	Purihansa	ORG		1363.3	Purulia	Bankura Irrigation Divn.
85	Gushkara	ORG	Kunur	1315.2	PurbaBardhaman	Damodar Head Works Divn.
86	English Bazar	ORG	Mahananda	1419.4	Malda	Malda (I) Division
87	Islampur	ORG		1727.6	Uttar Dinajpur	North Dinajpur (I) Division
88	Raiganj	ORG		1727.6	Uttar Dinajpur	North Dinajpur (I) Division
89	Siliguri	ORG		3118.5	Darjeeling	Siliguri (I) Division
90	Malbazar	ORG	Mal	3463.3	Jalpaiguri	Jalpaiguri (I) Division
91	Mathabhanga	ORG	Mansai	3443.7	Coochbehar	Coochbehar (I) Division

Sl. No.	Rain Gauge Station	Type	Name of the River Sub-basin	Districtwise Normal Annual Rainfall in mm.	District	Division under I. & W. Dept., Govt. of W.B.
92	Haripur	ORG	Mayurakshi	1381.5	Dumka	Mayurakshi Headquarter Division
93	Kandi	ORG		1391.1	Murshidabad	Berhampur (I) Division
94	Khushiary	ORG		1381.5	Dumka	Mayurakshi Headquarter Division
95	Maharo	ORG		1381.5	Dumka	Mayurakshi Headquarter Division
96	Massanjore	ORG		1381.5	Dumka	Mayurakshi Headquarter Division
97	Narayanpur	ARG		1391.1	Murshidabad	Berhampur (I) Division
98	Suri	ORG		1381.5	Birbhum	Mayurakshi Headquarter Division
99	Tilpara Barrage	ORG		1612.4	Birbhum	Mayurakshi Headquarter Division
100	Raina	ORG	Mundeswari	1315.2	PurbaBardhaman	Right Bank (I) Division
101	Sehera Bazar	ORG		1330.9	PurbaBardhaman	Right Bank (I) Division
102	Panskura	ORG	New Cossye	1669.6	PurbaMedinipur	East Midnapur Division
103	Gangarampur	ORG	Punarbhaba	1584.9	DakshinDinajpur	South Dinajpur (I) Division
104	Tufanganj	ORG	Raidak-I	3443.7	Coochbehar	Coochbehar (I) Division
105	Contai	CWC	Rasulpur	1669.6	PurbaMedinipur	Contai (I) Division
106	Ghatal	ORG	Rupnarayan	1535.5	PaschimMedinipur	West Midnapur Division
107	Tamluk	ORG		1669.6	PurbaMedinipur	East Midnapur Division
108	Barabisha	CWC	Sankosh	3463.3	Alipurduar	Dy. Director (Dist. Plan)
109	Domjur	ORG	Saraswati	1600.0	Howrah	EE-I, LD Constuction Division
110	Kantabandh	ORG	Shali	1340.4	Bankura	Right Bank (I) Division
111	Sonamukhi	ORG		1330.9	Bankura	Right Bank (I) Division
112	Amlagora	ORG	Shilabati	1535.5	PaschimMedinipur	K. Canal Division-I
113	Panikotar	ORG		1535.5	PaschimMedinipur	K. Canal Division-I
114	Tantloi	ORG	Siddheswari	1381.5	Dumka	Mayurakshi Headquarter Division
115	Baghmundi	ORG	Subarnarekha	1363.3	Purulia	Purulia(I) Division
116	Digha	ORG		1669.6	PurbaMedinipur	Contai (I) Division
117	Gopiballavpur	ORG		1535.5	Jhargram	Jhargram Flood Management & Planning Division
118	Jhalda	ORG		1363.3	Purulia	Purulia(I) Division
119	Sagar Island	AWS	Sundarban Area	2088.0	South 24 parganas	Dy. Director (Dist. Plan)
120	Salboni	ORG	Tamal	1535.5	PaschimMedinipur	K. Canal Division-I
121	Tarapheni Barrage	ORG	Tarapheni	1535.5	Jhargram	K. Canal Division-V
122	Darjeeling	RMC	Teesta	3118.5	Darjeeling	Dy. Director (Dist. Plan)
123	Gangtok	RMC		2739.0	East Sikkim	Dy. Director (Dist. Plan)
124	Jalpaiguri	ORG		3463.3	Jalpaiguri	Jalpaiguri (I) Division
125	Alipurduar	ORG	Torsa	3463.3	Alipurduar	Alipurduar (I) Division
126	Coochbehar	ORG		3443.7	Coochbehar	Coochbehar (I) Division
127	Hasimara	ORG		3463.3	Alipurduar	Alipurduar (I) Division

Annexure –III

B) List of Existing River Gauge Stations under I. & W. Dept.

Sl. No.	River Gauge Station	Name of the River Sub-basin	Danger Level in Metre	Extreme Danger Level in Metre	District	Division under I. & W. Dept., Govt. of W.B.
1	Budra	Ajoy	39.42	40.34	PurbaBardhaman	Damodar Head Works Divn.
2	Gheropara		39.42	40.42	Birbhum	Mayurakshi South Canal Division
3	Katwa		14.48	15.04	PurbaBardhaman	EE-II, Damador Canal Division
4	Amta	Amta Channel	5.64	6.24	Howrah	EE-I, LD Constuction Division
5	Balurghat	Atrayi	23.15	23.76	DakshinDinajpur	South Dinajpur (I) Division
6	Bazarshow	Babla	15.02	15.65	Murshidabad	Mayurakshi South Canal Division
7	Bansloi Rail bridge	Bansloi	31.85	32.76	Birbhum	Mayurakshi North Canal Division
8	Berhampur	Bhagirathi-Hoogly	17.22	17.83	Murshidabad	Berhampur (I) Division
9	Kalna		7.63	8.24	PurbaBardhaman	EE-II, Damador Canal Division
10	Katwa		13.71	14.32	PurbaBardhaman	EE-II, Damador Canal Division
11	Swarupganj		8.44	9.05	Nadia	Nadia (I) Division
12	Jagdhari Road Bridge	Brahmani	33.00	33.40	Birbhum	Mayurakshi North Canal Division
13	Barisha	Chandia	4.55	5.00	PaschimMedinipur	East Midnapur Division
14	Hanskhali	Churni	7.53	8.14	Nadia	Nadia (I) Division
15	Champadanga	Damodar	12.90	13.50	Hooghly	EE-I L.D.I.Division
16	Edilpur		32.79	32.95	PurbaBardhaman	EE-I Damodar canal division
17	Giara		16.16	16.77	Hooghly	EE-I L.D.I.Division
18	Jamalpur		23.24	23.54	PurbaBardhaman	EE-I L.D.I.Division
19	Rondia		52.13	52.89	PurbaBardhaman	Damodar Head Works Divn.
20	Chopra	Dauk	69.46	70.07	Uttar Dinajpur	North Dinajpur (I) Division
21	Chengmari	Diana	200.50	201.20	Jalpaiguri	Jalpaiguri (I) Division
22	Khanyadihi	Durbachati	5.03	5.65	PurbaMedinipur	East Midnapur Division
23	Arambag	Dwarakeswar	17.22	17.83	Hooghly	Hooghly Irrigation Division
24	Bankura		76.50	77.11	Bankura	Bankura Irrigation Divn.
25	patakhola		76.50	77.11	Bankura	Bankura Irrigation Divn.
26	Shakepore		11.75	12.35	Hooghly	Hooghly Irrigation Division
27	Ranagram	Dwarka	17.36	17.86	Murshidabad	Berhampur (I) Division
28	Sankoghat		20.40	21.30	Murshidabad	Berhampur (I) Division
29	Teljana	Fulhar	27.43	28.35	Malda	Malda (I) Division
30	Itahar	Gamari	26.82	27.41	Uttar Dinajpur	North Dinajpur (I) Division
31	Manikchakghat	Ganga	24.69	25.30	Malda	Malda (I) Division
32	Akheriganj	Ganga-Padma	18.44	19.05	Murshidabad	Berhampur (I) Division
33	Geria		20.94	21.55	Murshidabad	Ganga Anti Erosion Division-I
34	Nimtita		21.90	22.51	Murshidabad	Ganga Anti Erosion Division-I
35	Nurpur		21.03	21.64	Murshidabad	Ganga Anti Erosion Division-I
36	Muchighata	Hurhurakhal	6.16	6.77	Howrah	EE-I, LD Constuction Division
37	RD Setu(Bangaon)	Ichamati	4.70	5.25	North 24 Parganas	Bidyadhari Drainage Division
38	Tentulia		5.10	5.40	North 24 Parganas	Basirhat Irrigation Divn.
39	Nagrakata	Jaldhaka	160.70	161.80	Jalpaiguri	Jalpaiguri (I) Division
40	NH 31 Crossing		80.10	80.90	Jalpaiguri	Jalpaiguri (I) Division
41	Gaighata	Jamuna	4.45	5.05	North 24 Parganas	Bidyadhari Drainage Division
42	Gobardanga		4.30	4.90	North 24 Parganas	Bidyadhari Drainage Division
43	Amgachia	Kaliaghai	5.79	6.40	PurbaMedinipur	Contai (I) Division
44	Bhakrabad		8.40	8.85	PaschimMedinipur	Kaliaghai-Kapaleswari-Baghai Project Div.
45	Dehati		6.55	7.00	PaschimMedinipur	Kaliaghai-Kapaleswari-Baghai Project Div.
46	Kalimondop		5.03	5.65	PaschimMedinipur	Kaliaghai-Kapaleswari-Baghai Project Div.
47	Alipurduar	Kaljani	45.10	45.70	Alipurduar	Alipurduar (I) Division

Sl. No.	River Gauge Station	Name of the River Sub-basin	Danger Level in Metre	Extreme Danger Level in Metre	District	Division under I. & W. Dept., Govt. of W.B.
48	Mohanpur	Kangsabati	25.75	26.36	PaschimMedinipur	West Midnapur Division
49	Narayanbarh	Kapaleswari	5.33	5.94	PaschimMedinipur	Kaliaghai-Kapaleswari-Baghai Project Div.
50	Angarpur	Kuia	19.05	20.05	Murshidabad	Mayurakshi South Canal Division
51	Tarapur		22.71	23.35	Murshidabad	Berhampur (I) Division
52	Railway Bridge	Kullick	31.20	32.69	Uttar Dinajpur	North Dinajpur (I) Division
53	English Bazar	Mahananda	21.00	21.75	Malda	Malda (I) Division
54	Hill Curt Road		115.98	116.59	Darjeeling	Siliguri (I) Division
55	Sonapur		75.77	76.38	Uttar Dinajpur	North Dinajpur (I) Division
56	Mathabhanga	Mansai	47.70	48.20	Coochbehar	Coochbehar (I) Division
57	Majdia	Mathabhanga	7.82	8.43	Nadia	Nadia (I) Division
58	Narayanpur	Mayurakshi	27.99	28.79	Murshidabad	Berhampur (I) Division
59	Makdampur	Nagar	31.54	31.86	Uttar Dinajpur	North Dinajpur (I) Division
60	Dobandi	New Cossye	5.02	5.63	PurbaMedinipur	East Midnapur Division
61	Panskura		9.29	9.90	PurbaMedinipur	East Midnapur Division
62	Kalmijole	Old Cossye	9.29	9.90	PaschimMedinipur	West Midnapur Division
63	Gangarampur	Punarbhaba	25.82	26.42	DakshinDinajpur	South Dinajpur (I) Division
64	LRP Crossing	Raidak-I	47.00	47.90	Alipurduar	Alipurduar (I) Division
65	Tufanganj		35.30	35.90	Coochbehar	Coochbehar (I) Division
66	LRP Crossing	Raidak-II	48.40	49.30	Alipurduar	Alipurduar (I) Division
67	Bandar	Rupnarayan	6.85	7.46	PaschimMedinipur	West Midnapur Division
68	Denan		4.42	5.02	PurbaMedinipur	East Midnapur Division
69	Gopiganj		5.03	5.65	PaschimMedinipur	West Midnapur Division
70	Ranichak		5.33	5.94	PaschimMedinipur	West Midnapur Division
71	LRP Crossing	Sankosh	48.50	49.40	Alipurduar	Alipurduar (I) Division
72	Banka	Shilabati	15.08	15.69	PaschimMedinipur	West Midnapur Division
73	Gadghat		8.99	9.60	PaschimMedinipur	West Midnapur Division
74	Gopiballavpur	Subarnarekha	45.50	46.50	Jhargram	Jhargram Flood Management & Planning Div.
75	Sonakonia		16.15	16.75	PaschimMedinipur	Contai (I) Division
76	Kachua	Sui	25.49	26.09	Uttar Dinajpur	North Dinajpur (I) Division
77	Pajol		27.43	28.00	Uttar Dinajpur	North Dinajpur (I) Division
78	Bansihari	Tangon	25.60	26.21	DakshinDinajpur	South Dinajpur (I) Division
79	Radhikapur		33.45	34.05	Uttar Dinajpur	North Dinajpur (I) Division
80	Coronation Bridge	Teesta	150.00	153.60	Darjeeling	Jalpaiguri (I) Division
81	Domohani		85.95	86.30	Jalpaiguri	Jalpaiguri (I) Division
82	Mekhliganj		150.00	153.00	Coochbehar	Jalpaiguri (I) Division
83	Teesta Bazar		211.00	213.00	Darjeeling	Jalpaiguri (I) Division
84	Coochbehar	Torsa	42.07	42.68	Coochbehar	Coochbehar (I) Division
85	Hasimara		116.30	117.50	Alipurduar	Alipurduar (I) Division

Annexure –III

C) List of Existing Dam Barrage Monitoring Stations under I. & W. Dept.

Sl. No.	Dam / Barrage	Name of the River Sub-basin	Conservation Level in ft.	Maximum Flood Level in ft.	District	Division
1	Chandil Dam	Subarnarekha	630.00	630.00	Kolkata	Dy. Director (Dist. Plan)
2	Durgapur Barrage	Damodar	211.50	211.50	PaschimBardhaman	Damodar Head Works Divn.
3	Ex-Galudih Barrage	Subarnarekha	302.00	332.00	Kolkata	Dy. Director (Dist. Plan)
4	Hinglow Dam	Hinglow	321.00	324.00	Birbhum	Mayurakshi South Canal Division
5	Mahananda Barrage	Mahananda	352.00	352.00	Darjeeling	Mahananda Barrage Division
6	Maithon Dam	Damodar	480.00	495.00	PaschimBardhaman	Damodar Head Works Divn.
7	Massanjore Dam	Mayurakshi	398.00	398.00	Birbhum	Mayurakshi Headquarter Division
8	Mukutmonipur Dam	Kangsabati	434.00	440.00	Bankura	K.C. Division No.-II
9	Panchet Dam	Damodar	410.00	425.00	PaschimBardhaman	Damodar Head Works Divn.
10	Sikatia Barrage	Ajay	558.00	559.70	Kolkata	Dy. Director (Dist. Plan)
11	Teesta Barrage	Teesta	375.00	378.30	Jalpaiguri	Teesta Barrage Division
12	Tenughat Dam	Damodar	852.00	864.00	PaschimBardhaman	Damodar Head Works Divn.
13	Tilpara Barrage	Mayurakshi	206.00	206.00	Birbhum	Mayurakshi Headquarter Division

D) List of Existing River Gauge Discharge Stations under I. & W. Dept.

Sl. No.	River Gauge Discharge Station	Name of the River Sub-basin	Danger Level in Metre	Extreme Danger Level in Metre	District	Division
1	Amuliaghat	Ajoy	104.73	105.33	PurbaBardhaman	BurdwanInv& Planning Division
2	Amta	Amta Channel	5.64	6.24	Howrah	Executive Engineer-I, I.& P. Division.(S)
3	Champadanga	Damodar	12.90	13.50	Hooghly	Executive Engineer-I, I.& P. Division.(S)
4	Kapastikri	Kangsabati	16.00	16.60	Nadia	Dy. Director (Statistics)
5	Englishbazar	Mahananda	21.00	21.75	Malda	Malda (I) Division
6	Harinkhola	Mundeswari	12.80	13.41	PaschimMedinipur	Executive Engineer-I, I.& P. Division.(S)

Annexure IV: DistrictwiseMonthly Rainfall Statistics of West Bengal for the Year 2018

Month	January			Febuary			March			April		
Rainfall in mm	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**
District												
Coochbehar	0	8.9	-100	2.6	16	-84	35.3	32.2	10	130.2	138.9	-6
Darjeeling	0.7	48.3	-99	6	33.8	-82	40.4	57.7	-30	79.9	130.5	-39
Jalpaiguri	0.1	9.2	-99	1	17.8	-94	47.2	39.7	19	140	119.3	17
Malda	0	13.6	-100	7.6	10.5	-28	22.9	14.5	58	112	34.8	222
North Dinajpur	0	21.5	-100	0	2	-100	13.5	8	68	71.2	35.7	99
South Dinajpur	0	8.9	-100	8	13.3	-40	9.4	19	-51	30.9	58.9	-47.5
North Bengal Total	**0.8**	**110.4**	**-99.3%**	**25.2**	**93.4**	**-73.0%**	**168.7**	**171.1**	**-1.4%**	**564.2**	**518.1**	**8.9%**
Bankura	0	12	-100	0.1	18	-99	9.1	22	-59	149.6	36.3	312
Birbhum	0	13.4	-100	0.5	16.1	-97	0.8	21.2	-96	51.5	30.9	67
Burdwan	0	10.7	-100	0.1	22.2	-99	15.1	19.8	-24	82.6	37.8	118
East Midnapore	0	15.9	-100	1.1	18.6	-94	1	31.8	-97	66.4	34.7	91
Hooghly	0	11.9	-100	0.3	26.6	-99	5.7	28.2	-80	70.4	50.6	39
Howrah	0	12.2	-100	0.1	24.9	-99	3.4	32	-89	57.5	52.6	9
Kolkata	0	14.4	-100	0	24.7	-100	0	33.5	-100	113.7	53.1	114
Murshidabad	0	16.8	-100	16.1	11.2	44	2.9	19	-85	54.3	34	60
Nadia	0	12.2	-100	3.6	17.6	-79	0.6	21.1	-97	66.4	42.1	58
North 24 Parganas	0	15.6	-100	0	17.8	-100	2.4	30.3	-92	85.7	51.5	66
Puraulia	0	14.3	-100	0.5	20.7	-98	3.3	24.6	-87	76.5	36.1	112
South 24 Parganas	0	13.6	-100	0.4	26.7	-99	0.4	37.9	-99	44.2	41.7	6
West Midnapore	0	12.2	-100	3.4	24.1	-86	1.6	39	-96	99.1	56.8	74
South Bengal Total	**0**	**175.2**	**-100.0%**	**26.2**	**269.2**	**-90.3%**	**46.3**	**360.4**	**-87.2%**	**1017.9**	**558.2**	**82.4%**

*Source: IMD

Annexure IV: DistrictwiseMonthly Rainfall Statistics of West Bengal for the Year 2018

Month	May			June			July			August		
Rainfall in mm	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**
District												
Coochbehar	327.9	345.4	-5	3334.2	668.8	-50	359.1	864.9	-58	351.5	733	-52
Darjeeling	241.9	262.3	-8	365.8	594.7	-32	542.9	756.9	-28	558.7	645.9	-14
Jalpaiguri	448.5	339.3	32	661.5	667.3	-1	743	931.4	-20	571.7	670.9	-15
Malda	153.6	106.2	45	85.3	216.6	-61	230.2	332.9	-31	148.9	284.8	-48
North Dinajpur	180.5	162.9	11	134.4	316	-57	274.3	367	-25	293.9	307.7	-5
South Dinajpur	138.8	167.8	-17	109.6	289.3	-62	208	368.9	-44	108.3	248	-56
North Bengal Total	**1491.2**	**1383.9**	**7.8%**	**4690.8**	**2752.7**	**70.4%**	**2357.5**	**3622**	**-34.9%**	**2033**	**2890.3**	**-29.7%**
Bankura	76.5	66.9	14	216.1	215	0	318.9	303.2	5	315.4	290.7	9
Birbhum	62.6	78.7	-20	127.4	222.3	-43	250.9	313.9	-20	159.7	298.8	-47
Burdwan	43.5	78.8	-45	157.6	198.2	-20	320.7	294.1	9	174.7	285.3	-39
East Midnapore	114.3	108.1	6	221	253.5	-13	339.6	284.9	19	263.5	338.7	-22
Hooghly	54.7	108.5	-50	120.1	243.4	-51	321.9	316.1	2	195	265.1	-26
Howrah	56.4	126.4	-55	161.4	253.2	-31	278	343.2	-18	217.4	329.4	-34
Kolkata	64	113.4	-44	419.7	278.3	51	307.9	361	-15	268.7	335.2	-20
Murshidabad	94.9	87	9	127.5	237.6	-46	179.6	328.6	-45	120.4	256.9	-53
Nadia	87.3	95.2	-8	137.4	234.1	-41	292.1	270.8	8	188.4	236	-20
North 24 Parganas	162.9	113.4	44	245.4	271.9	-10	384.3	317.2	21	259.8	304.3	-15
Puraulia	73.3	57.3	28	198.7	222.1	-11	268.9	298.7	-10	233.9	307	-24
South 24 Parganas	95.9	125.1	-23	369.3	316	17	455.9	463.6	-2	257.9	416.2	-38
West Midnapore	109.3	107.6	2	180.1	243.8	-26	256.3	329.5	-22	300.9	316	-5
South Bengal Total	**1095.6**	**1266.4**	**-13.5%**	**2681.7**	**3189.4**	**-15.9%**	**3975**	**4224.8**	**-5.9%**	**2955.7**	**3979.6**	**-25.7%**

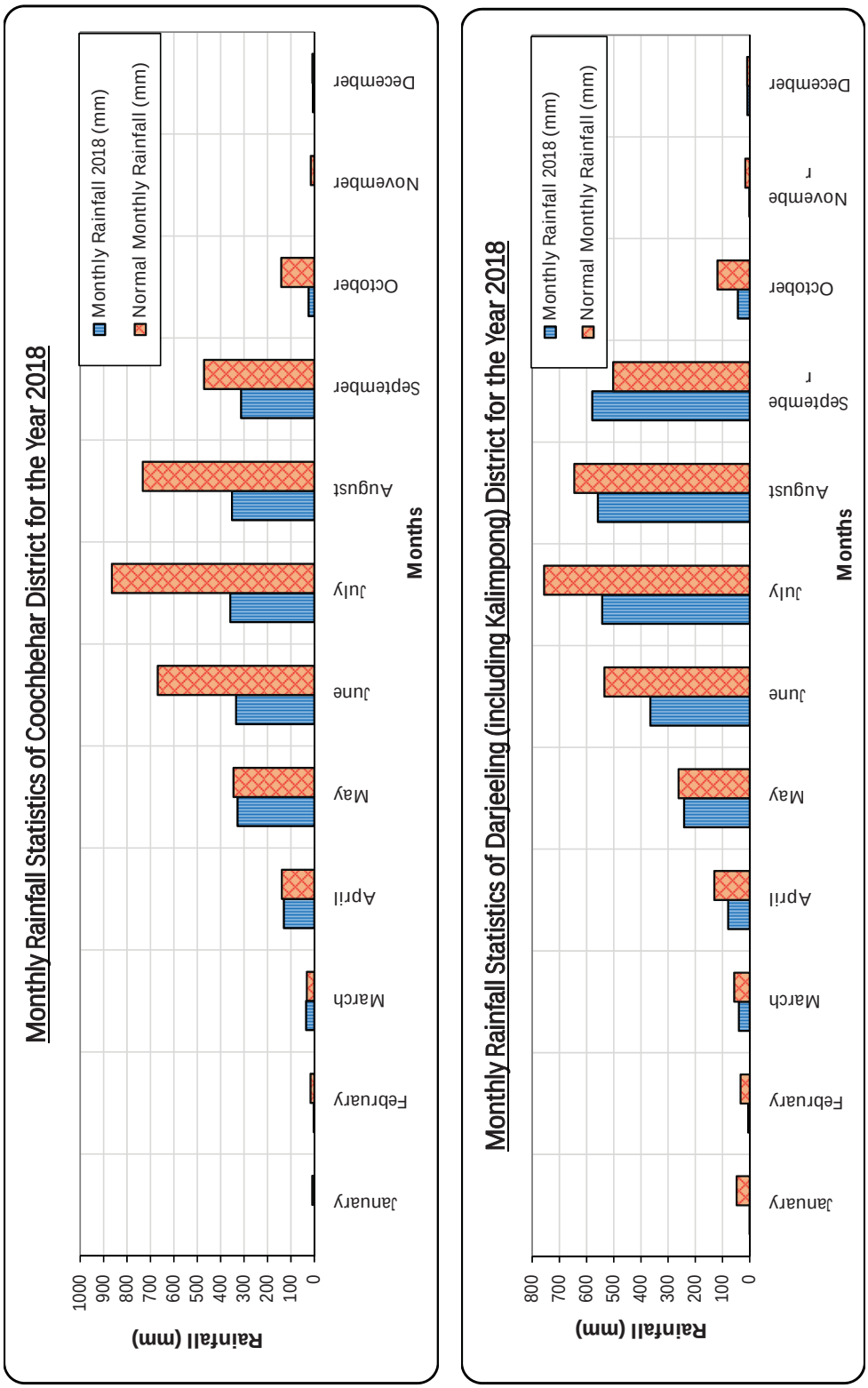
*Source: IMD

Annexure IV: DistrictwiseMonthly Rainfall Statistics of West Bengal for the Year 2018

Month	September			October			November			December		
Rainfall in mm	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**	**Actual**	**Normal**	**% Dep**
District												
Coochbehar	313	470.9	-34	24.7	141.3	-83	0	15.1	-100	6.3	8.3	-24
Darjeeling	579.7	502.8	15	43.9	118.9	-63	0.9	16.8	-95	8.9	9.9	-24
Jalpaiguri	799.9	488.3	64	91	159.9	-43	3.1	18	-83	4.6	7.2	-36
Malda	133.4	283	-53	59.5	102.5	-42	0	13.2	-100	12.9	6.8	90
North Dinajpur	184.3	403.8	-54	16.3	90.7	-82	0	9.1	-100	9	3.2	181
South Dinajpur	103.2	279.7	-63	17.7	112.5	-84	0	13	-100	0	5.6	-100
North Bengal Total	**2113.5**	**2428.5**	**-13.0%**	**253.1**	**725.8**	**-65.1%**	**4**	**85.2**	**-95.3%**	**41.7**	**41**	**1.7%**
Bankura	151	242.3	-38	32.7	105.2	-69	1	9.8	-90	47.7	9.5	402
Birbhum	170	271	-37	36.6	105.1	-65	0	15.8	-100	25	5.6	346
Burdwan	154.3	251.1	-39	15.1	99.8	-85	0	11.4	-100	25.4	6	324
East Midnapore	377.3	343.2	10	224.6	196.9	14	12.6	34	-63	6.9	9.3	-26
Hooghly	148.7	243.3	-39	19.6	102.1	-81	0.1	16	-99	20.3	6.9	194
Howrah	203.6	305.6	-33	23.4	99.1	-76	1	31.3	-97	11	10.1	9
Kolkata	221.5	306.6	-28	56.6	155.3	-64	5.6	24.8	-77	9.3	8.9	4
Murshidabad	99.6	256.2	-61	78	126.3	-38	0	11	-100	24	6.5	269
Nadia	96.9	214.1	-55	25.2	100.2	-75	4.3	10.4	-59	28.1	7.8	260
North 24 Parganas	169.7	279.4	-39	70.7	130.9	-46	0	21.8	-100	13.2	5.7	132
Puraulia	175.4	266.7	-34	46.9	91.5	-49	0	16.7	-100	49.2	7.6	548
South 24 Parganas	181.3	356.8	-49	105.8	218.4	-52	11.1	62.3	-82	12.7	9.7	31
West Midnapore	229.6	276.8	-17	71.9	106.5	-32	12.8	17.9	-28	27	5.3	409
South Bengal Total	**2378.9**	**3613.1**	**-34.2%**	**807.1**	**1637.3**	**-50.7%**	**48.5**	**283.2**	**-82.9%**	**299.8**	**98.9**	**203.1%**

*Source: IMD

Annexure V: Graphical Representation ofMonthly Rainfall Statistics of West Bengal for the Year 2018



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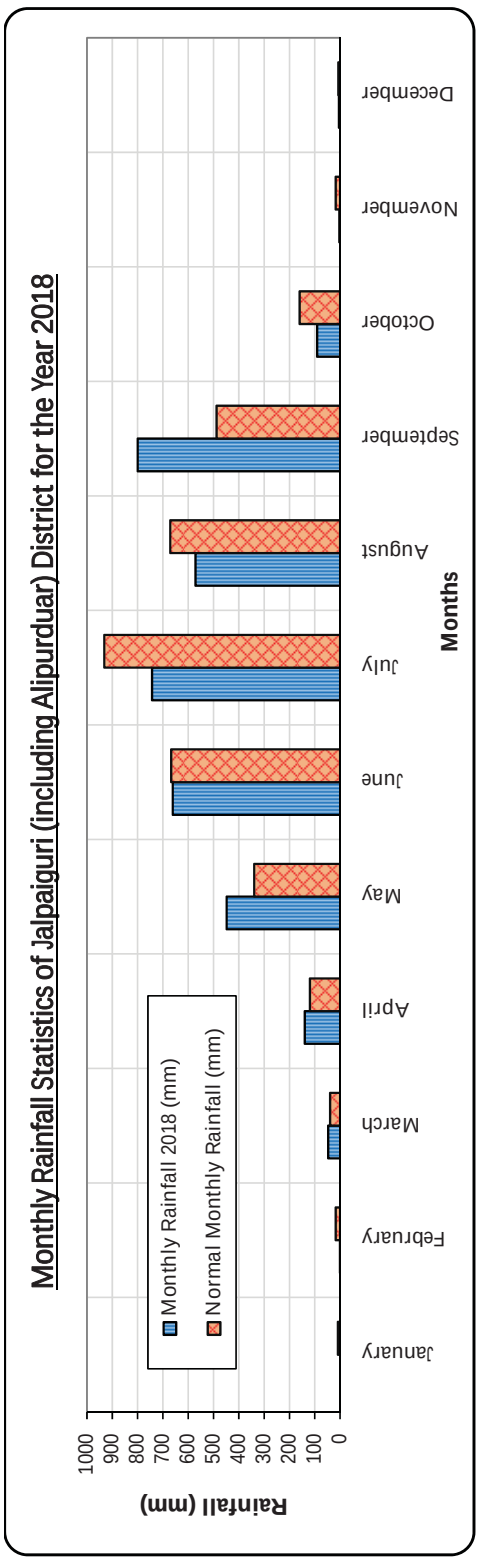

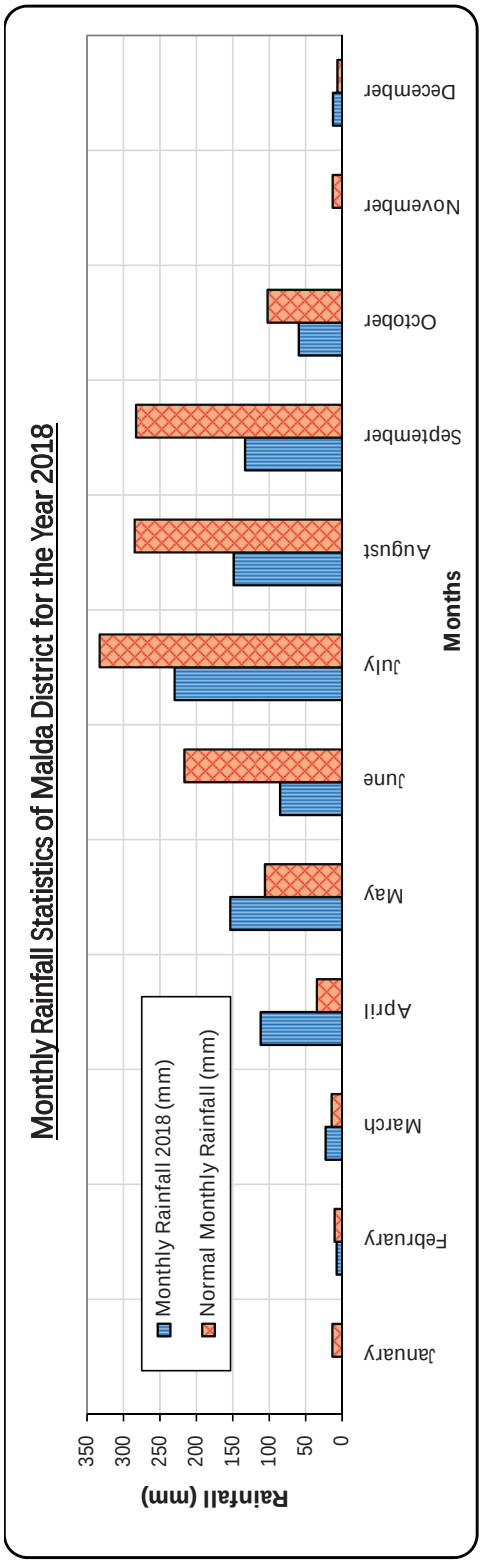

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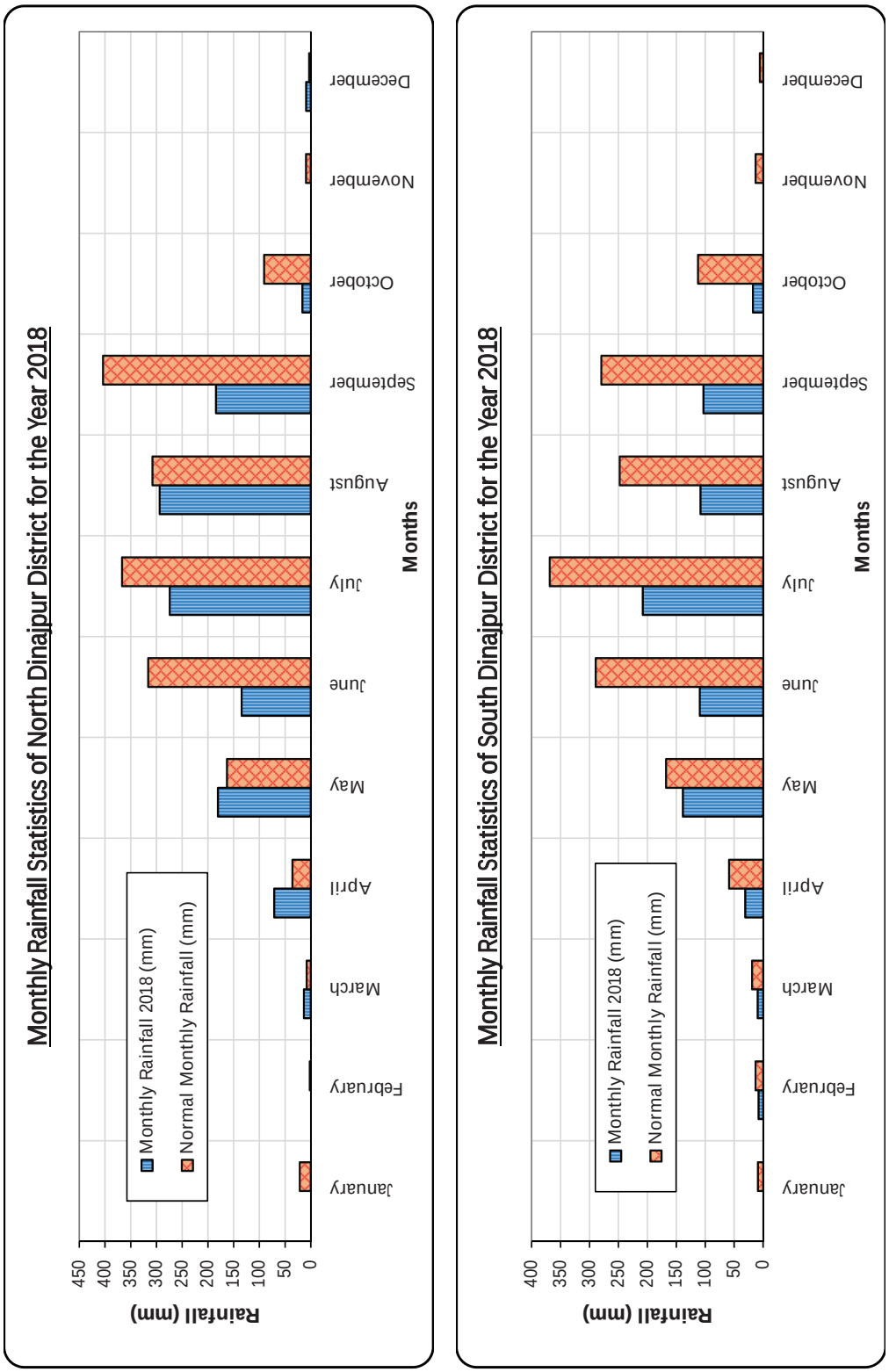

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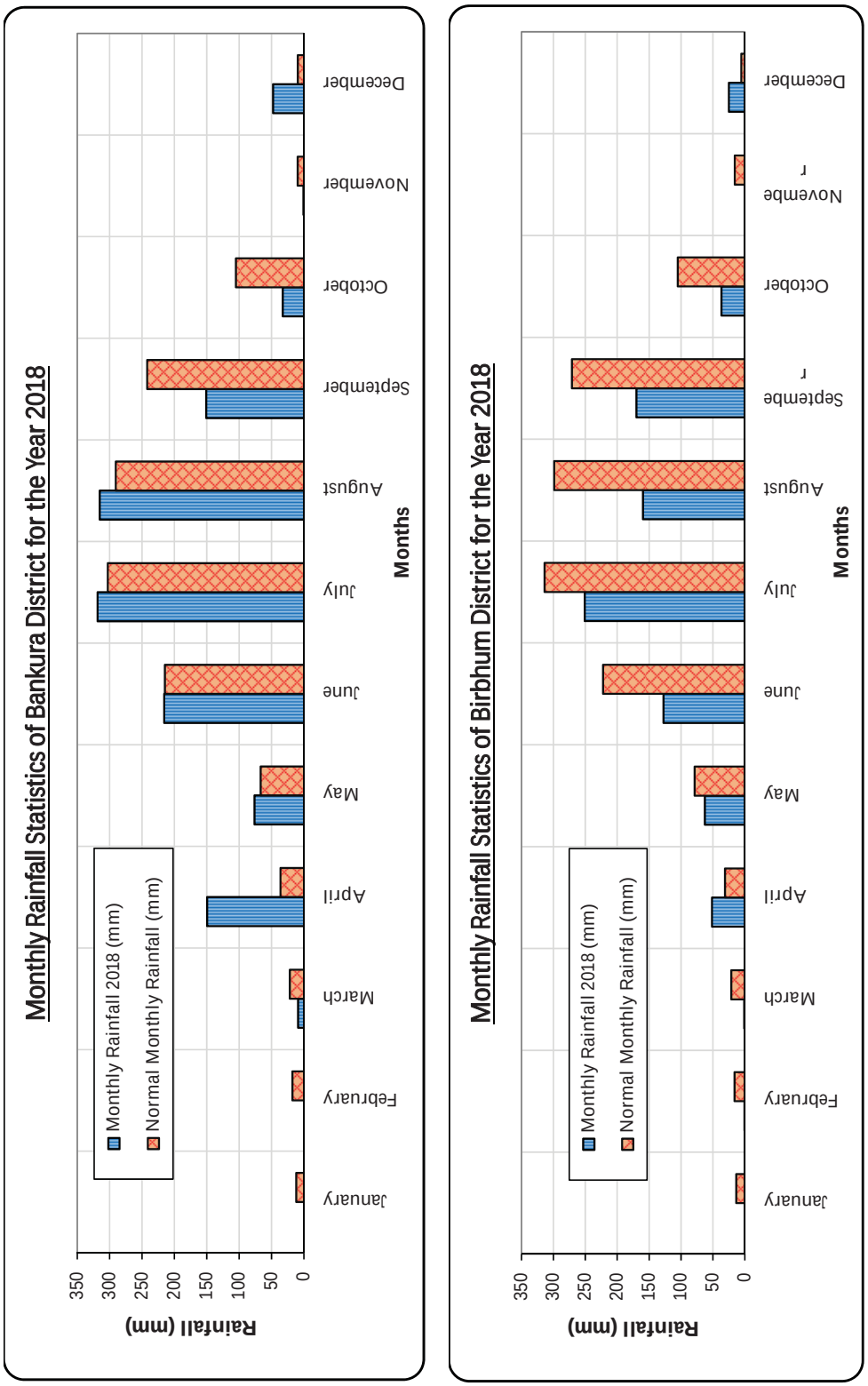

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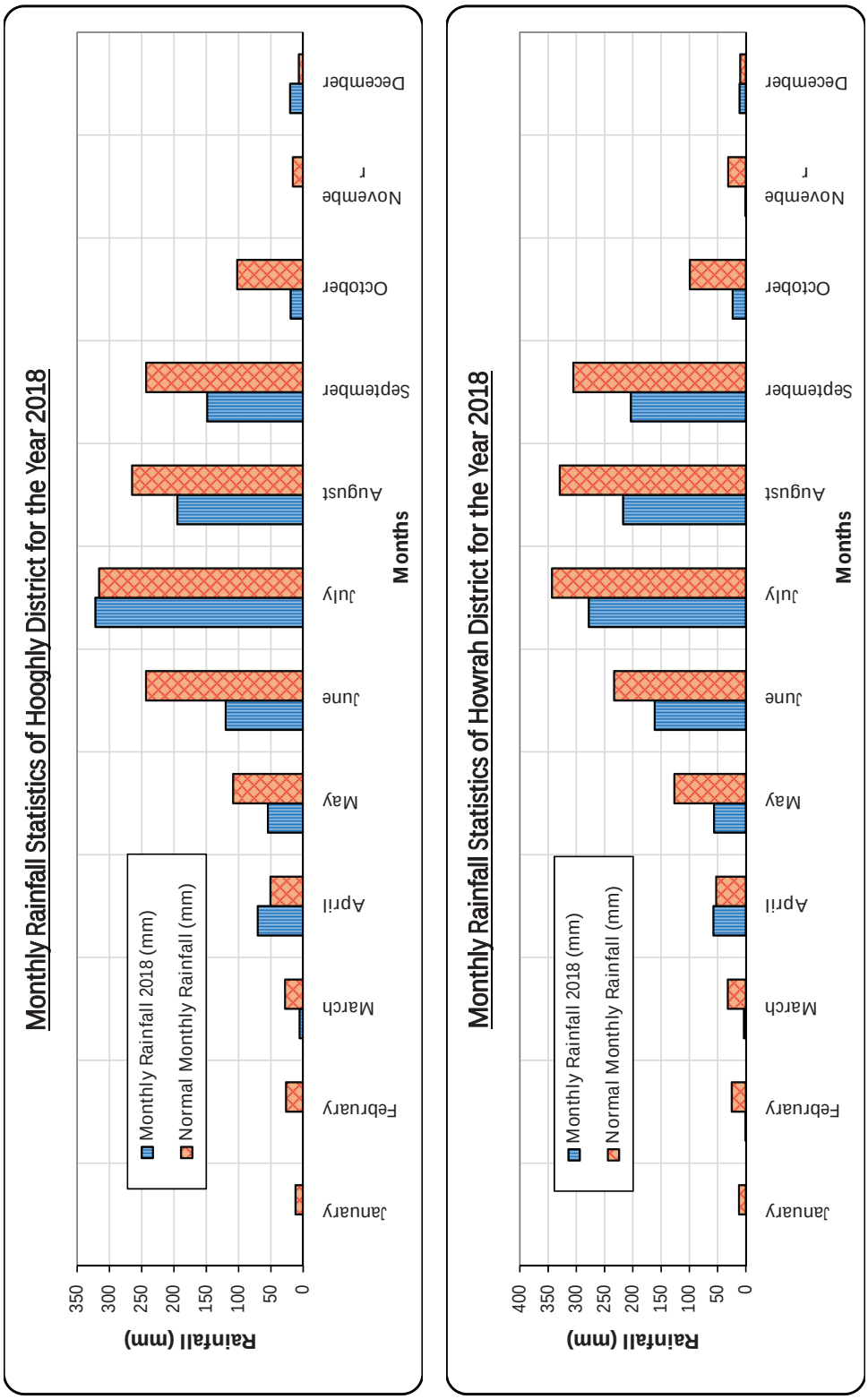

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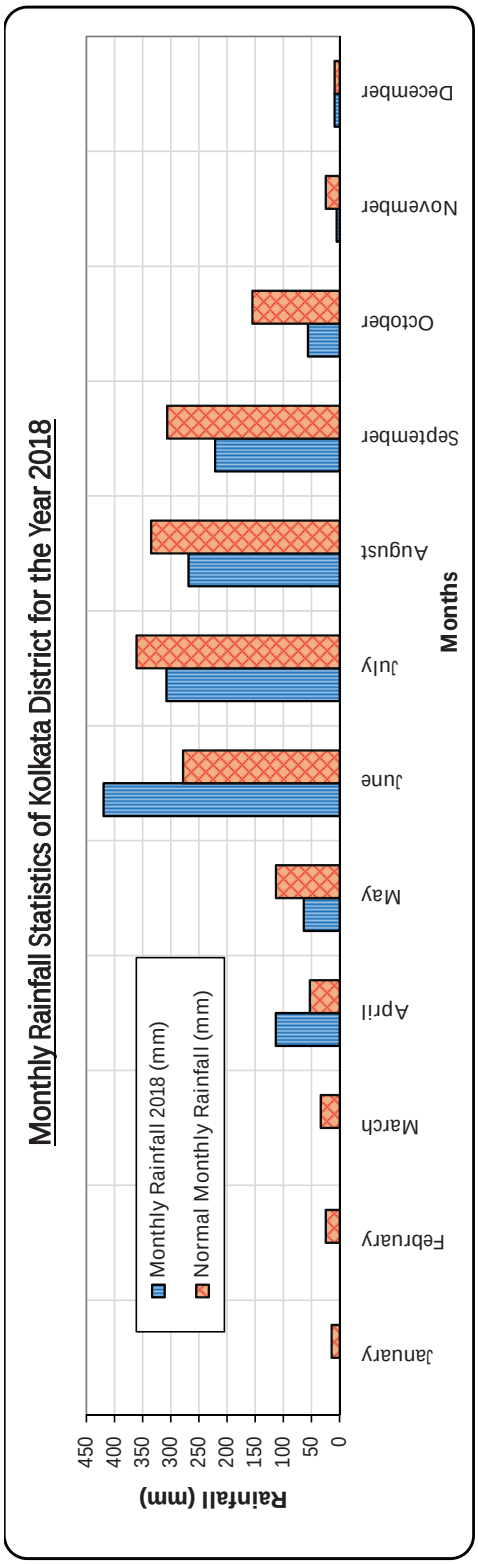

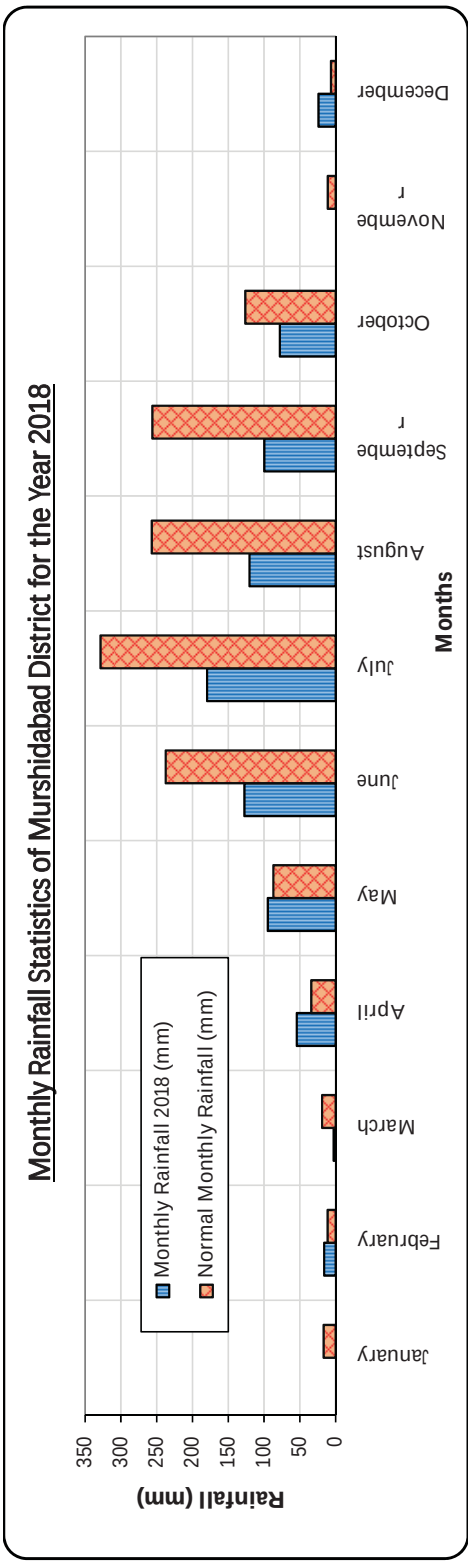

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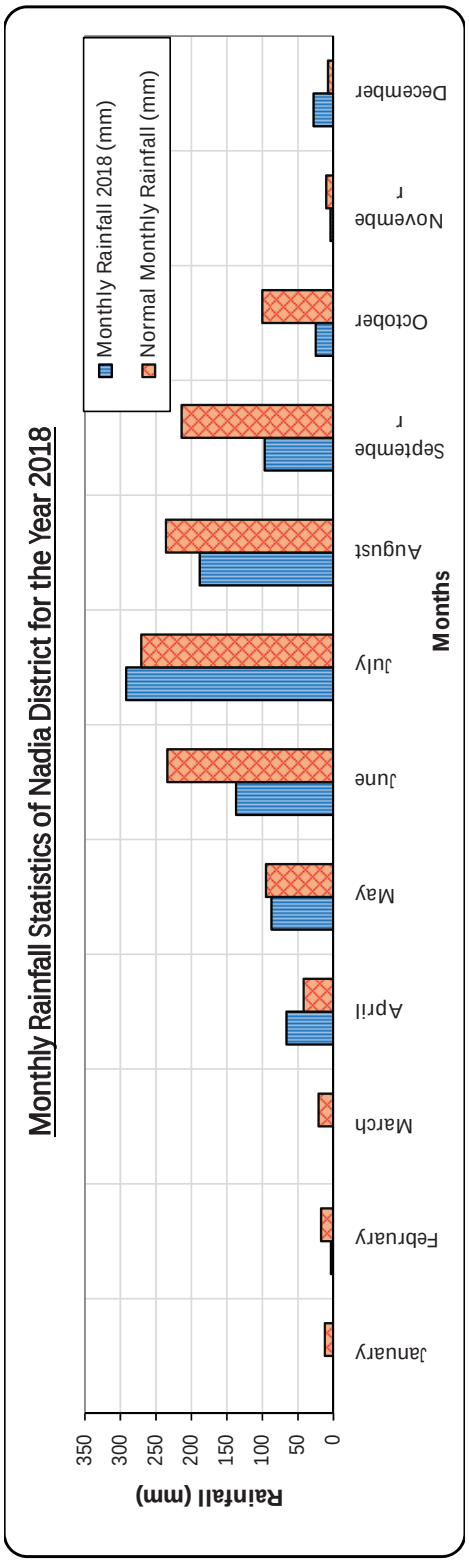

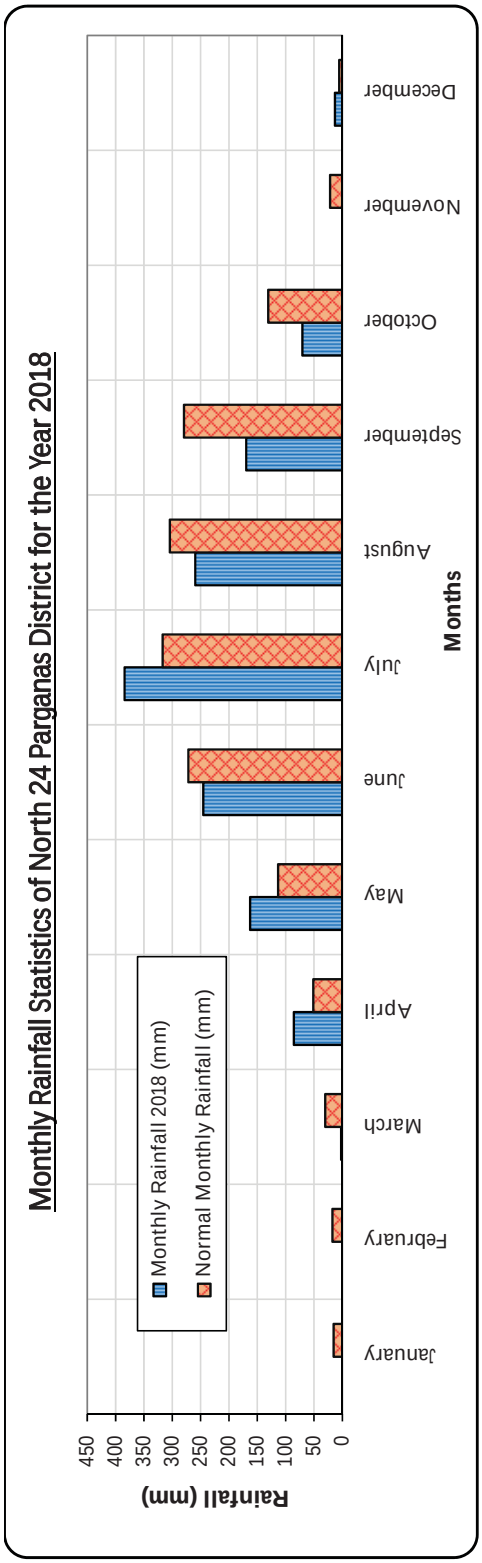

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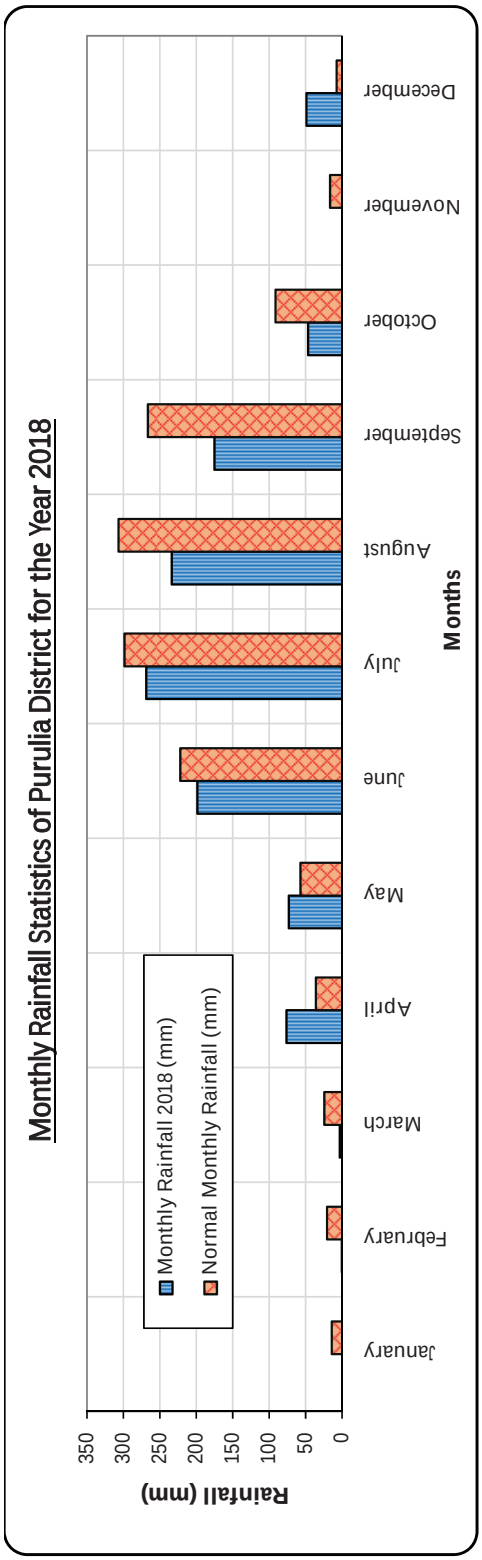

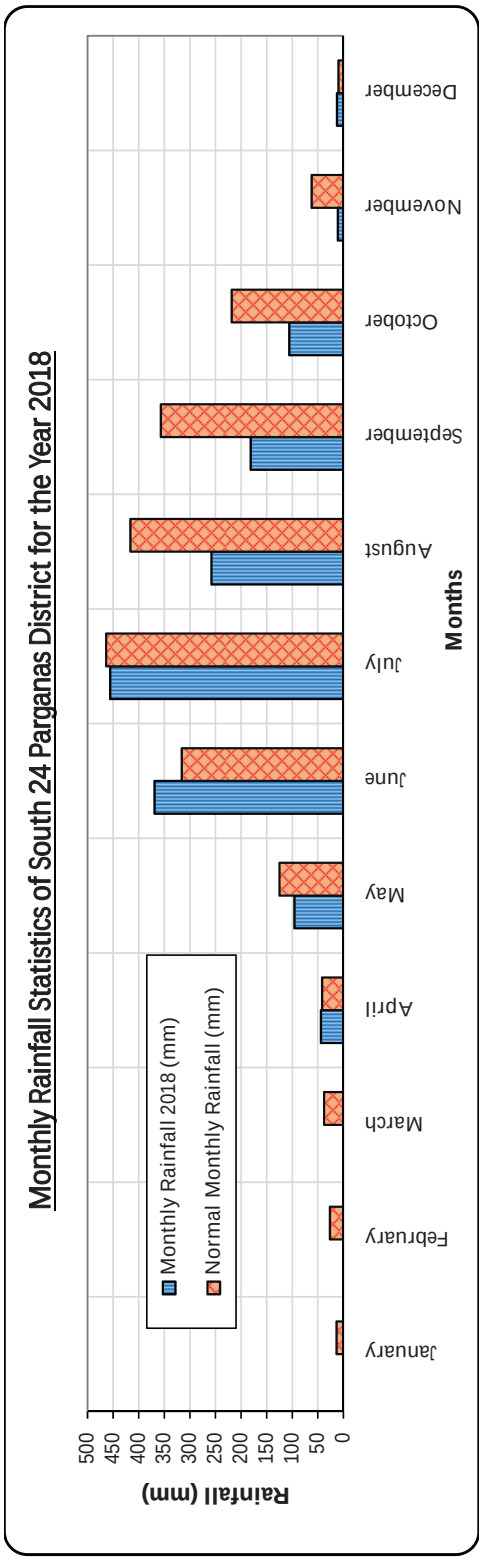

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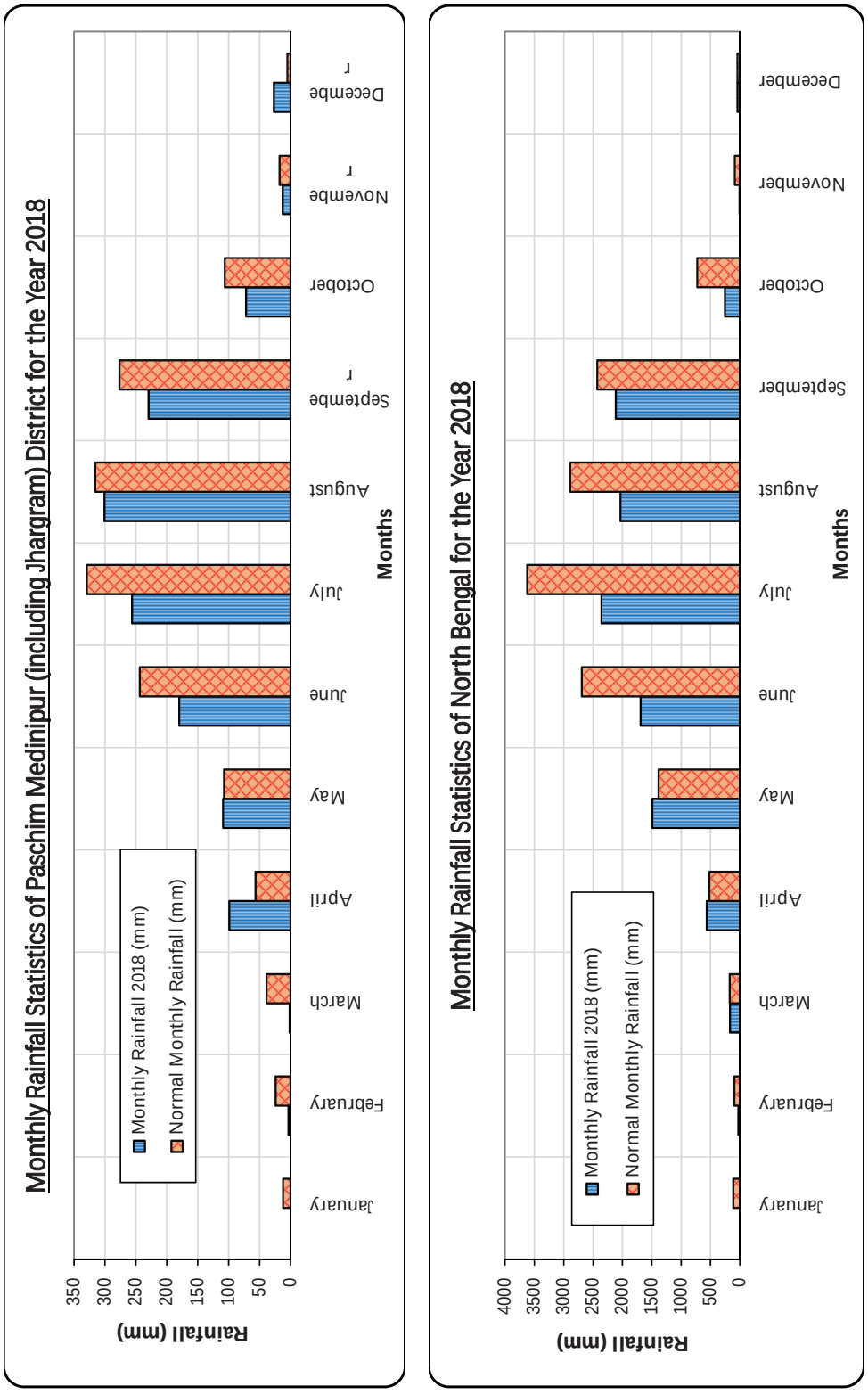
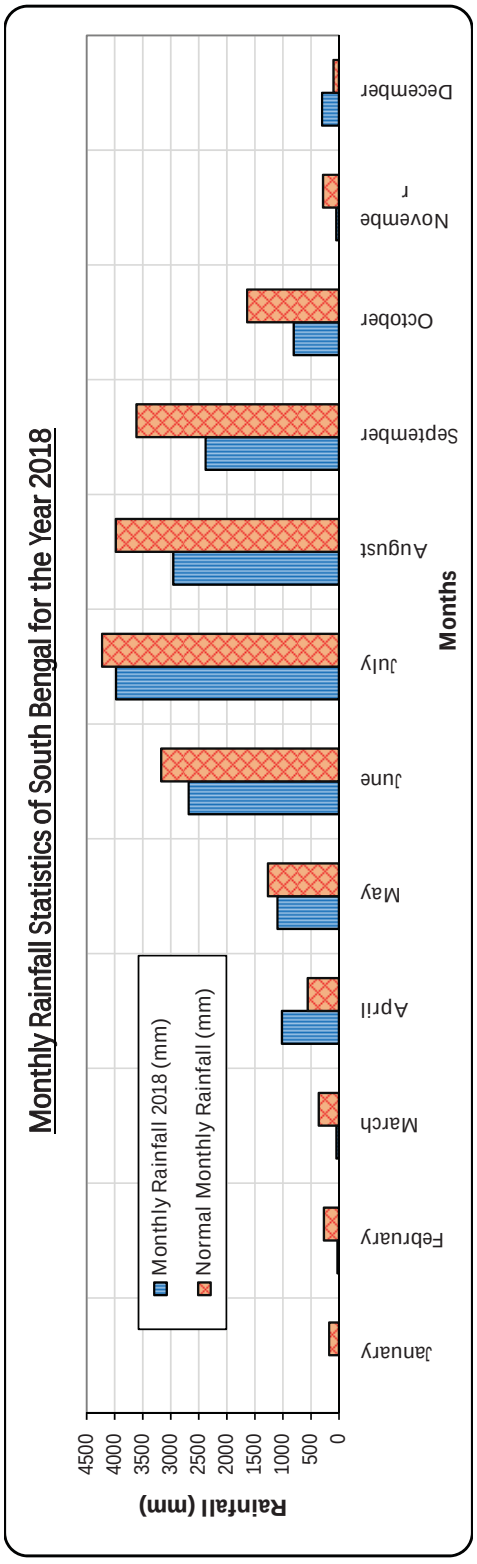
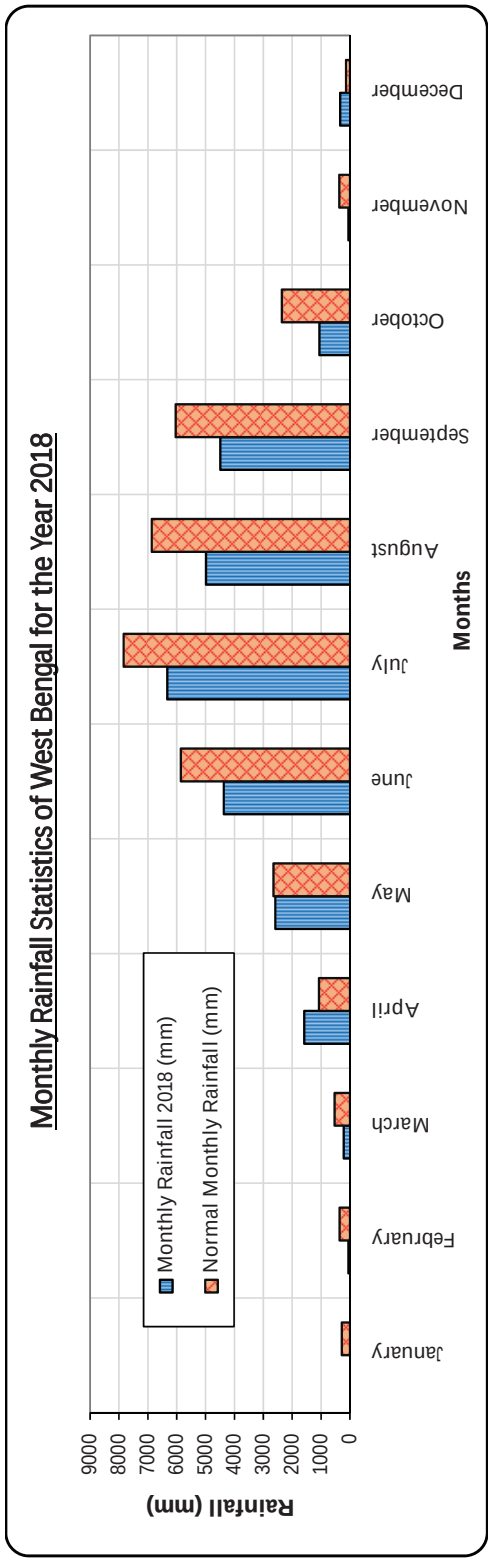


Annexure V: Graphical Representation of District-wise Monthly Rainfall Statistics of West Bengal for the Year 2018



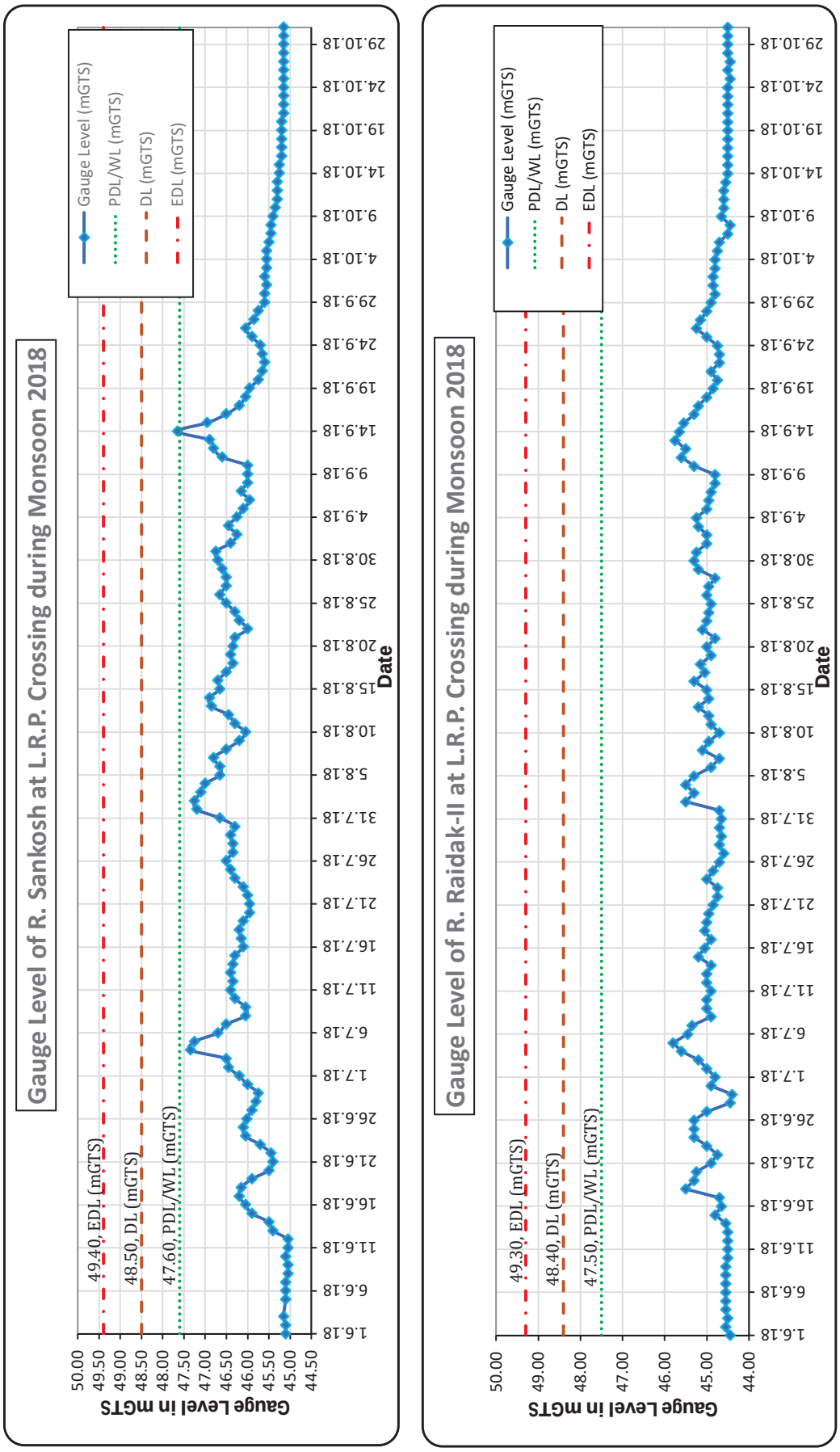


Annexure VI: Station-wise Monthly Rainfall Statistics during Monsoon, 2018

Sl	RIVER BASIN	Location of Rain Gauge Station	District	District wise Normal Annual Rainfall (mm)	Station wise Monthly Rainfall (mm)					Stn-wise Cum. Rainfall (mm)
					Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	
1	Teesta	Gangtok	East Sikkim	2739.00	526.20	608.00	704.10	357.90	86.10	2282.30
2		Darjeeling	Darjeeling	3118.50	237.00	350.20	453.00	169.10	11.00	1220.30
3		Malbazar	Jalpaiguri	3468.30	633.10	850.90	787.40	1318.00	280.00	4496.00
4		Jalpaiguri			644.10	702.20	551.70	653.40	11.00	3267.50
5	Jaldhaka	Banarhat			728.20	1090.1	523.20	1343.00	158.00	4824.20
6		Mainaguri			625.23	602.77	562.92	755.01	19.00	3081.93
7		Mathabhanga	Coochbehar	3443.70	274.60	514.40	327.80	264.00	31.60	1932.80
8	Sankosh	Barabisha	Alipurduar	3468.30	850.20	587.80	366.60	872.40	14.60	2691.60
9	Torsa	Hasimara			1067.2	1367.0	939.00	1029.20	126.60	5267.80
10		Alipurduar			702.00	658.00	534.40	858.00	127.00	3604.20
11		Coochbehar	Coochbehar	3443.70	551.80	579.60	487.40	412.40	16.40	2745.90
12		Tufanganj			508.36	632.40	532.60	630.80	17.00	3256.50
13	Mahananda-Fulhar	Siliguri	Darjeeling	3118.50	664.20	707.00	469.90	695.25	13.50	2840.80
14		Islampur	Uttar Dinajpur	1727.60	203.64	455.30	258.50	188.20	10.50	1627.90
15		Raiganj			76.10	213.10	169.40	217.20	11.60	1029.60
16		English Bazar	Malda	1419.40	67.70	284.10	156.96	143.00	60.90	1120.20
17	Atreyee	Balurghat	Dakshin Dinajpur	1584.90	230.40	457.20	165.60	153.40	21.00	1336.00
18	Punarbhaba	Gangarampur			256.70	327.65	231.50	115.60	24.00	1264.50
19	Bhagirathi - Hooghly	Berhampore	Murshidabad	1391.10	115.00	280.00	136.40	145.20	99.80	945.20
20		Katwa	Purba Burdwan	1315.20	124.60	209.28	137.16	81.43	26.39	744.74
21	Jalangi	Swarupganj	Nadia	1261.60	175.20	508.20	228.80	109.40	17.20	1187.60
22	Pagla-Bansloi	Paikor	Birbhum	1392.80	66.60	150.20	178.40	104.20	126.00	818.60
23	Brahamani-Dwarka	Md. Bazar			102.00	421.00	245.25	167.50	48.25	1070.50
24		Rampurhat			284.00	159.00	235.40	156.40	58.80	1082.40
25		Mallarpur			90.00	245.10	219.60	148.10	39.10	891.90
26		Deocha			168.60	327.30	232.80	179.80	29.70	1153.50
27	Mayurakshi-Babla	Haripur	Dumka	1381.50	90.00	197.40	268.80	80.40	8.00	644.60
28		Khusiary			145.20	248.20	415.20	144.00	7.00	959.60
29		Maharo			126.40	186.00	188.20	208.00	34.40	743.00
30		Massanjore			252.60	249.20	182.40	189.00	8.20	1028.40
31		Tantloi			43.20	172.60	84.20	172.00	5.20	477.20
32		Tilpara	Birbhum	1392.80	107.40	275.00	230.20	177.20	22.20	1006.60
33		Shyambati			154.00	270.40	212.60	188.00	36.00	1014.00
34		Kandi	Murshidabad	1391.10	198.60	220.70	161.10	89.10	16.00	879.30
35	Ajay-Hinglow	Sikatia	Deoghar	1162.10	95.20	230.40	118.00	92.80	13.80	550.20
36		Hinglow	Birbhum	1392.80	245.10	465.00	177.00	227.00	18.00	1279.10
37		Debogram			192.00	243.00	232.00	340.00	18.00	1323.00
38		Satkahania	Paschim Burdwan	1315.20	38.30	140.30	105.91	66.22	8.60	405.55
39		Guskara			148.00	221.20	115.00	147.00	51.00	719.00
40	Damodar	Tilaiya	Kodarma	1116.20	158.60	260.00	395.80	144.60	19.20	978.20
41		Tenughat	Bokaro	1247.50	117.40	264.80	165.20	102.80	34.80	685.00
42		Maithon	Dhanbad	1355.20	198.60	400.80	265.60	141.60	17.20	1023.80
43		Panchet			186.20	339.60	233.40	191.00	15.80	966.00

Sl	RIVER BASIN	Location of Rain Gauge Station	District	District wise Normal Annual Rainfall (mm)	Station wise Monthly Rainfall (mm)					Stn-wise Cum. Rainfall (mm)
					Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	
44		Asansol	Paschim Burdwan	1315.20	187.40	529.60	217.70	233.80	7.40	1365.10
45		Durgapur			101.70	349.40	211.20	153.20	16.60	913.89
46		Kanainatsal	Purba Burdwan		15.20	273.50	228.30	160.60	22.10	699.70
47		Sonamukhi	Bankura	1330.90	267.00	225.00	156.00	128.00	14.50	790.50
48	Khari-Behula-Ghea	Balgona	Purba Burdwan	1315.20	142.00	298.00	119.00	84.00	20.00	808.00
49		Memari			126.00	298.60	176.40	135.30	16.00	752.30
50	Mundeswari	Seharabazar			144.00	224.00	166.00	115.00	18.00	667.00
51		Raina			30.00	289.00	143.00	84.00	2.00	548.00
52	Amta Channel (Damodar)	Champadanga	Hoogly	1418.70	92.50	259.75	223.00	143.75	24.00	743.00
53		Singur			115.00	376.51	213.25	140.50	26.75	882.50
54		Amta	Howrah	1600.00	98.00	312.00	170.00	233.00	33.00	1010.00
55		Domjur			181.00	308.00	174.00	134.00	25.00	987.00
56	Dwarakeswar	Bankura	Bankura	1330.90	252.60	262.00	447.20	108.80	31.80	1387.20
57		Indus			296.50	398.00	186.30	128.50	21.50	1030.80
58		Arambag	Hoogly	1418.70	153.50	340.50	250.50	137.25	24.50	1041.75
59	Shilabati	Amlagora	Paschim Medinipur	1535.50	93.60	143.40	163.00	90.00	35.00	575.20
60		Ghatal			224.80	254.20	217.60	257.60	48.80	1253.40
61	Kangsabati	Simulia	Purulia	1363.30	264.86	331.20	259.60	144.40	48.20	1234.20
62		Purihansa			268.80	324.40	228.80	99.80	48.20	1146.60
63		Tusuma			174.60	284.80	202.00	237.80	39.20	1197.60
64		Kharidwar			208.40	225.20	290.80	264.60	56.40	1208.60
65		Phulberia			190.20	277.60	366.80	205.00	57.40	1233.40
66		Mukutmanipur	Bankura	1330.90	207.20	222.60	182.20	144.20	43.40	1061.40
67		Midnapore	Paschim Medinipur	1535.50	192.80	307.20	294.60	232.40	48.60	1351.00
68		Panskura	Purba Medinipur	1669.60	400.50	352.63	244.81	262.92	100.39	1709.00
69	Rupnarayan	Tamluk			594.50	353.50	401.50	467.50	105.00	1927.00
70	Kaliaghai	Amgachia			352.30	222.70	304.50	360.80	127.40	1516.30
71		Sabang	Paschim Medinipur	1535.50	286.00	340.55	397.50	645.00	155.00	1995.00
72	Kangsabati	Jhargram	Jhargram		215.05	369.75	586.50	215.87	134.72	1827.49
73	Chandia	Barisha	Paschim Medinipur		271.00	278.00	241.00	296.50	157.50	1498.00
74	Haldi	Itamogra	Purba Medinipur	1669.60	307.20	238.40	256.50	333.10	120.30	1417.20
75	Rasulpur	Contai		1669.60	167.20	417.60	218.00	530.60	218.80	1811.40
76	Hooghly	Alipore	Kolkata	1709.20	419.70	281.30	273.10	221.50	56.60	1252.20
77	Ichhamati	Bangaon	North 24-Parganas	1560.30	241.10	325.60	236.80	124.40	43.80	1285.70
78		Tentulia			265.00	389.00	151.00	149.00	97.00	1236.00
79	Bidyadhari	Dumdum			145.20	506.80	274.70	192.60	46.30	1165.60
80		Chowbaga	South 24-Parganas	2088.00	349.00	398.00	229.00	380.00	48.00	1404.00
81	Sundarban	Uttarbhag			273.00	413.00	158.00	120.00	91.00	1055.00
82	Subarnarekh	Digha	Purba Medinipur	1669.60	126.75	211.00	363.00	428.70	337.00	1799.00

Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018



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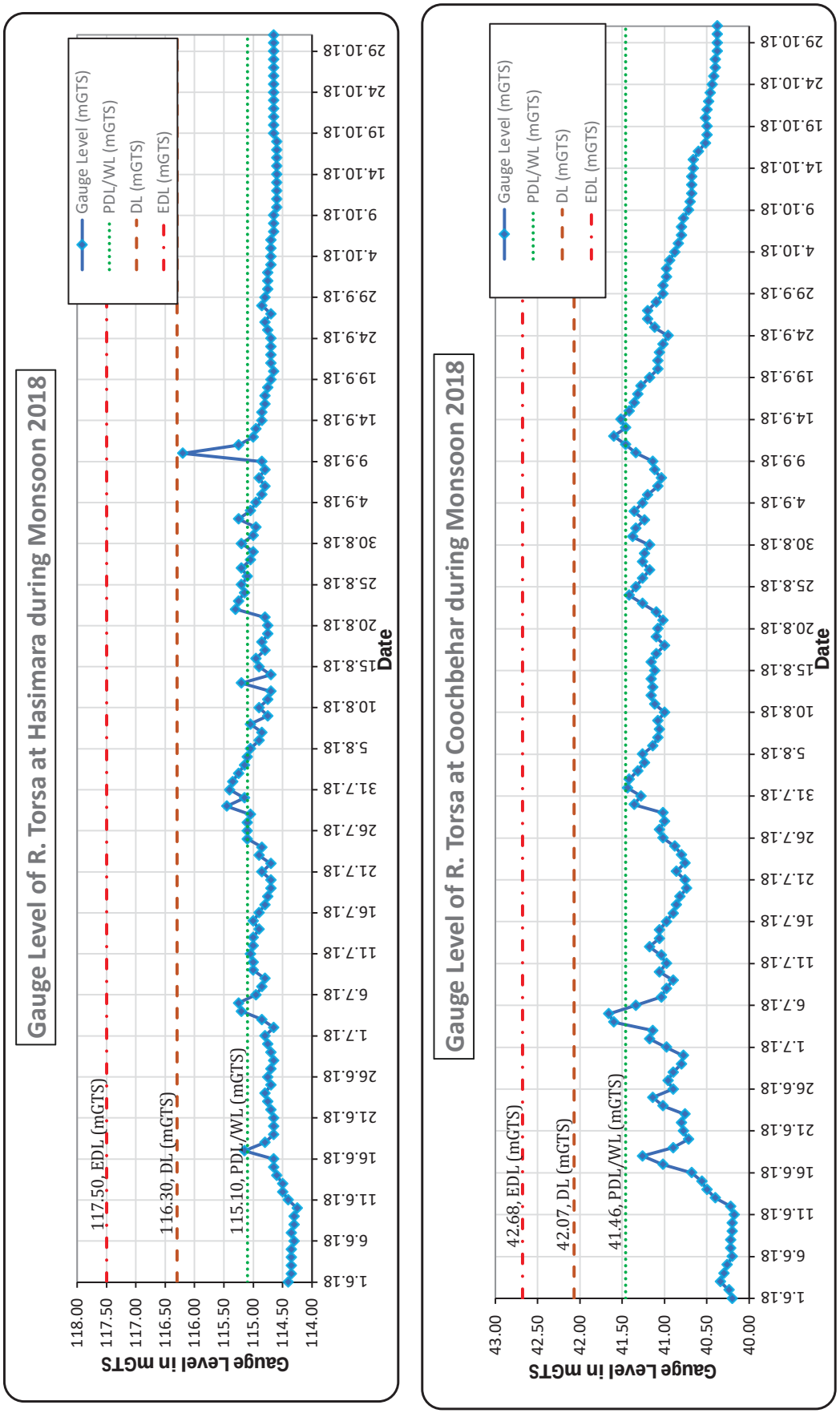

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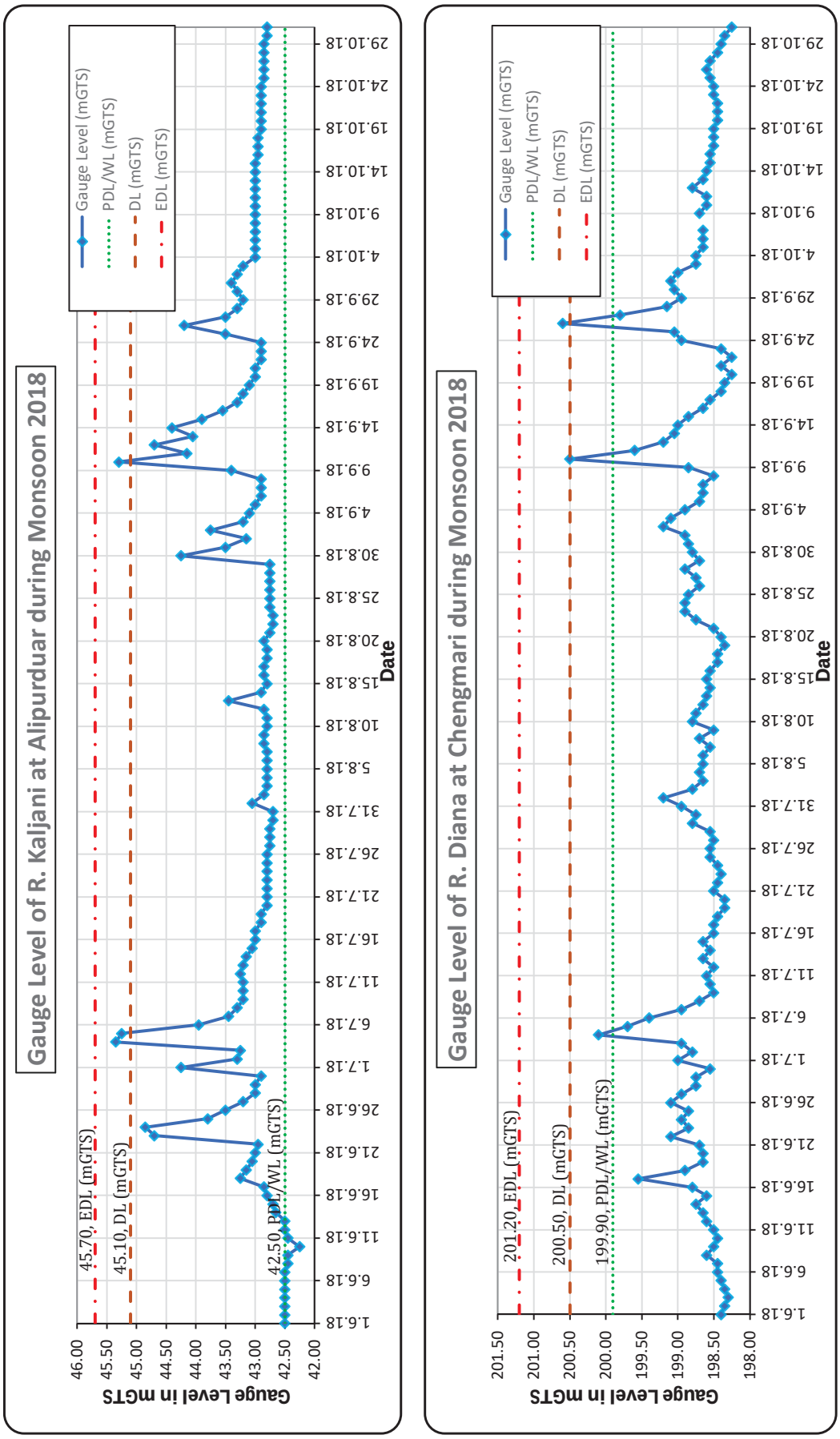

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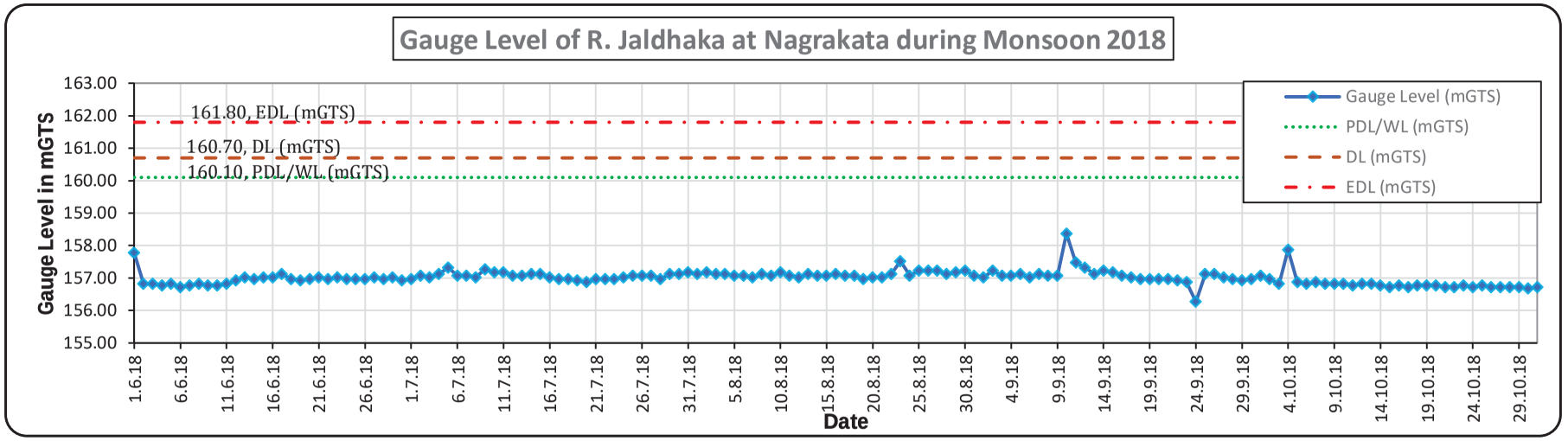

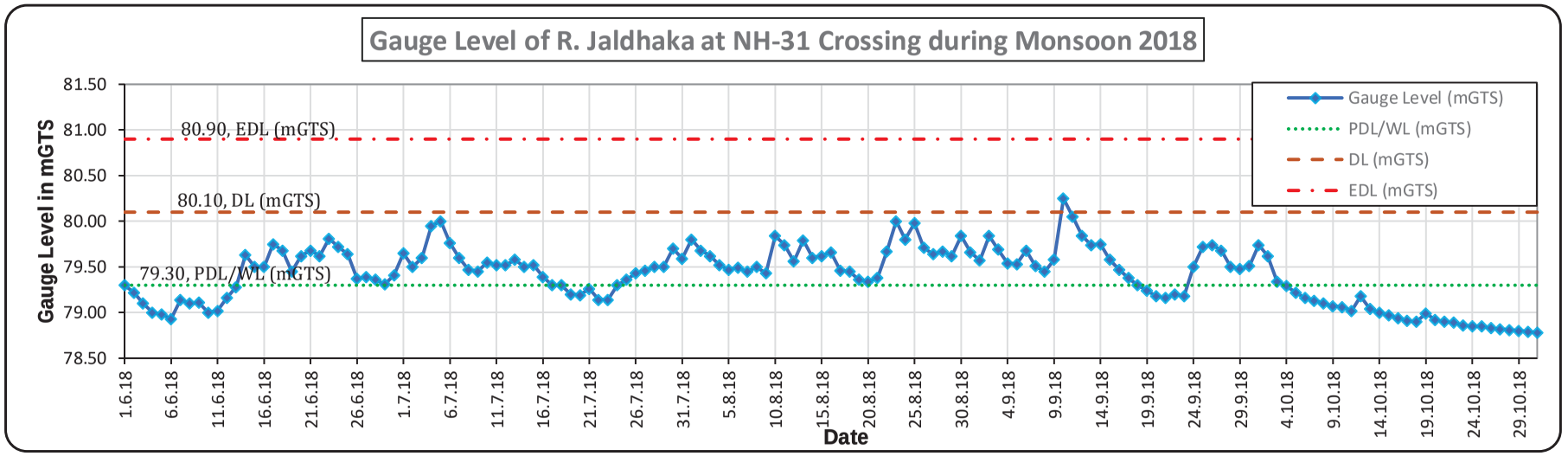

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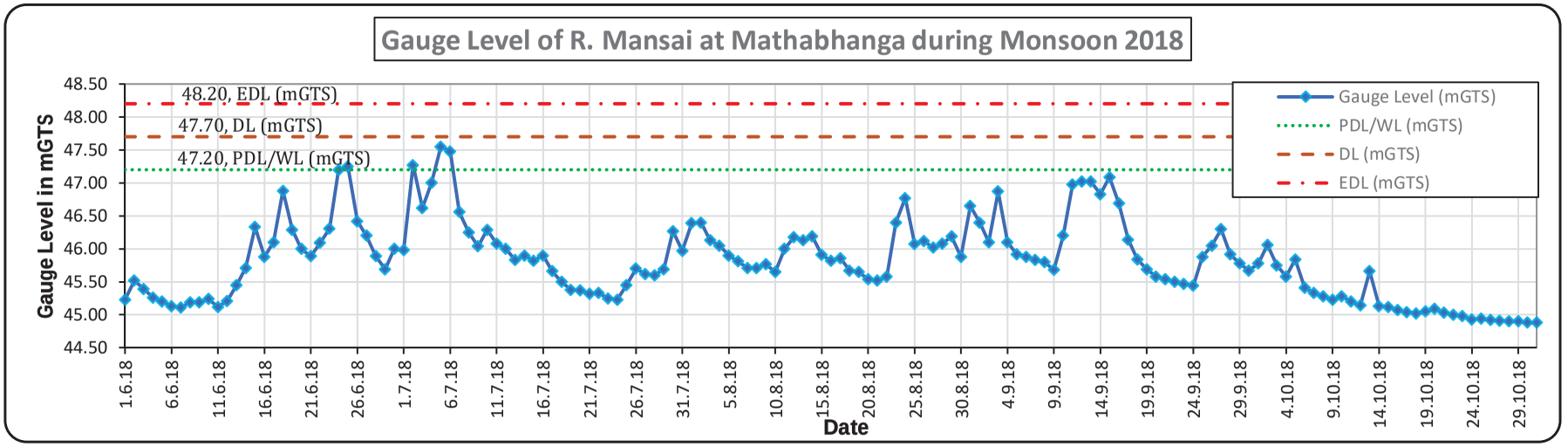
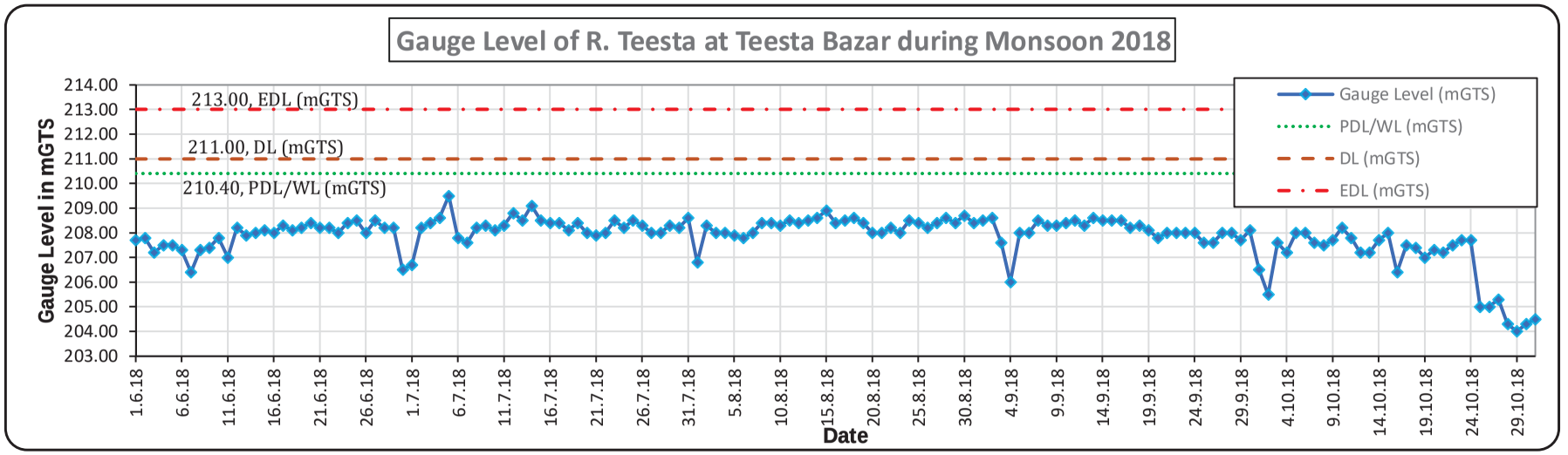
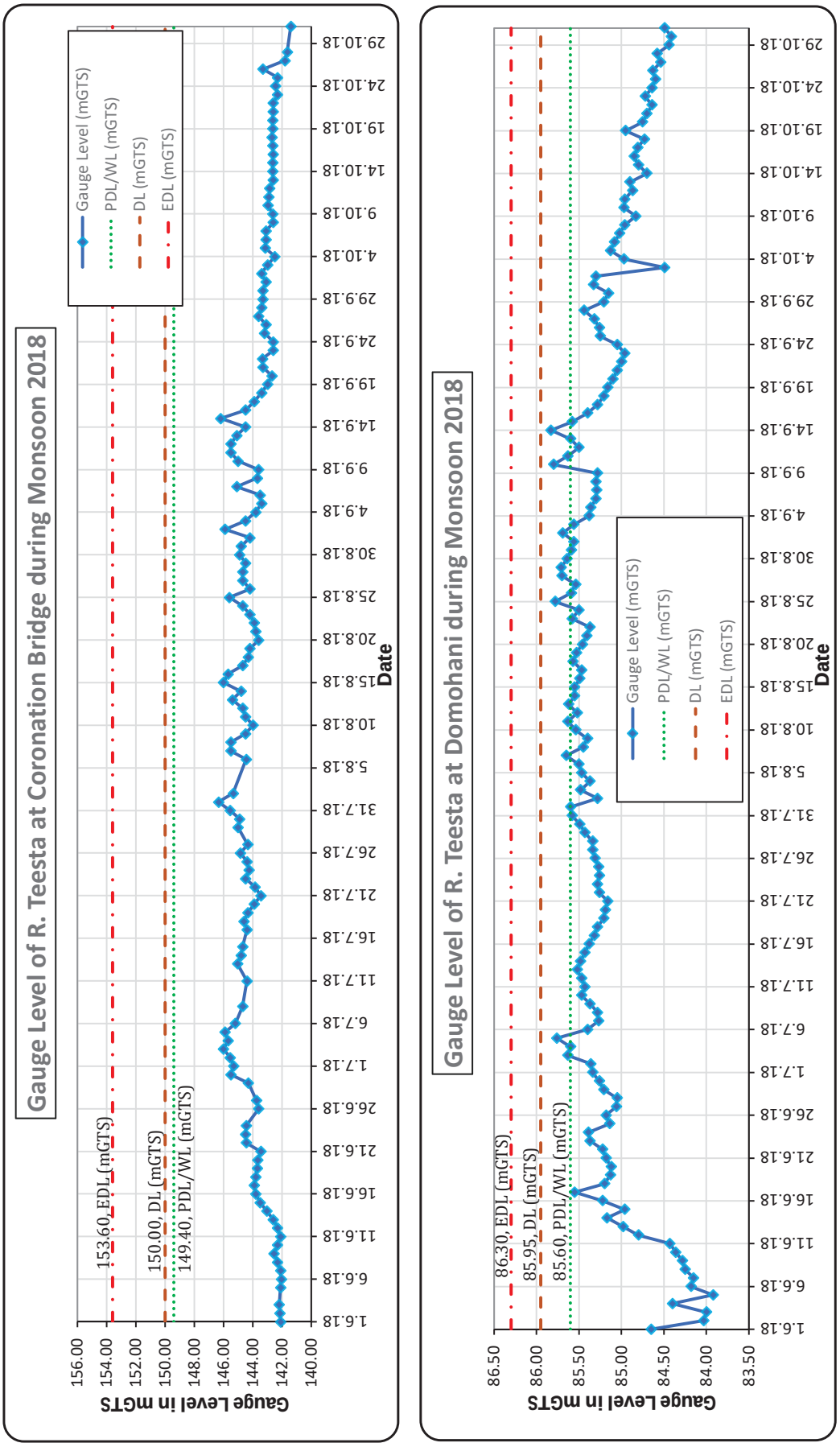
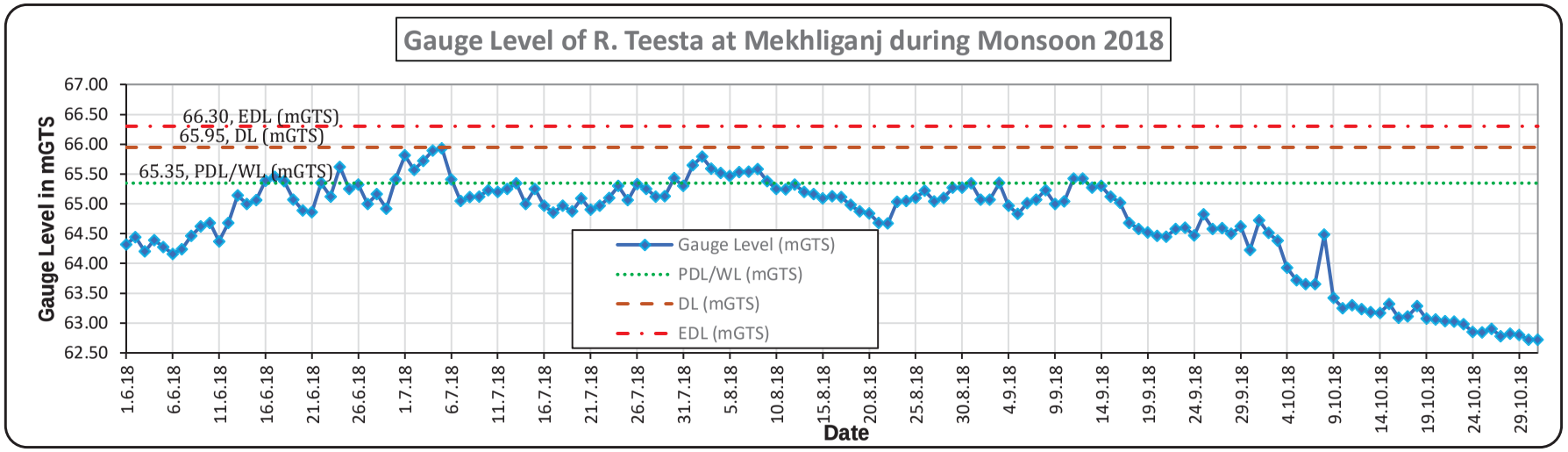


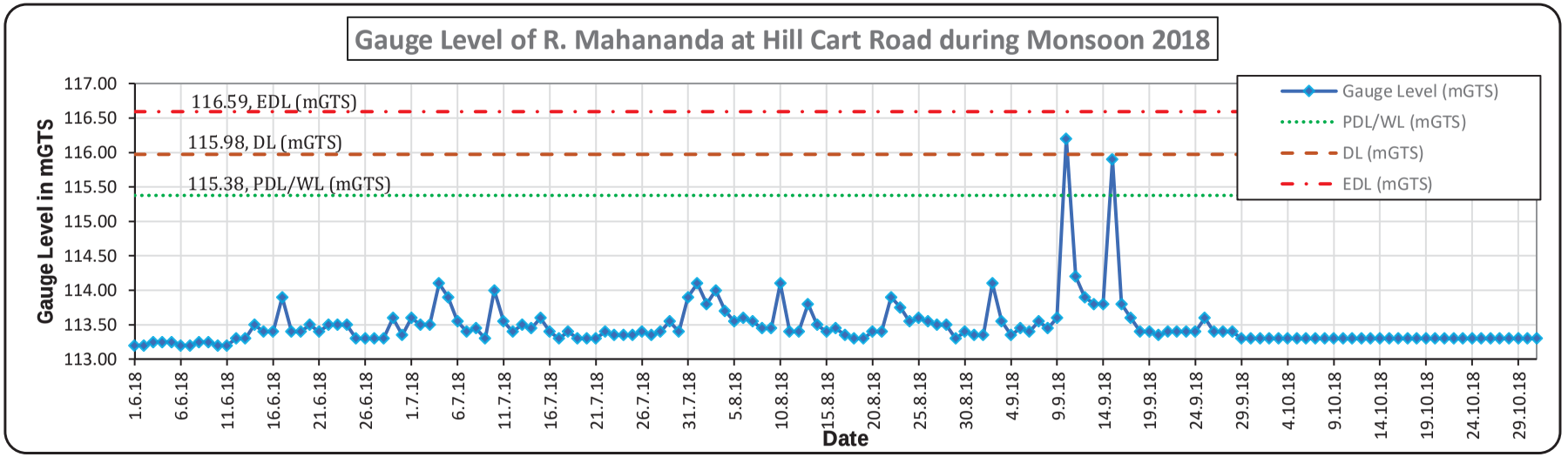


Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018

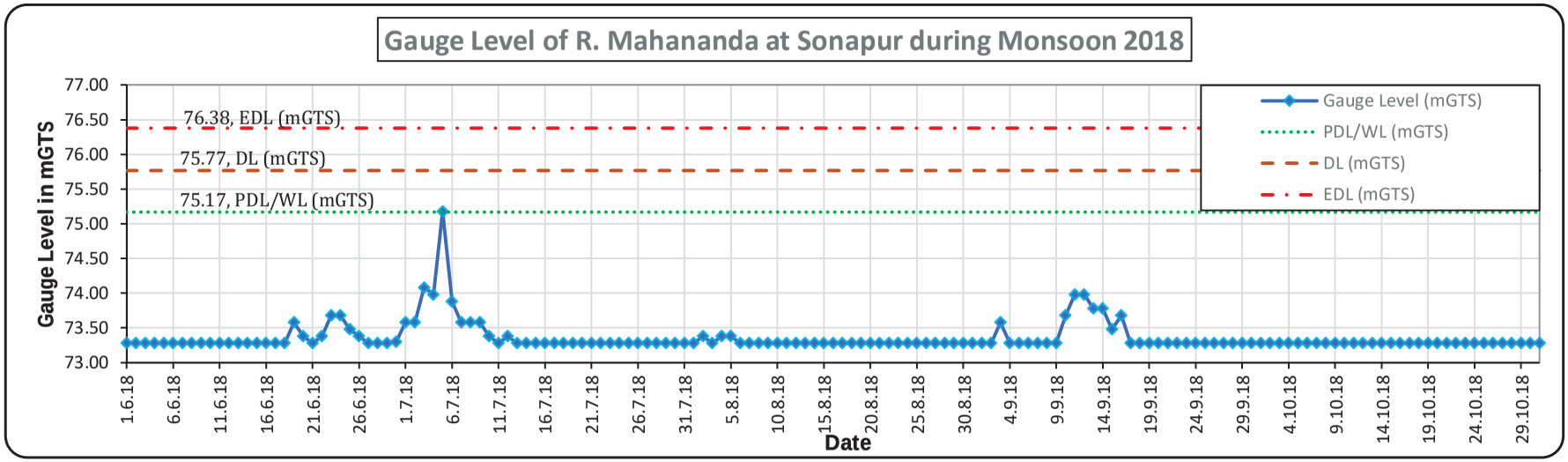


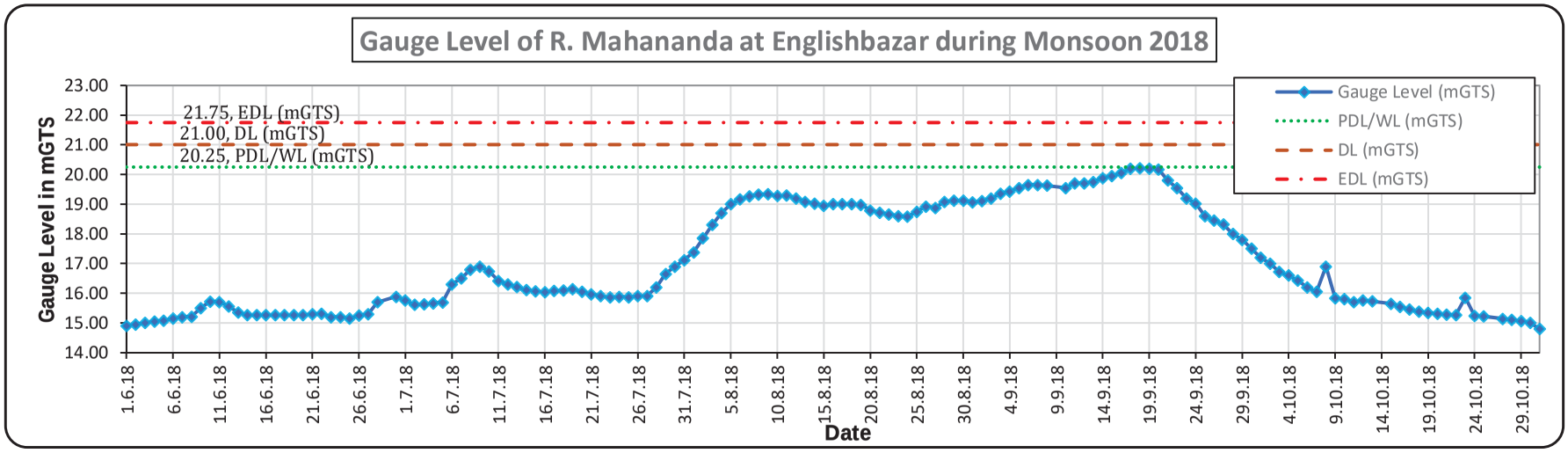
Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018



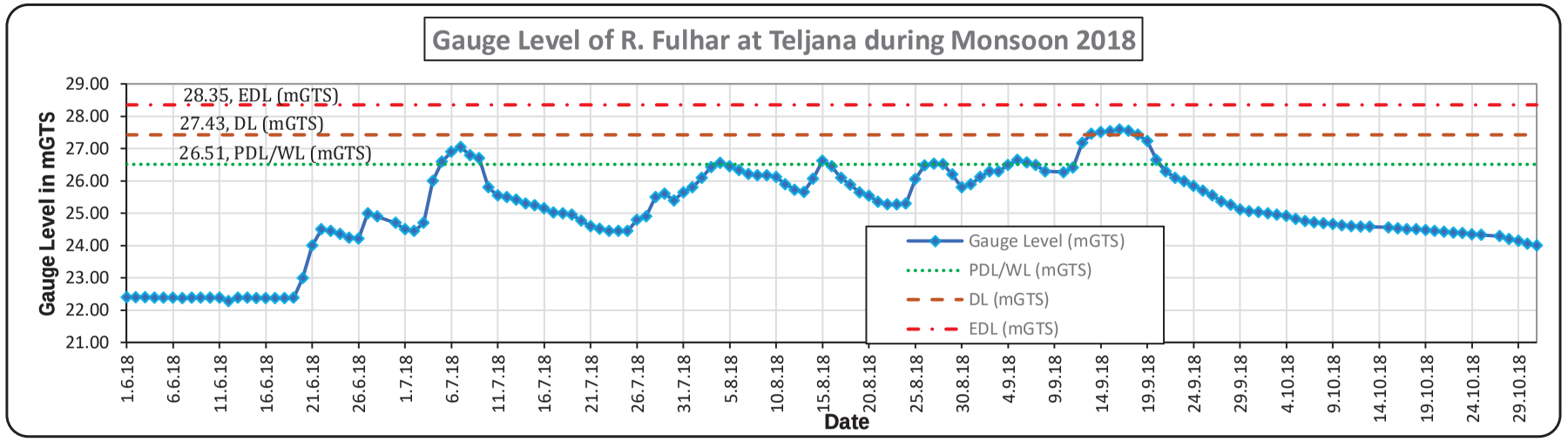


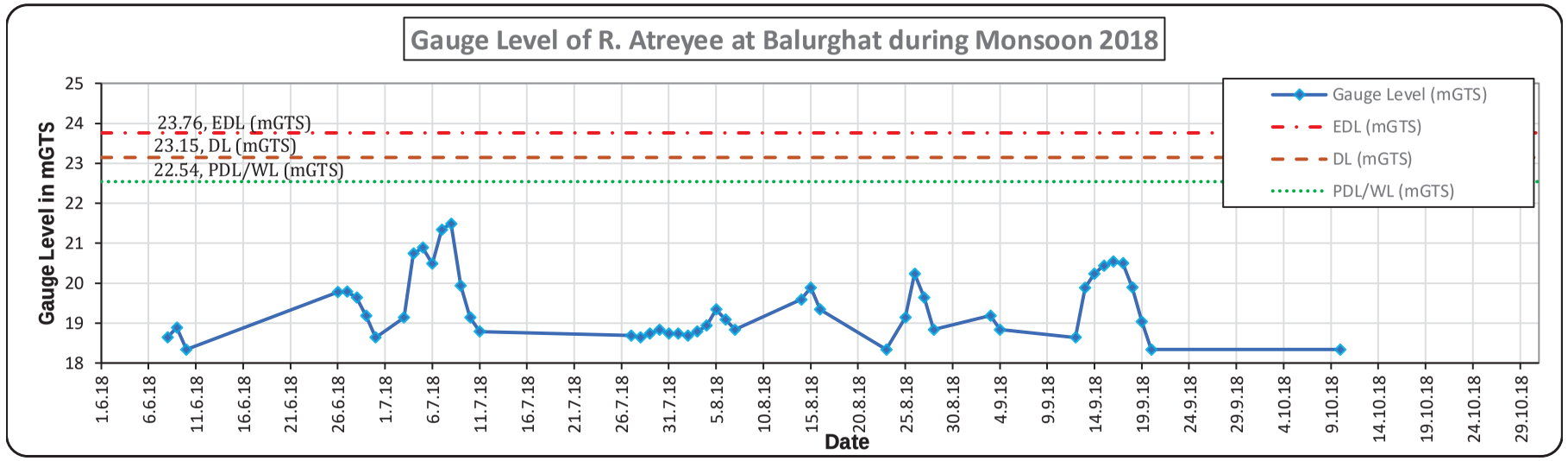
Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018



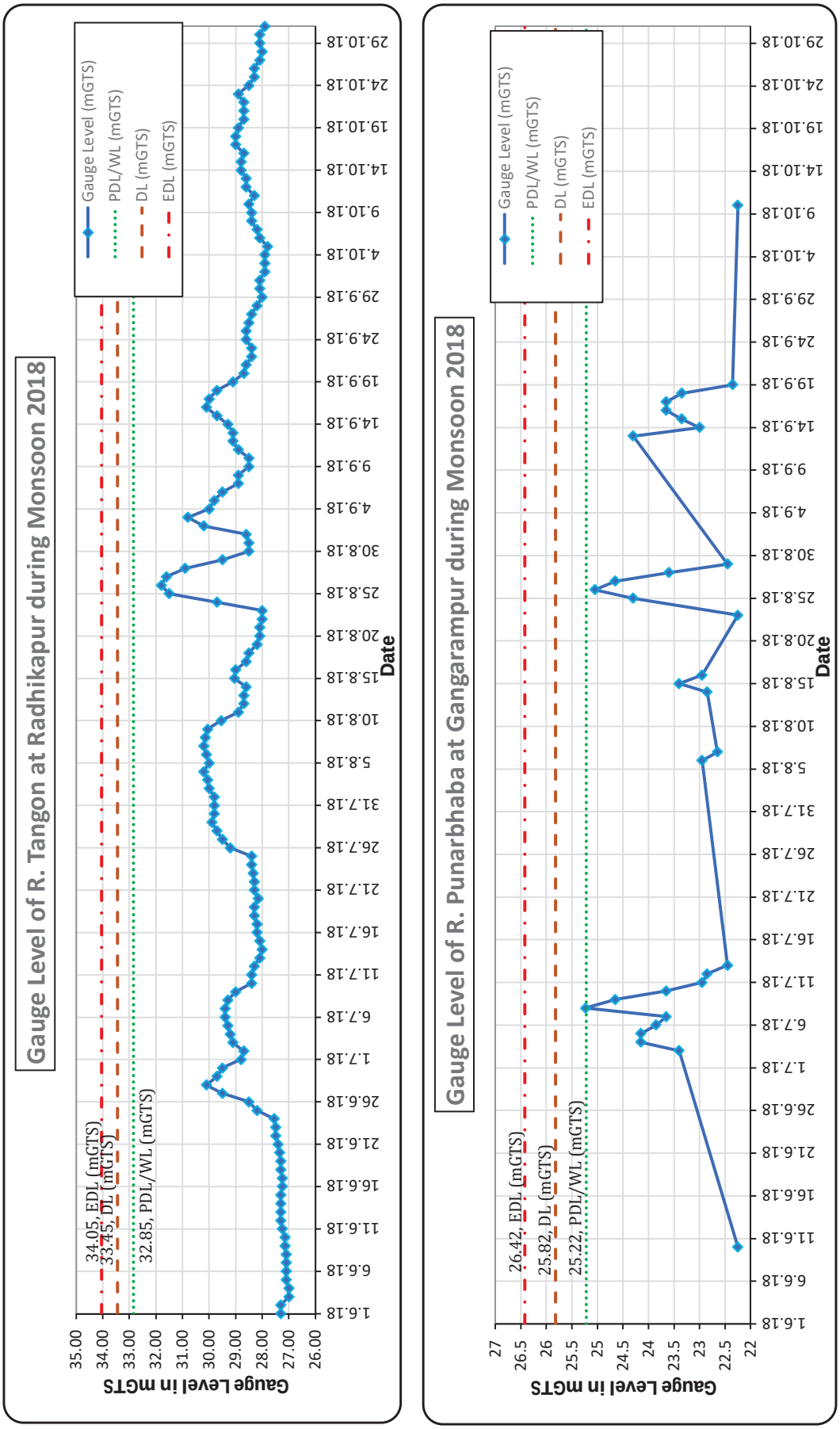


Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018

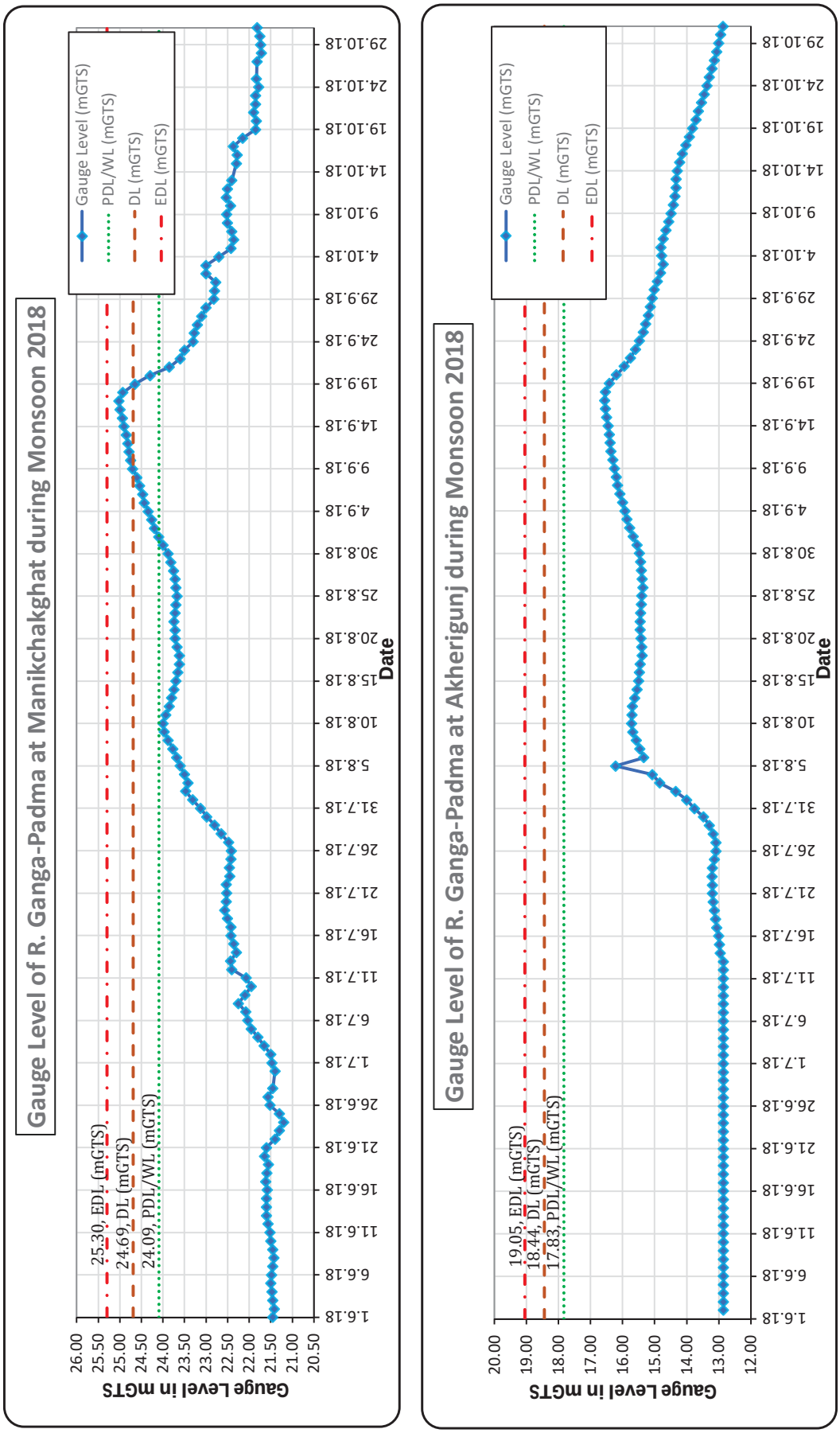




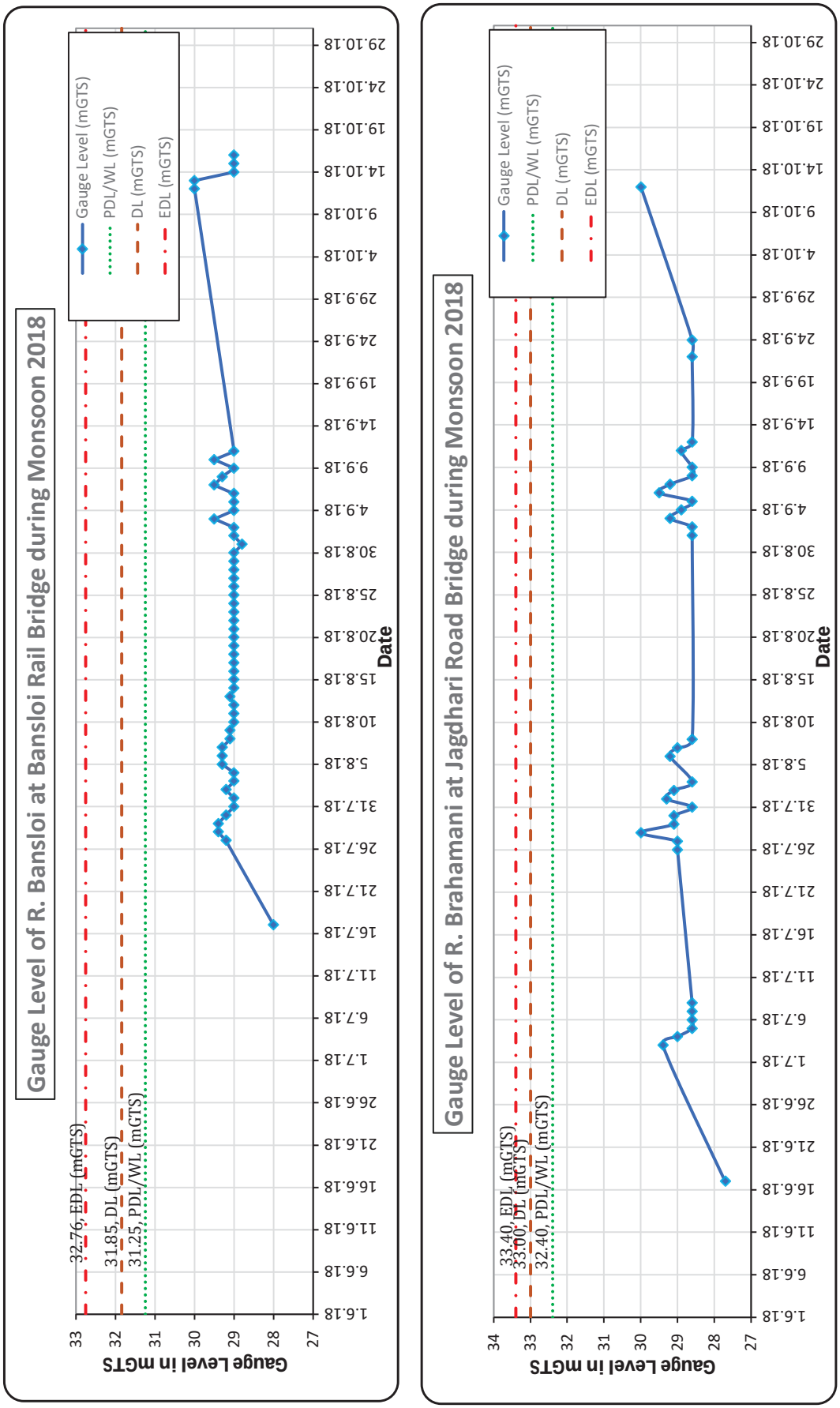
Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018



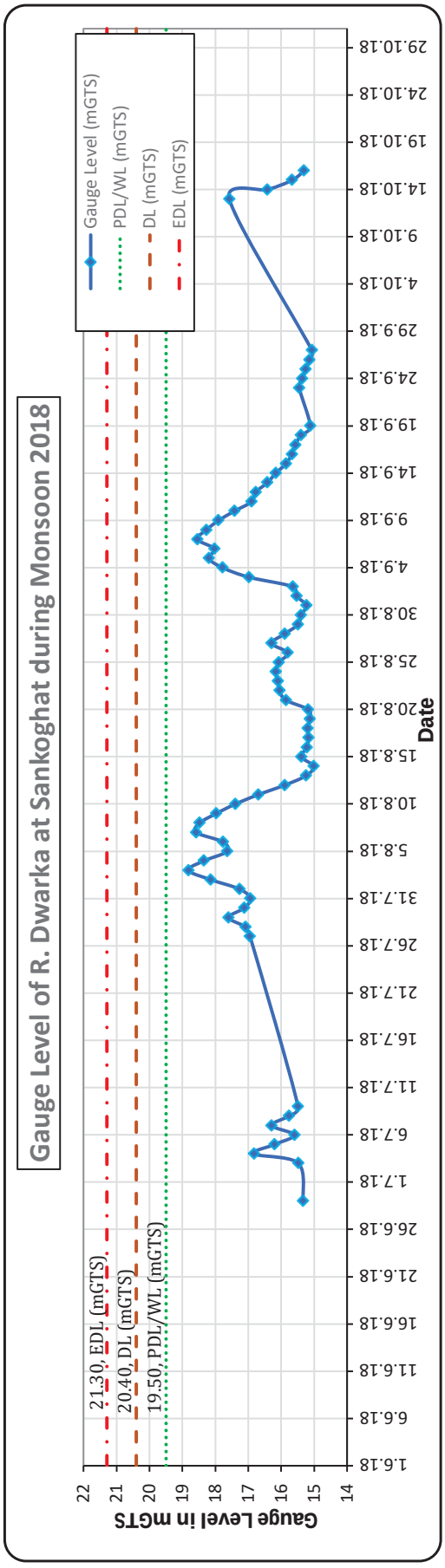
Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018

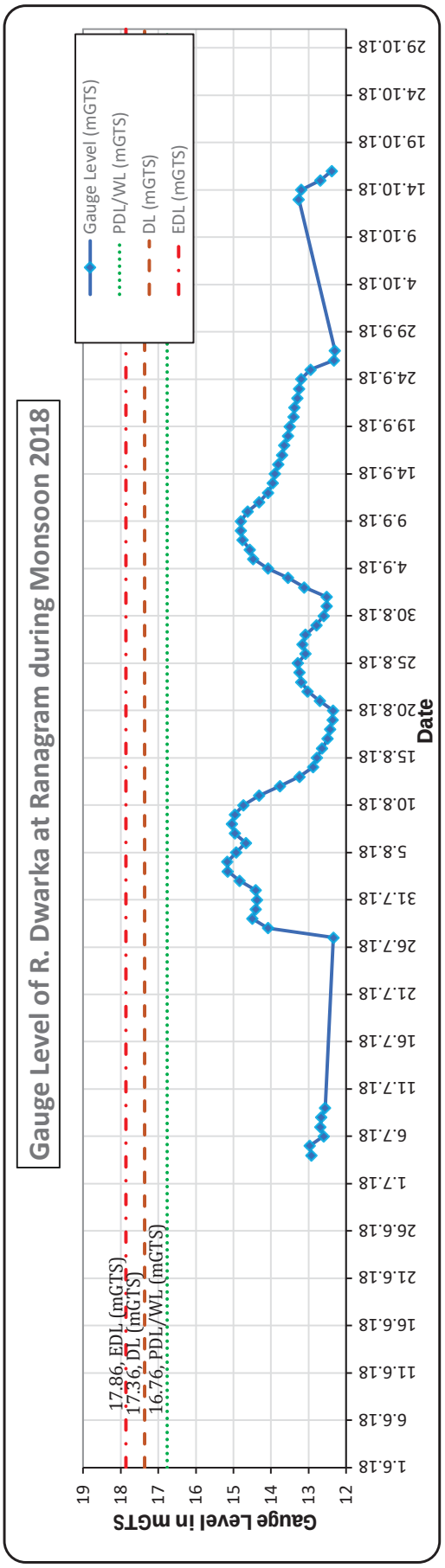


Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018

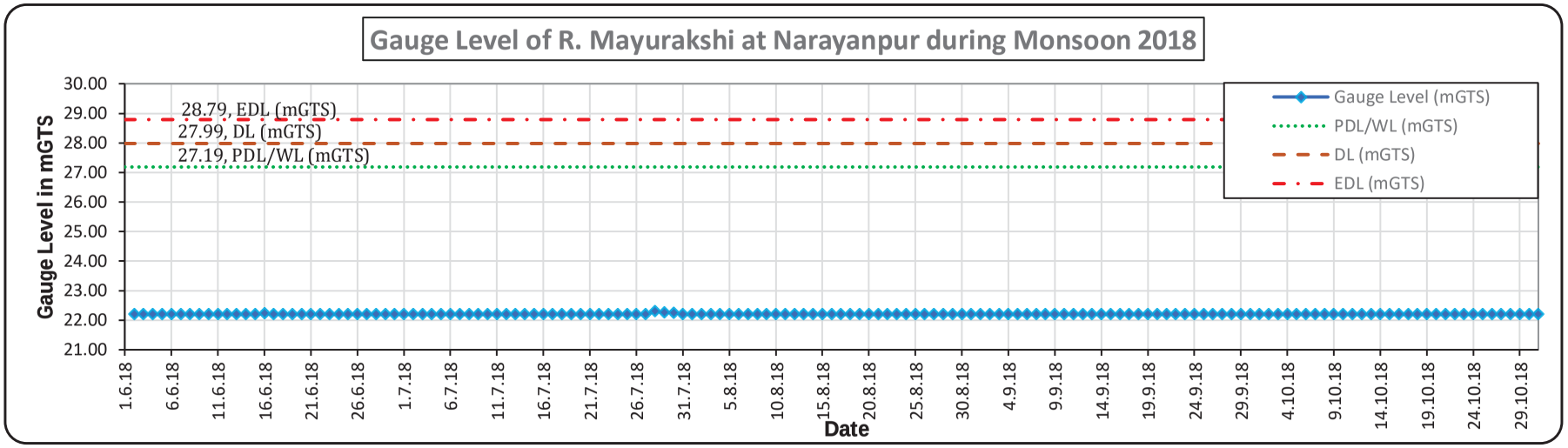


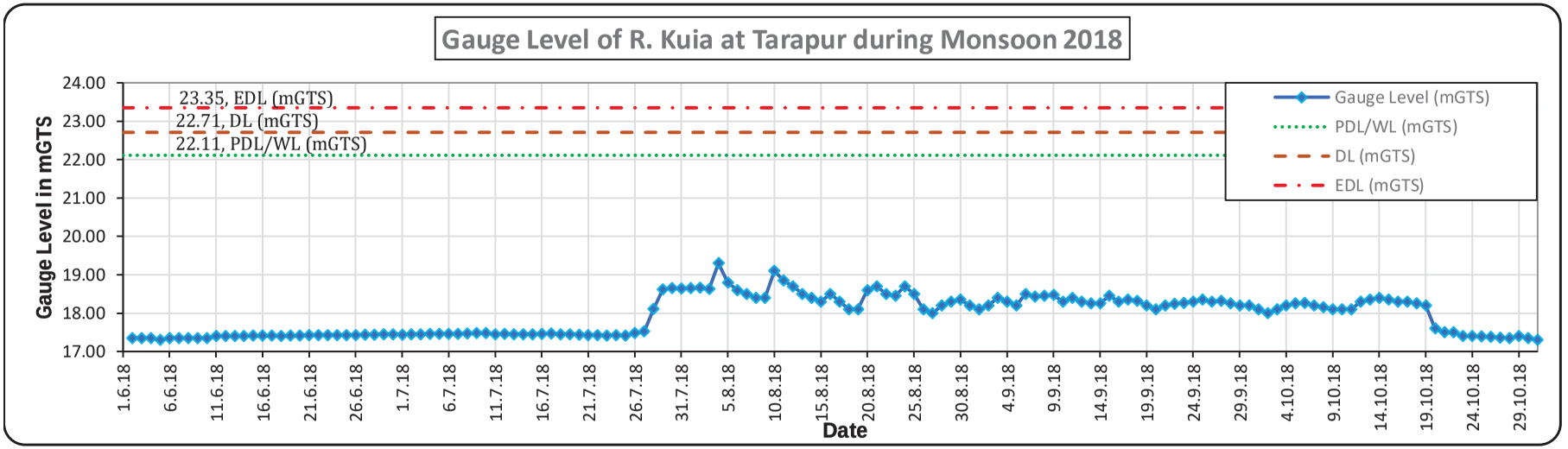
Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018





Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018





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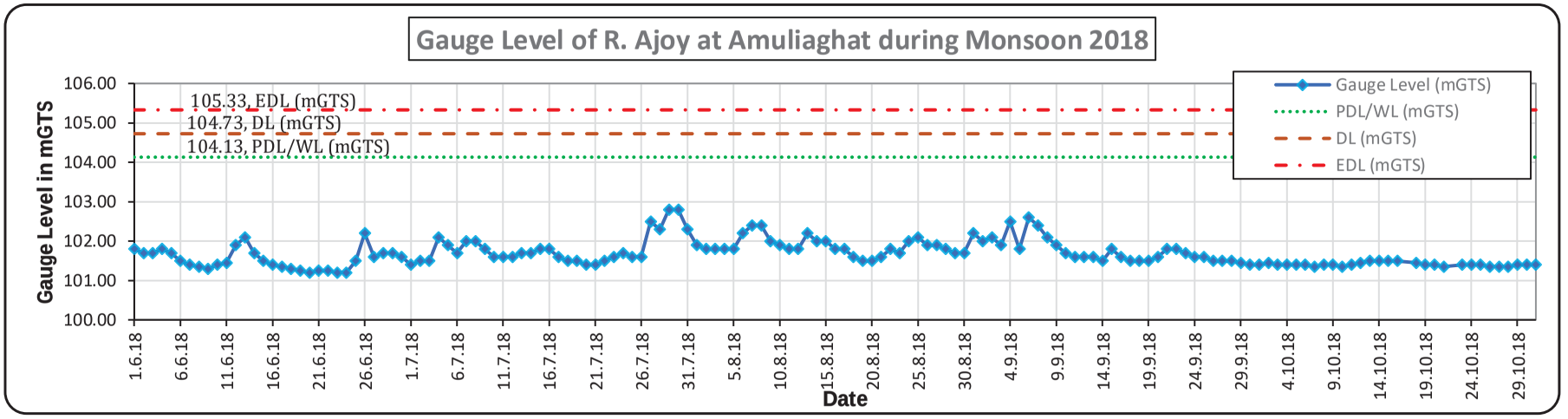
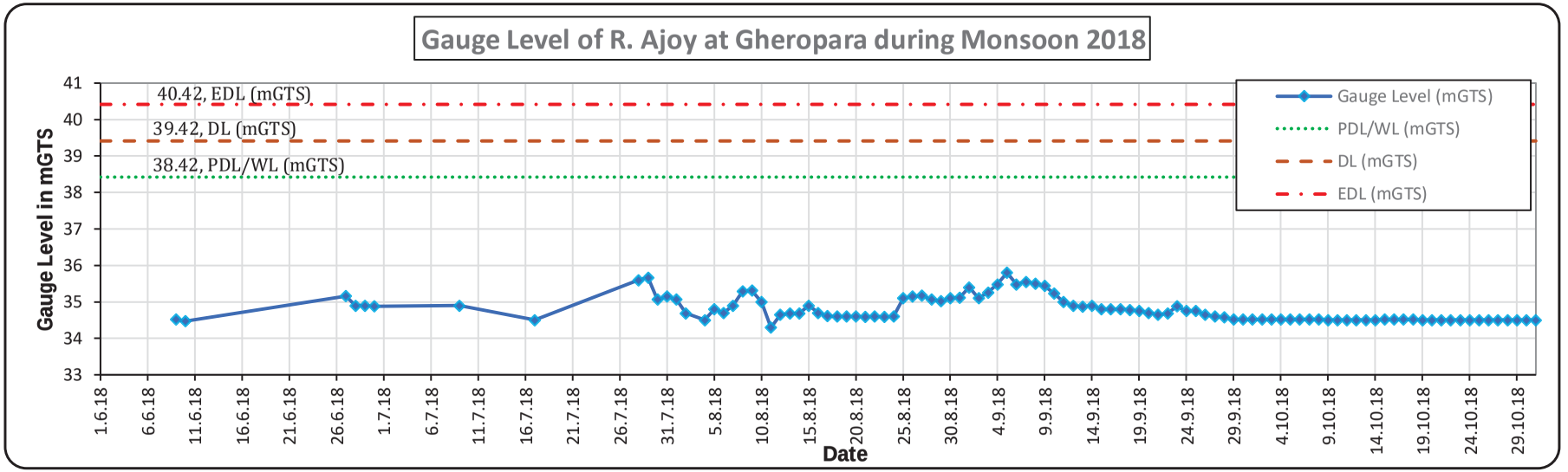
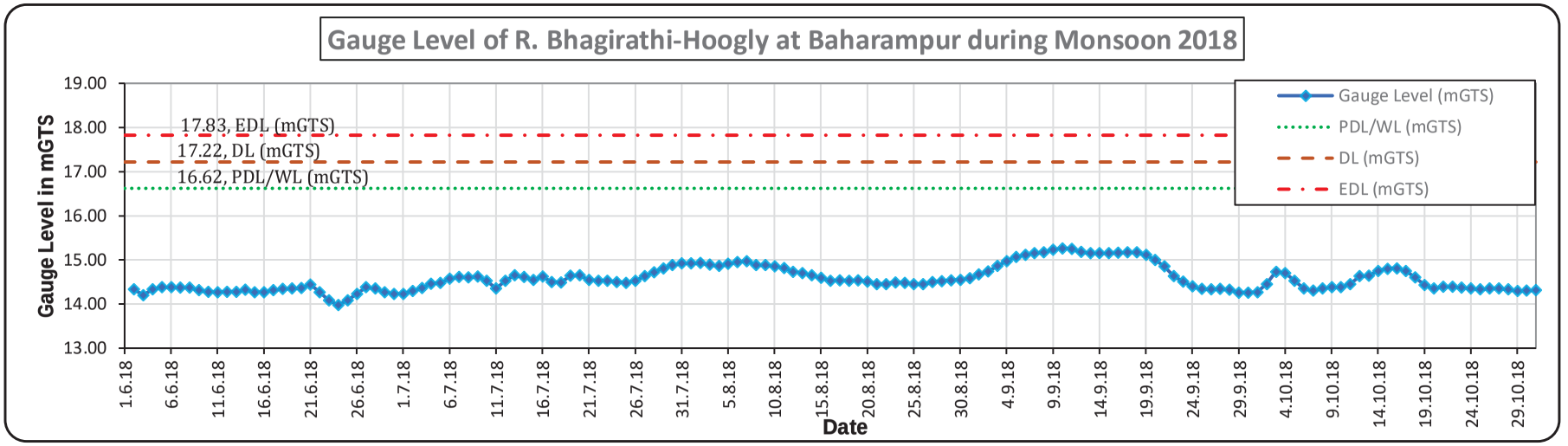
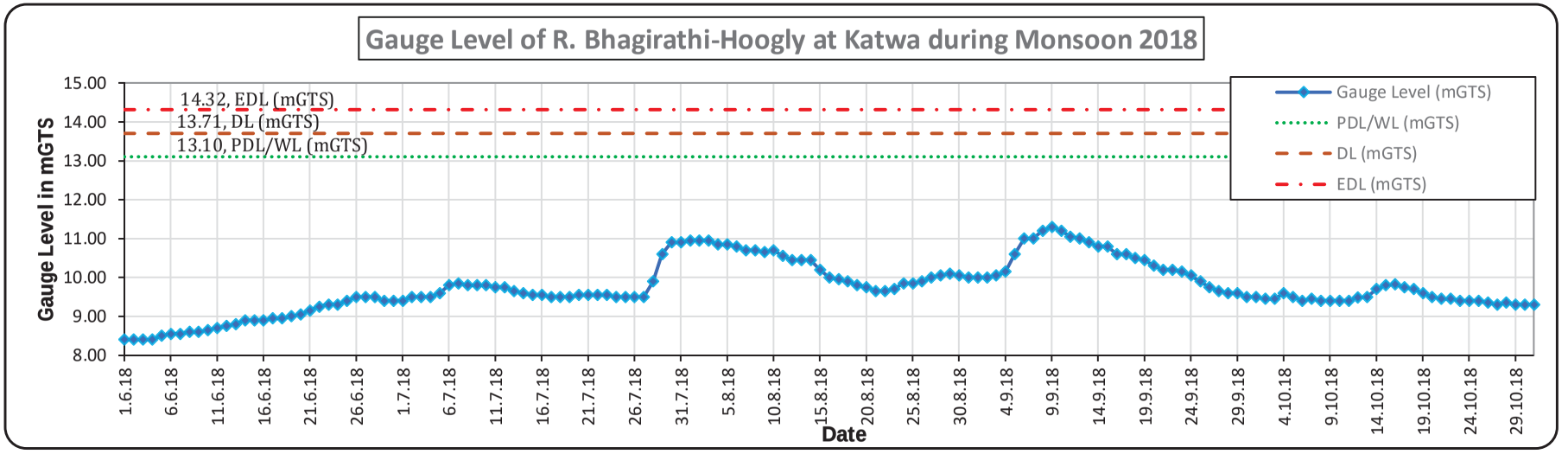


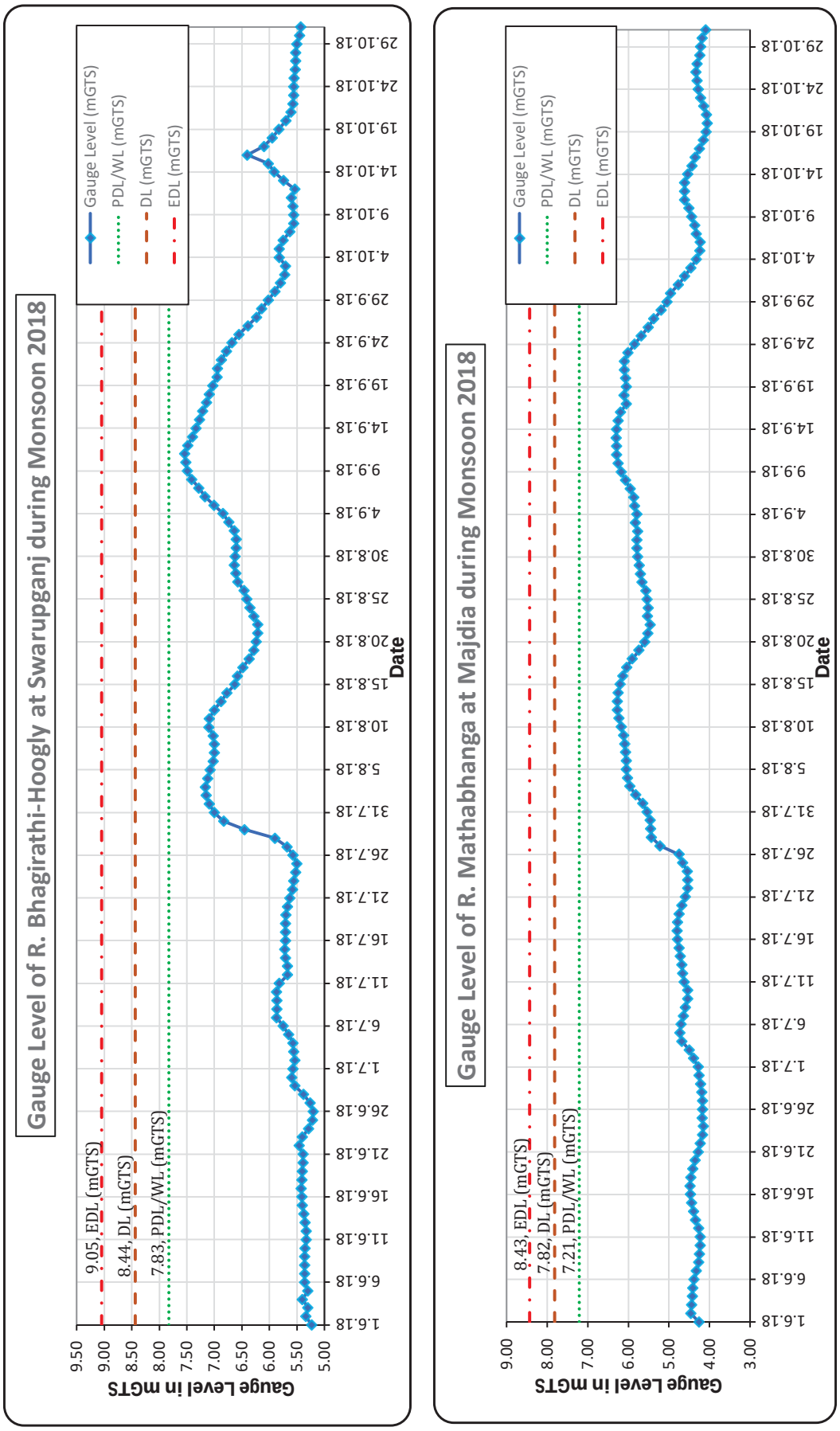


Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018

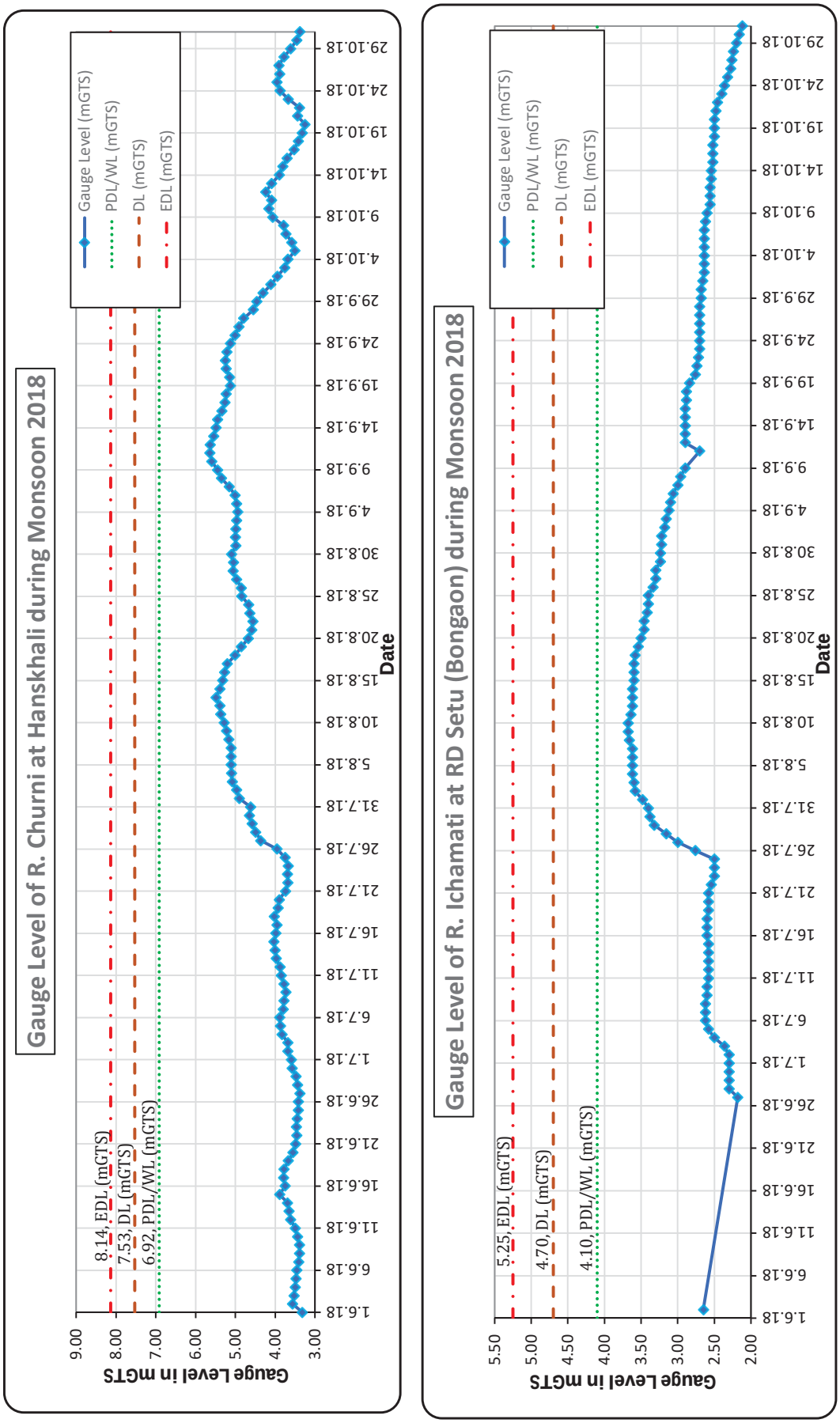




Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018



Annexure VII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018



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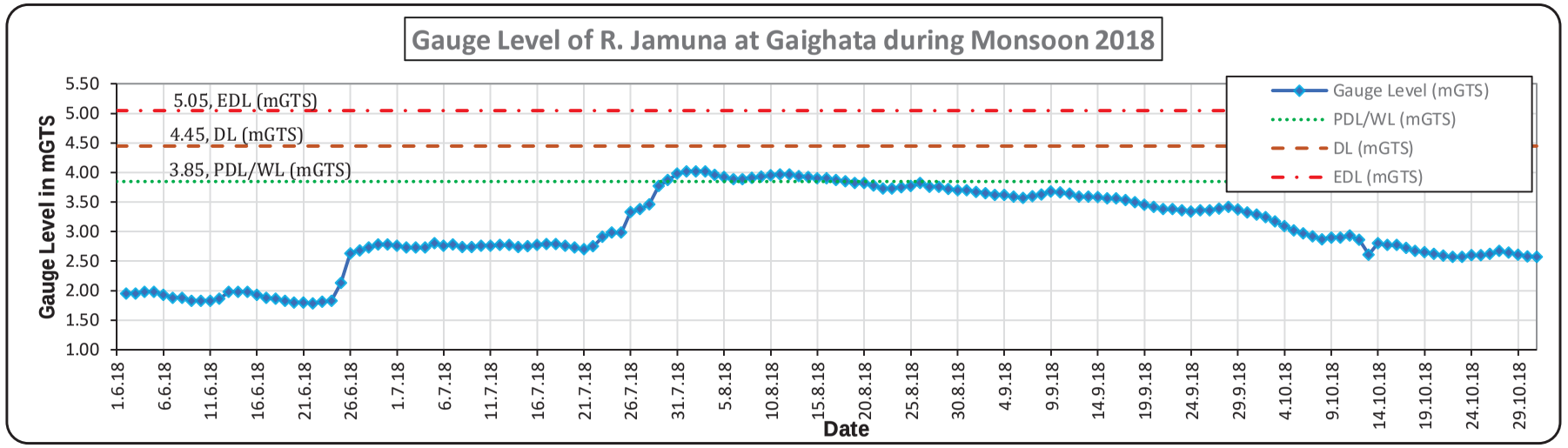

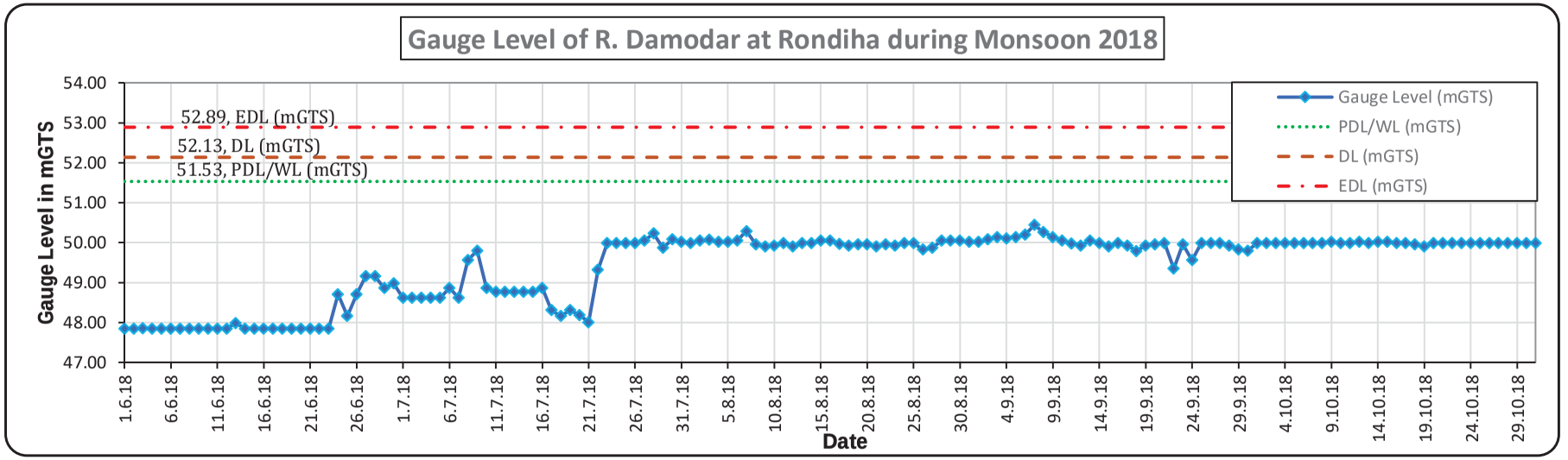

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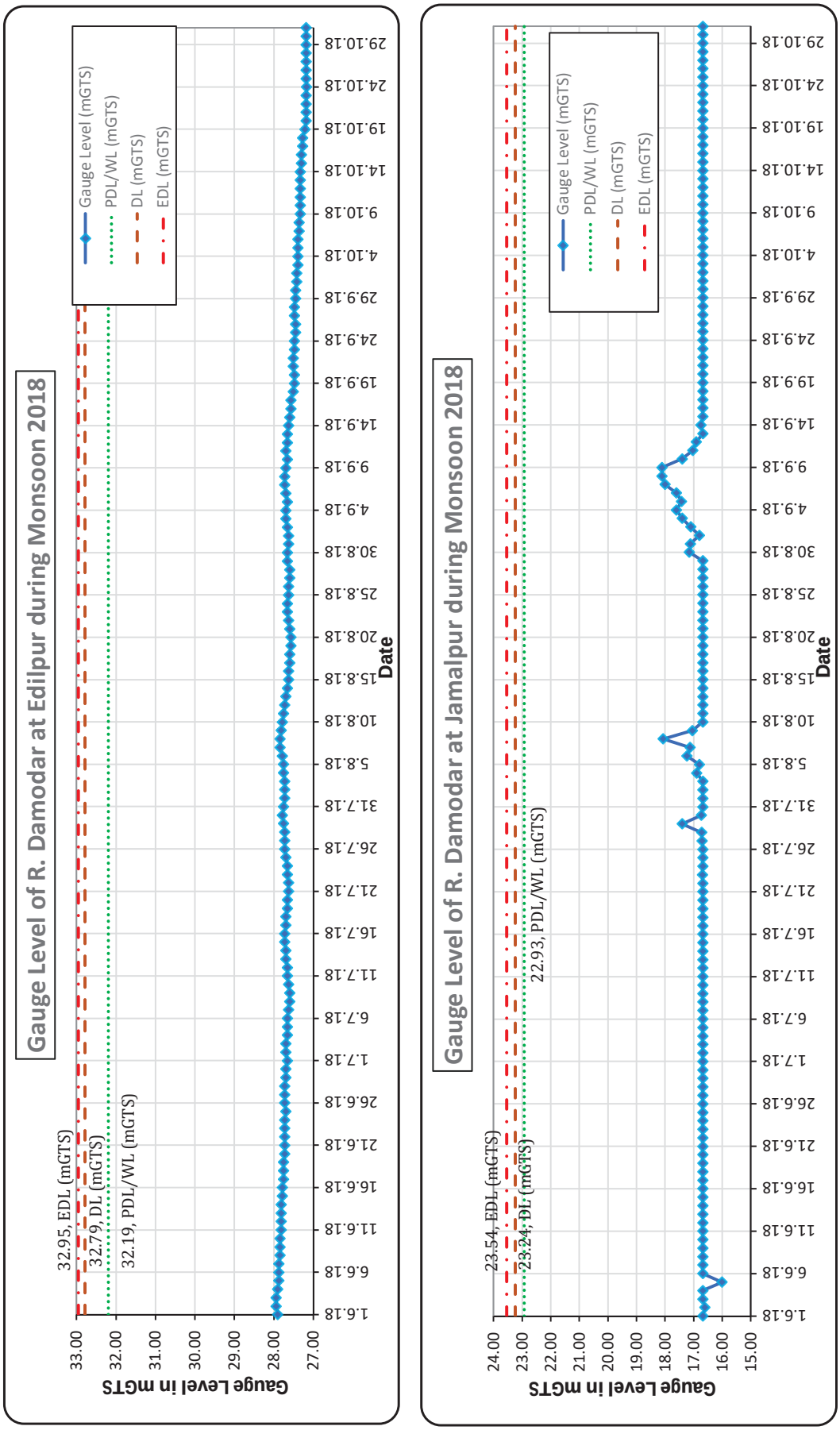

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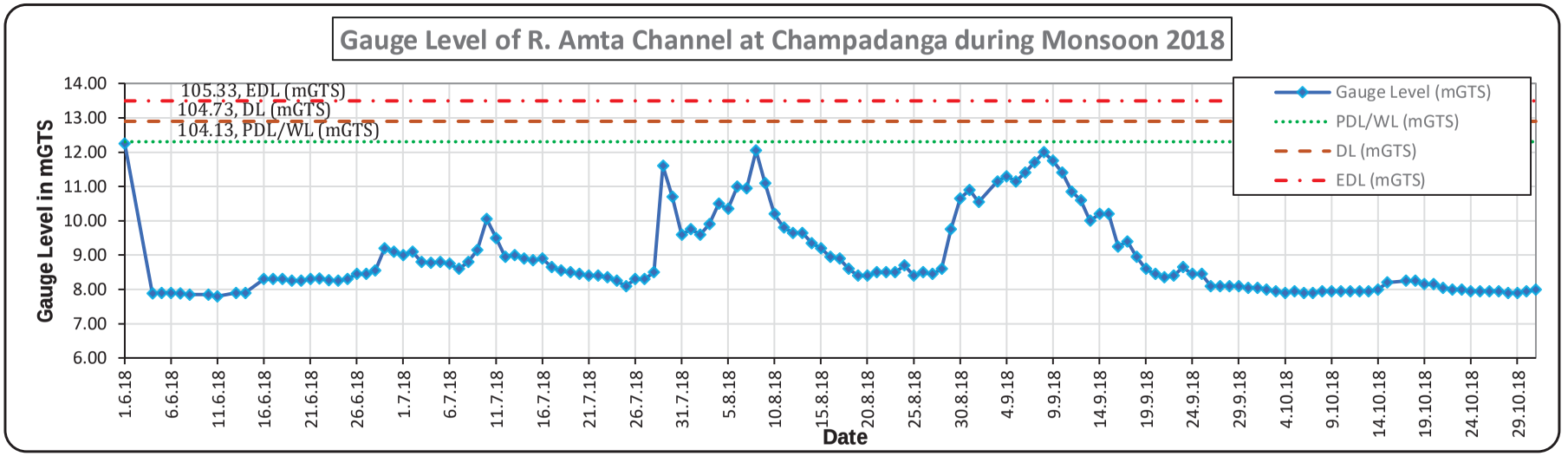
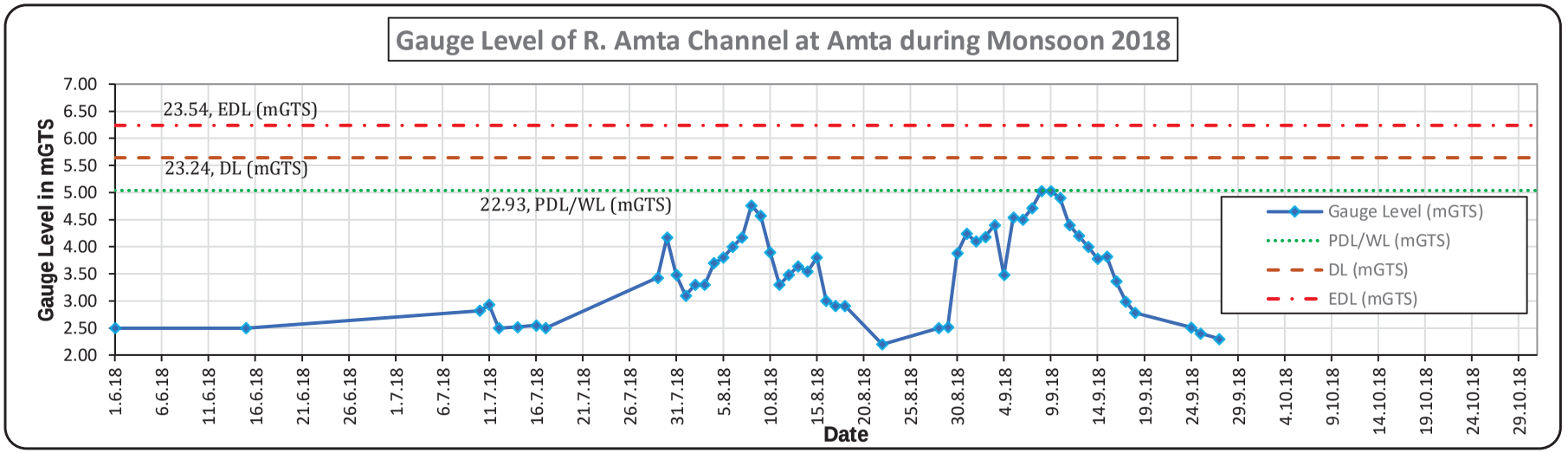
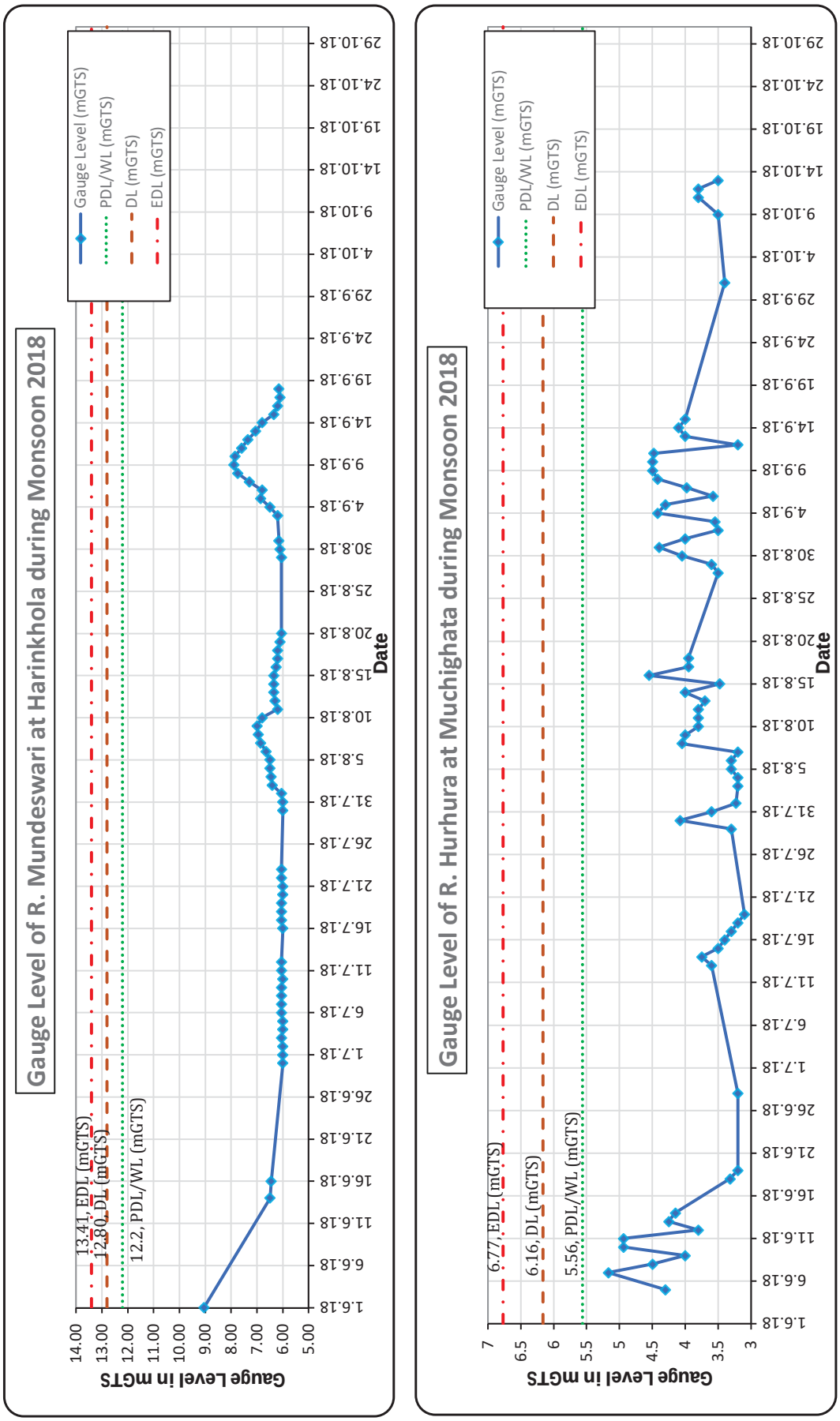




Annexure VIII: Gauge Levels of Different Rivers of West Bengal During Monsoon 2018



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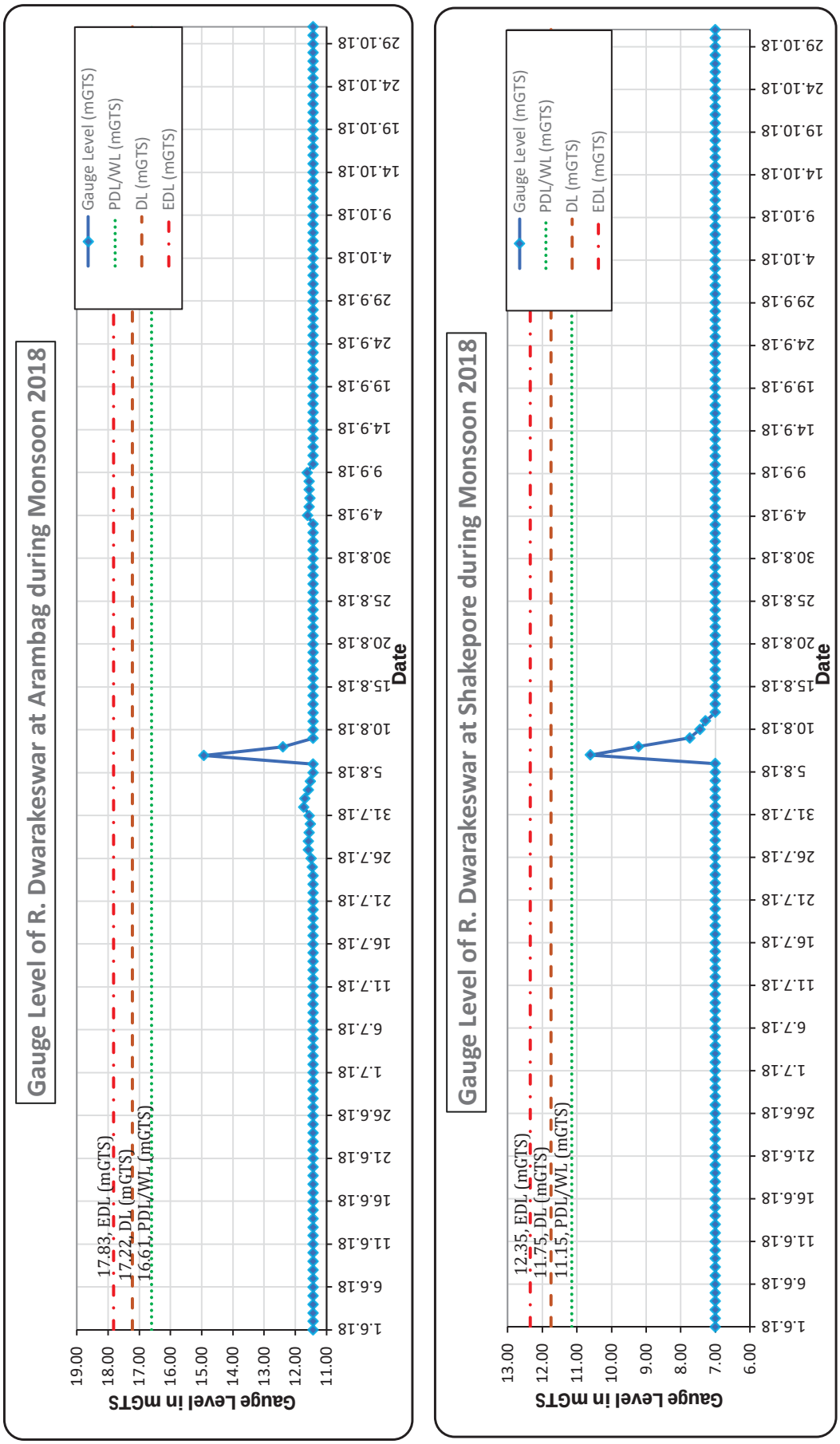

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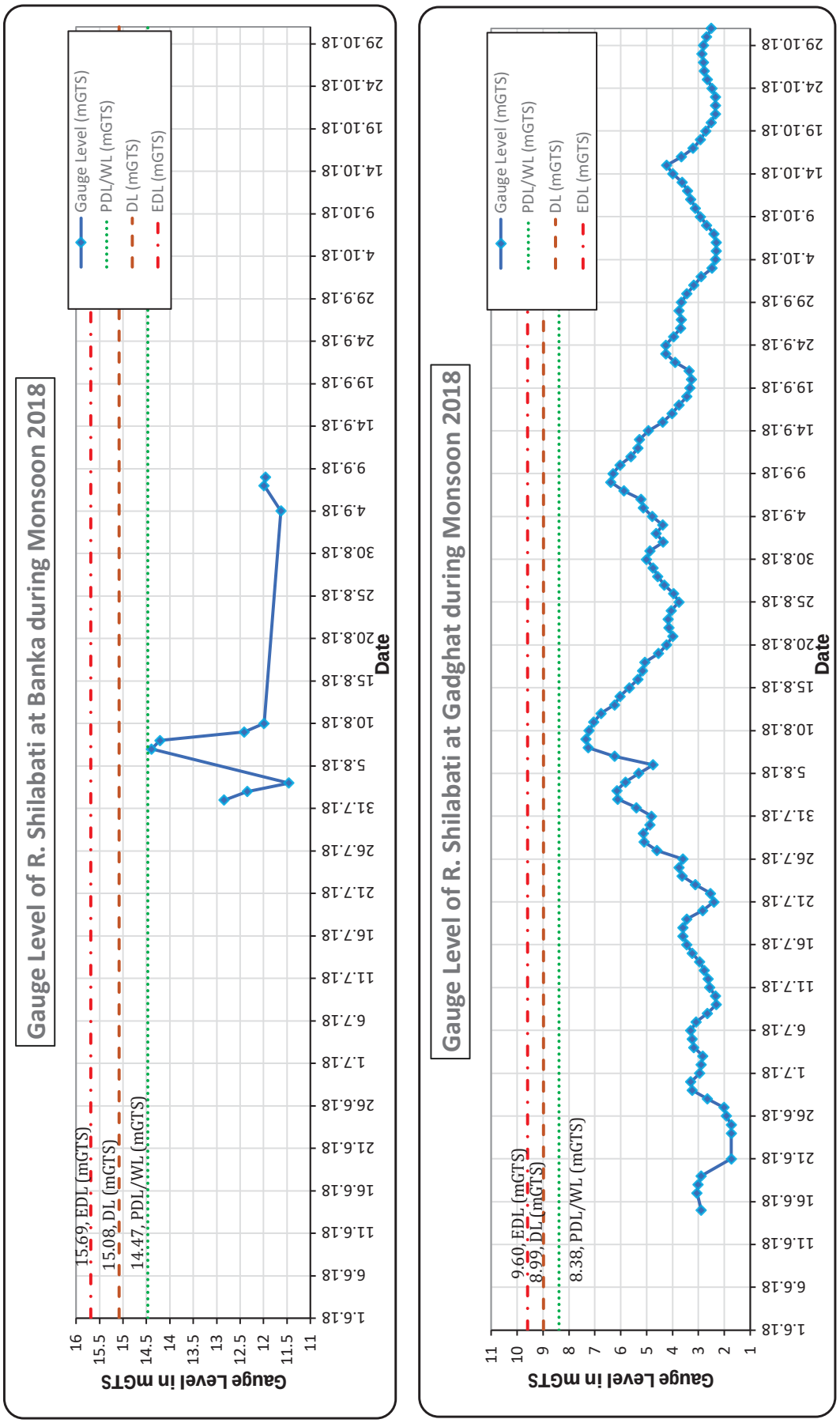

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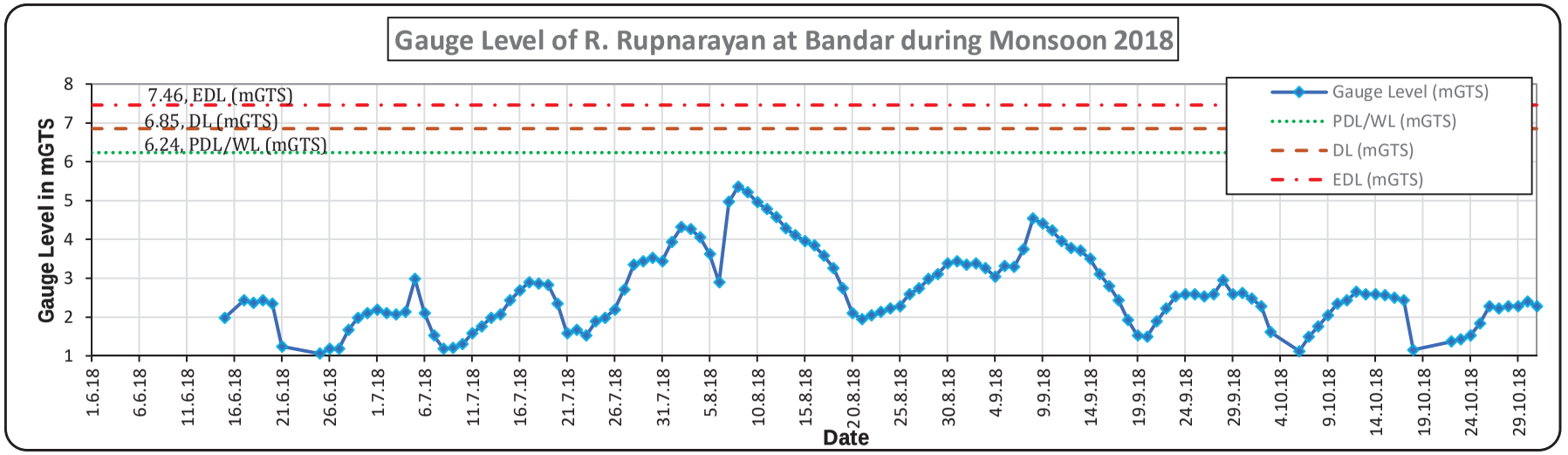

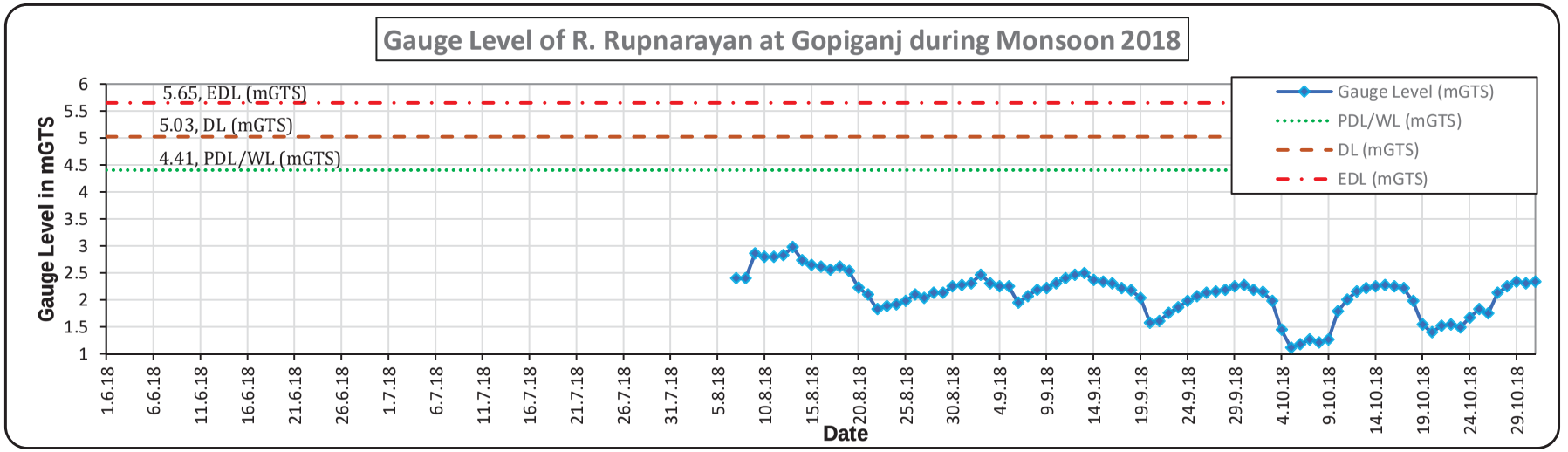

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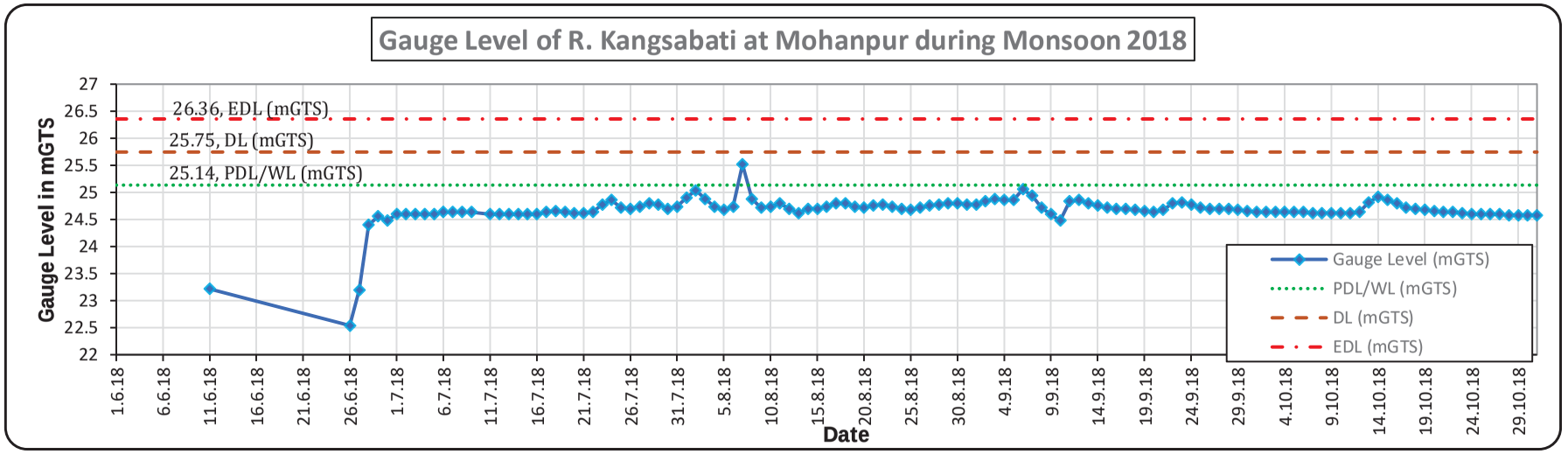

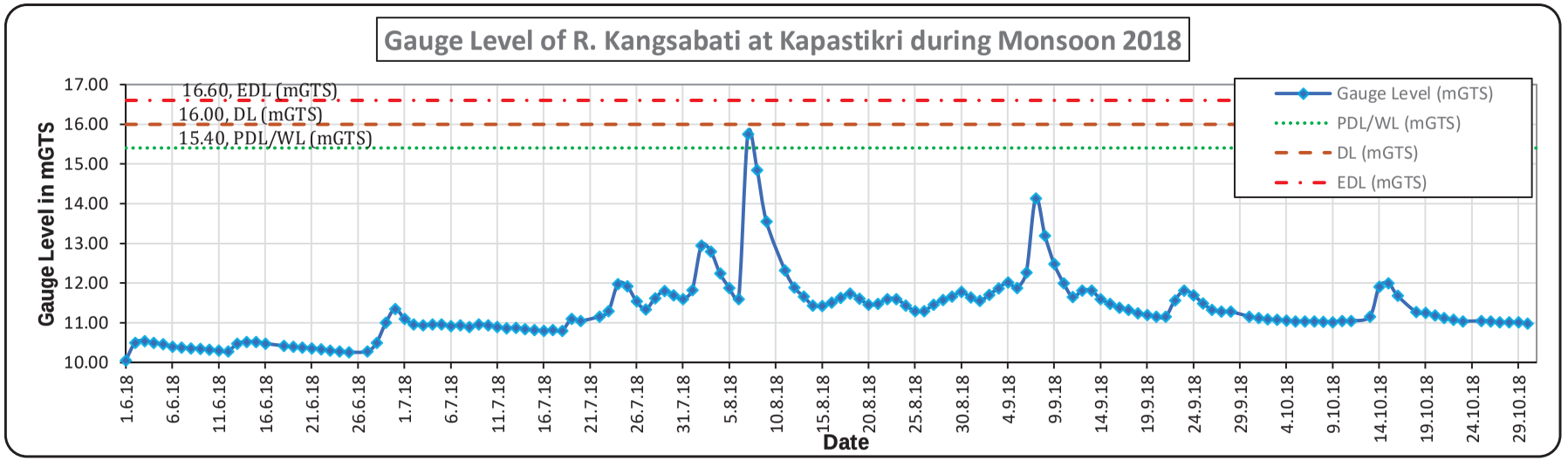

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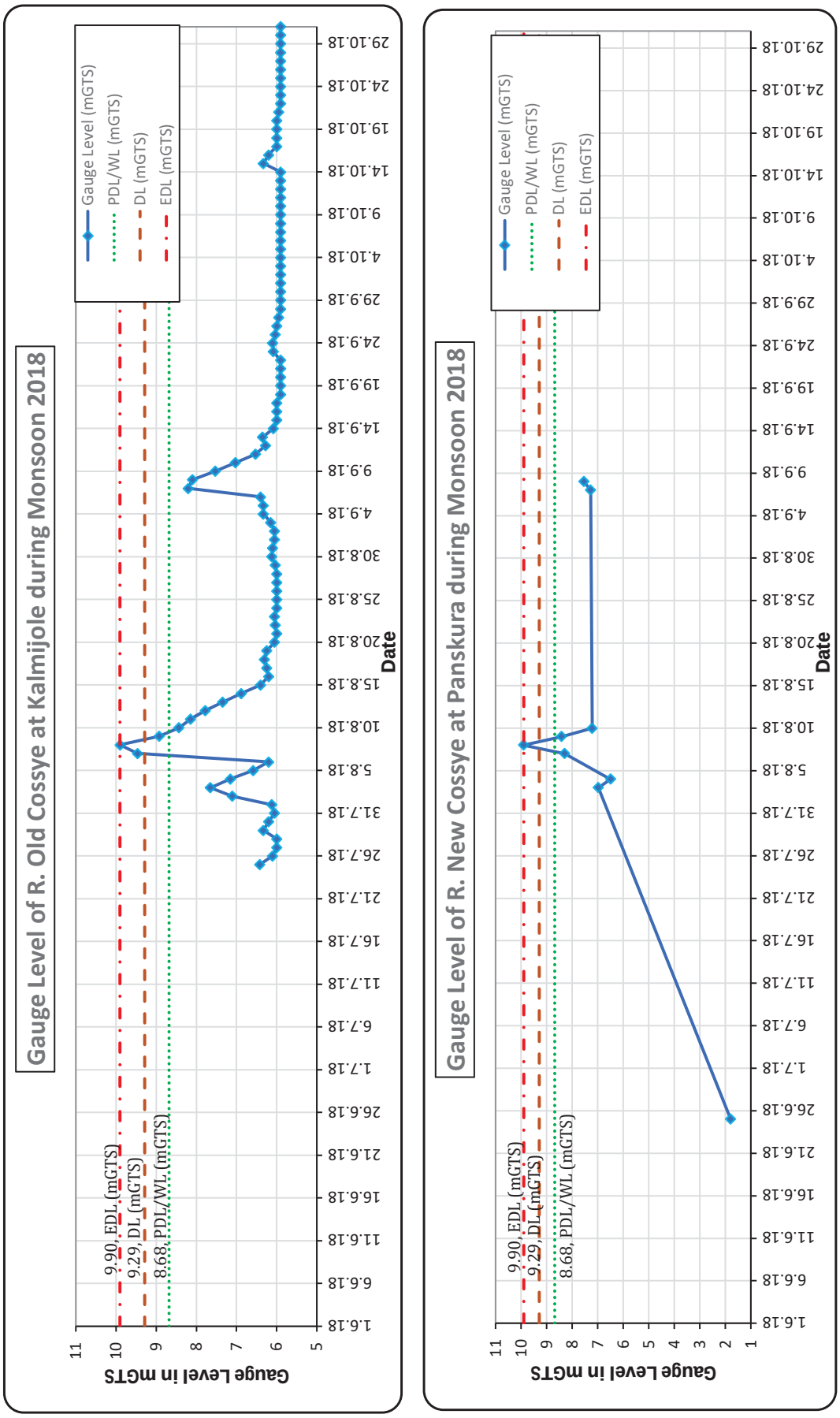

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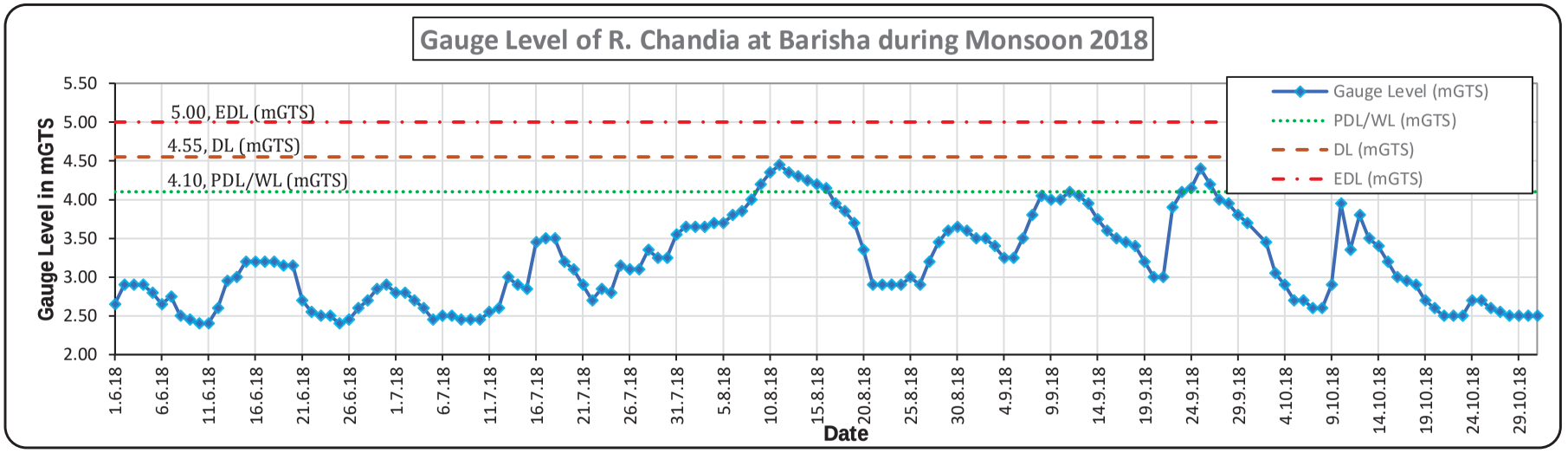

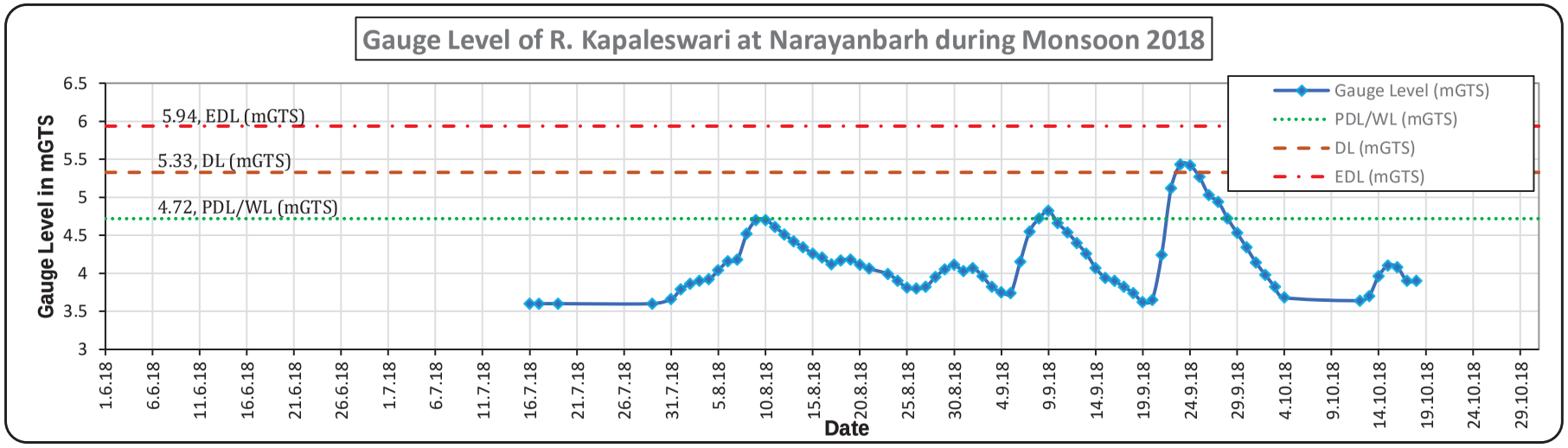

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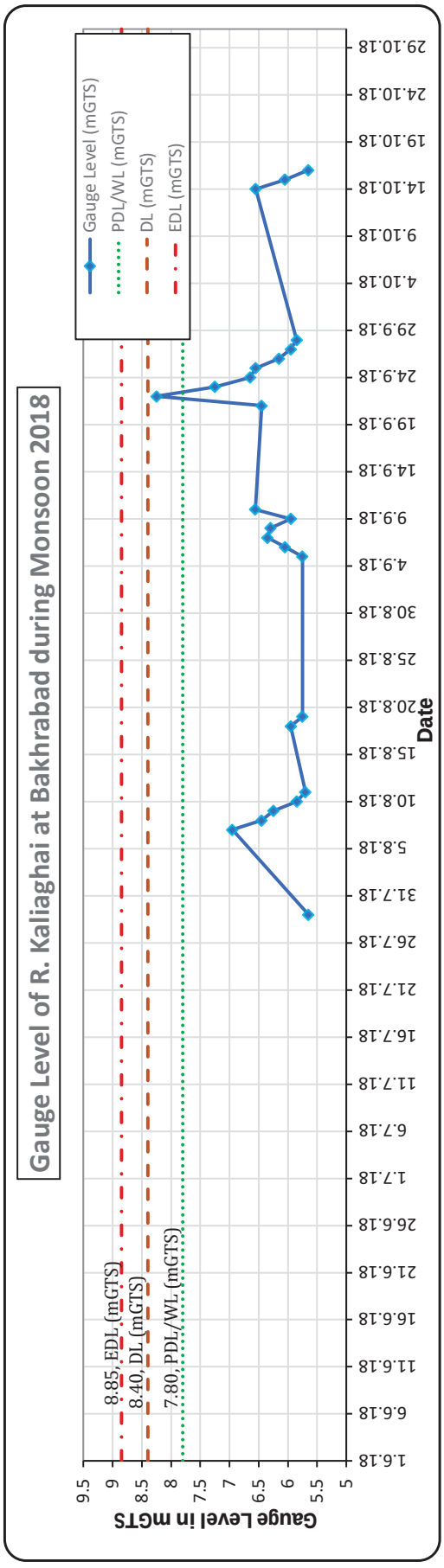

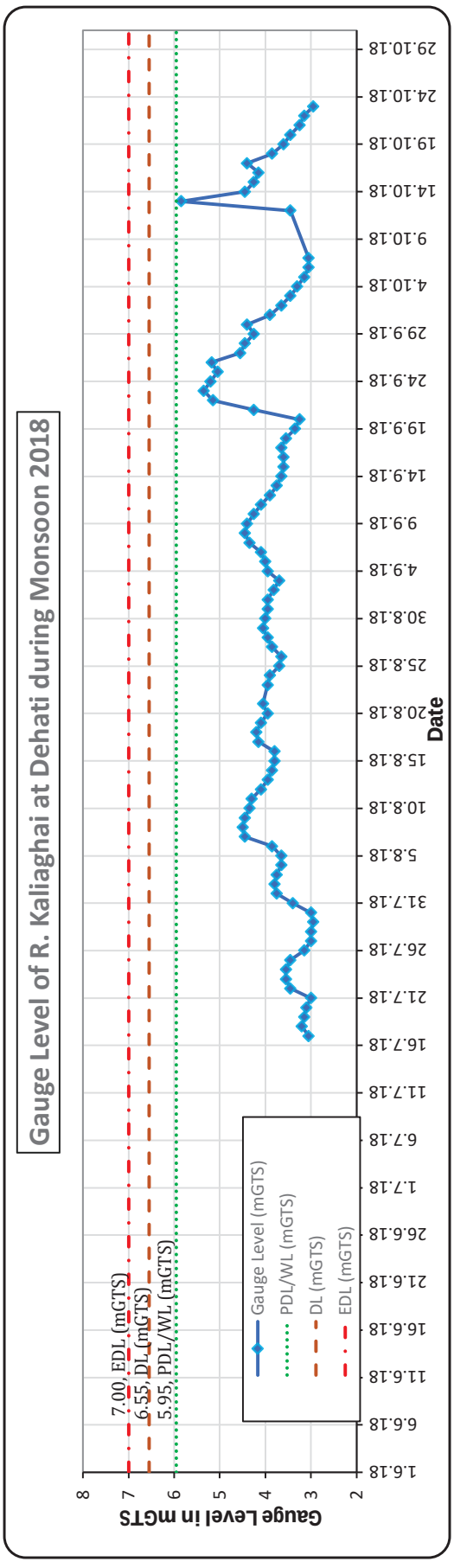

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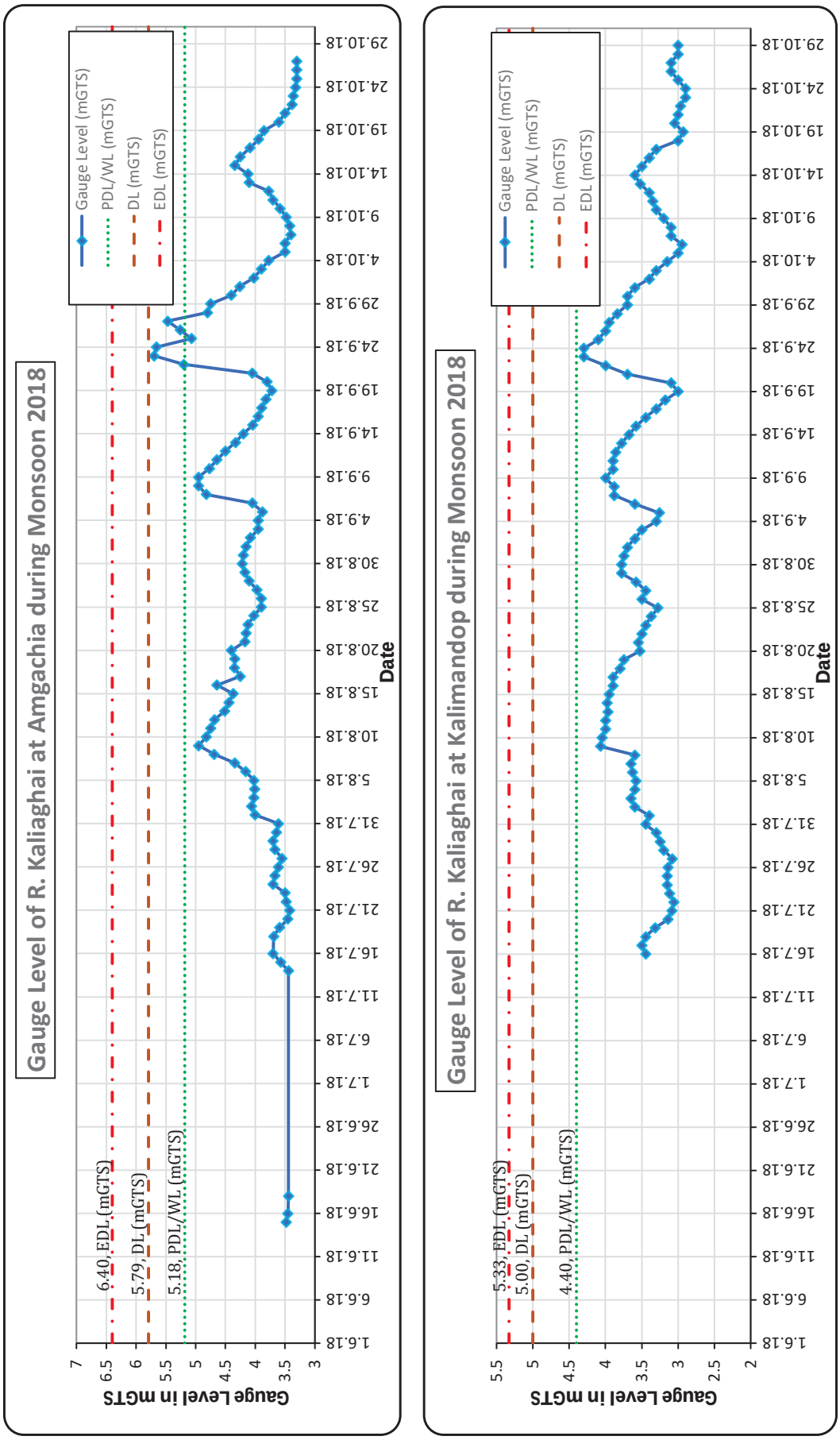

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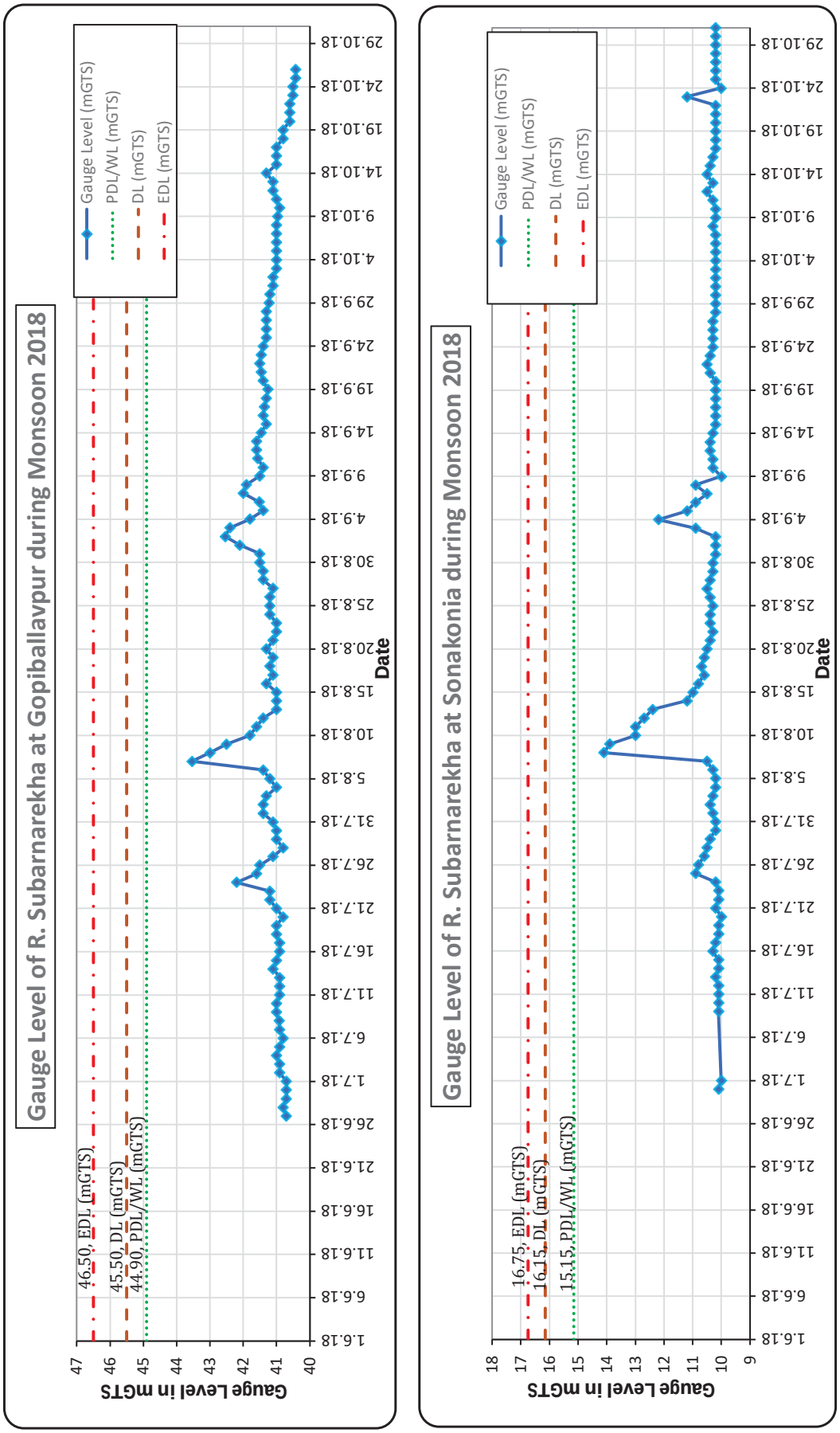


Annexure-VIII: Dam-Barrage Data during June, 2018

DATE	DURGAPUR BARRAGE			MASSANJORE DAM			TILPARA BARRAGE			MUKUTMANIPUR DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Jun-18	211.50	950	450	373.50	188	0	195.00	0	0	419.50	0	0
02-Jun-18	211.50	1,575	1,075	373.50	0	0	190.00	0	0	419.50	NA	NA
03-Jun-18	211.50	1,575	1,075	373.50	0	0	190.00	0	0	419.50	0	0
04-Jun-18	211.50	950	450	373.50	0	0	190.00	NA	NA	419.50	0	0
05-Jun-18	211.50	1,575	1,075	373.50	0	0	190.00	0	0	419.50	0	0
06-Jun-18	211.50	950	450	373.45	0	0	190.00	0	0	419.50	0	0
07-Jun-18	211.50	1,575	1,075	373.45	0	0	190.00	0	0	419.50	0	0
08-Jun-18	211.50	1,125	625	373.45	0	0	190.00	0	0	419.50	0	0
09-Jun-18	211.50	950	450	373.40	0	0	190.00	0	0	419.50	0	0
10-Jun-18	211.50	2,200	1,700	373.40	0	0	190.00	0	0	419.50	0	0
11-Jun-18	211.50	1,575	1,075	373.40	0	0	190.00	0	0	419.50	0	0
12-Jun-18	211.50	1,575	1,075	373.35	0	0	190.00	0	0	419.50	0	0
13-Jun-18	211.50	950	550	373.35	0	0	190.00	0	0	419.50	0	0
14-Jun-18	211.50	1,575	1,075	373.35	0	0	190.00	0	0	419.50	0	0
15-Jun-18	211.50	1,575	1,075	373.30	0	0	190.00	0	0	419.50	0	0
16-Jun-18	211.50	1,575	1,075	373.33	NA	NA	190.48	NA	NA	419.50	0	0
17-Jun-18	211.50	1,125	625	373.05	205	767	190.00	767	767	419.50	0	0
18-Jun-18	211.50	1,575	1,075	372.80	0	720	190.00	720	720	419.50	0	0
19-Jun-18	211.50	1,575	1,075	372.65	260	785	190.00	785	785	419.50	0	0
20-Jun-18	211.50	1,575	1,075	372.55	359	709	190.00	709	709	419.50	0	0
21-Jun-18	211.50	1,575	1,075	372.50	263	438	190.00	438	438	419.50	0	0
22-Jun-18	211.50	2,650	2,150	372.30	59	759	190.00	759	759	419.50	0	0
23-Jun-18	211.50	1,575	1,075	372.10	63	763	190.00	763	763	419.50	0	0
24-Jun-18	211.50	950	450	371.85	0	729	190.00	729	729	419.50	0	0
25-Jun-18	211.50	1,575	1,075	371.75	375	725	190.00	725	725	419.50	0	0
26-Jun-18	211.50	1,575	1,075	371.90	1,342	817	190.00	817	817	419.50	0	0
27-Jun-18	211.50	5,875	5,375	371.80	403	753	190.00	753	753	419.50	0	0
28-Jun-18	211.50	3,725	3,225	371.65	250	775	190.00	775	775	419.50	0	0
29-Jun-18	211.50	5,875	5,375	371.50	251	776	190.00	776	776	419.50	0	0
30-Jun-18	211.50	3,725	3,225	371.30	58	758	190.00	758	758	419.50	0	0

DATE	MITHON DAM			PANCHET DAM			TENUGHAT DAM			CHANDIL DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Jun-18	455.96	NA	NA	396.94	NA	NA	843.88	NA	NA	NA	NA	NA
02-Jun-18	455.80	NA	NA	397.00	NA	NA	843.88	183	183	NA	NA	NA
03-Jun-18	455.60	NA	NA	396.97	NA	NA	843.45	183	183	NA	NA	NA
04-Jun-18	455.40	0	0	397.00	0	0	843.78	0	0	NA	NA	NA
05-Jun-18	455.30	0	0	397.00	0	0	843.42	2,795	2,795	NA	NA	NA
06-Jun-18	455.17	NA	NA	397.15	NA	NA	842.37	NA	NA	NA	NA	NA
07-Jun-18	455.07	NA	NA	397.66	NA	NA	841.62	NA	NA	NA	NA	NA
08-Jun-18	454.98	0	424	398.26	0	0	841.33	0	0	NA	NA	NA
09-Jun-18	455.00	NA	0	399.00	NA	0	840.70	NA	NA	NA	NA	NA
10-Jun-18	454.84	NA	0	400.22	NA	0	841.32	NA	0	NA	NA	NA
11-Jun-18	455.01	NA	0	401.04	NA	0	839.68	NA	2,716	NA	NA	NA
12-Jun-18	455.40	0	0	401.63	2,093	0	839.52	2,714	2,714	NA	NA	NA
13-Jun-18	455.27	0	491	402.16	3,205	0	839.32	0	2,708	NA	NA	NA
14-Jun-18	455.40	1,962	0	402.61	3,303	0	839.00	0	2,701	NA	NA	NA
15-Jun-18	455.67	NA	NA	403.14	NA	NA	838.44	NA	NA	NA	NA	NA
16-Jun-18	455.63	1,374	1,374	403.53	3,466	0	837.65	2	2,651	585.79	NA	665
17-Jun-18	455.50	163	1,144	403.86	1,177	0	836.75	2,631	2,631	585.62	NA	673
18-Jun-18	455.40	0	719	404.19	2,387	0	836.53	2,627	2,627	585.62	NA	673
19-Jun-18	455.37	0	0	404.42	1,213	NA	836.14	0	499	585.66	NA	673
20-Jun-18	455.34	0	0	404.58	1,242	0	835.09	2,595	0	585.62	NA	673
21-Jun-18	455.34	0	0	404.85	3,728	NA	834.50	2,582	2,582	585.62	NA	673
22-Jun-18	455.30	0	0	405.01	1,275	0	833.88	2,570	2,570	585.62	NA	673
23-Jun-18	455.24	NA	NA	405.24	NA	NA	833.55	NA	NA	585.62	NA	673
24-Jun-18	455.21	NA	490	405.17	0	0	833.45	148	148	585.62	NA	673
25-Jun-18	455.44	0	0	405.01	196	2,704	833.45	148	148	585.32	NA	672
26-Jun-18	455.83	4,022	0	405.34	2,550	0	833.45	148	148	585.46	NA	672
27-Jun-18	455.08	0	0	405.47	490	3,074	833.97	2,601	149	585.62	NA	673
28-Jun-18	457.37	4,251	0	405.27	1,439	3,990	834.79	5,154	150	585.62	NA	673
29-Jun-18	457.80	NA	NA	404.78	NA	NA	835.22	NA	NA	585.62	NA	673
30-Jun-18	458.10	0	0	404.78	1,242	0	835.84	5,252	151	585.62	NA	673

DATE	TEESTA BARRAGE			HINGLOW DAM			SIKATIA BARRAGE			EX-GALUDI BARRAGE		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)
01-Jun-18	376.87	13,629	10,531	308	0	0	554.78	NA	NA	NA	NA	NA
02-Jun-18	377.53	16,906	13,715	308.00	0	0	555.37	NA	0	NA	NA	NA
03-Jun-18	377.20	19,165	16,020	308.00	0	0	555.47	NA	NA	NA	NA	NA
04-Jun-18	376.87	17,721	14,624	308.00	0	0	555.07	0	0	NA	NA	NA
05-Jun-18	377.00	13,825	10,680	308.00	0	0	554.69	0	0	NA	NA	NA
06-Jun-18	373.45	15,275	12,178	308.00	0	0	554.88	0	0	NA	NA	NA
07-Jun-18	377.00	15,585	12,440	308.00	0	0	555.14	NA	0	NA	NA	NA
08-Jun-18	377.50	15,791	12,600	308.00	0	0	555.31	0	0	NA	NA	NA
09-Jun-18	376.54	24,431	21,240	308.00	0	0	555.47	NA	0	NA	NA	NA
10-Jun-18	376.21	17,338	14,199	308.00	0	0	555.63	NA	0	NA	NA	NA
11-Jun-18	376.54	19,344	16,153	308.00	0	0	555.51	NA	0	NA	NA	NA
12-Jun-18	376.54	21,974	18,937	308.00	0	0	554.52	NA	0	NA	NA	NA
13-Jun-18	375.23	25,708	22,873	0.00	0	0	555.65	NA	0	NA	NA	NA
14-Jun-18	375.23	25,708	22,873	308.00	0	0	555.11	0	0	NA	NA	NA
15-Jun-18	375.56	38,942	35,913	308.00	0	0	555.31	NA	0	NA	NA	NA
16-Jun-18	374.90	51,477	48,558	308.00	0	0	555.38	NA	NA	279.86	NA	1,041
17-Jun-18	375.23	66,969	63,993	308.00	0	0	555.47	NA	0	280.02	NA	1,312
18-Jun-18	375.56	35,546	32,516	308.00	0	0	555.60	NA	0	280	1,312	1,312
19-Jun-18	375.23	27,325	24,352	308.00	0	0	555.70	NA	0	NA	NA	NA
20-Jun-18	375.23	26,263	23,290	308	0	0	555.64	NA	0	280	NA	1,041
21-Jun-18	375.56	24,529	21,501	308.00	0	0	555.41	NA	600	280	NA	1,041
22-Jun-18	375.56	31,649	28,622	308.00	0	0	554.94	NA	600	280.02	NA	1,312
23-Jun-18	375.56	30,565	27,537	308.00	0	0	554.82	NA	NA	280.00	NA	1,312
24-Jun-18	375.23	28,900	25,928	308.00	0	0	555.02	NA	0	279.85	NA	1,029
25-Jun-18	375.56	36,601	33,573	308.00	0	0	555.24	NA	3,600	280.00	NA	1,749
26-Jun-18	375.56	40,090	37,063	310.00	0	0	555.60	NA	1,500	279.85	NA	1,388
27-Jun-18	375.56	30,188	27,161	310.70	25	0	555.44	NA	3,100	280.02	NA	1,749
28-Jun-18	374.90	43,311	40,394	310.95	0	0	554.78	NA	900	280.02	NA	1,749
29-Jun-18	375.56	37,544	34,517	311.25	0	0	555.57	NA	0	280.02	NA	2,186
30-Jun-18	375.00	64,660	61,633	311.40	0	0	556.00	NA	450	282.80	NA	13,880

Annexure-VIII: Dam-Barrage Data during July, 2018

DATE	DURGAPUR BARRAGE			MASSANJORE DAM			TILPARA BARRAGE			MUKUTMANIPUR DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Jul-18	211.50	1,575	1,075	371.10	56	756	190.00	756	756	419.50	0	0
02-Jul-18	211.50	2,650	2,150	370.90	13	713	190.00	713	713	419.50	0	0
03-Jul-18	211.50	1,575	1,075	370.70	100	800	190.00	800	800	419.50	0	0
04-Jul-18	211.50	1,575	1,075	370.50	28	728	190.00	728	728	419.50	0	0
05-Jul-18	211.50	1,575	1,075	370.30	116	816	190.00	816	816	419.50	0	0
06-Jul-18	211.50	2,650	2,150	370.70	2,175	775	190.00	775	775	419.55	336	0
07-Jul-18	211.50	2,650	2,150	370.75	900	725	190.00	725	725	419.65	672	0
08-Jul-18	211.50	12,775	12,275	370.80	893	718	190.00	718	718	419.75	672	0
09-Jul-18	211.50	3,725	3,225	370.65	231	756	190.00	756	756	419.80	336	0
10-Jul-18	211.50	2,650	2,150	370.45	93	793	190.00	793	793	419.80	0	0
11-Jul-18	211.50	4,800	4,300	370.60	1,284	759	190.00	759	759	419.80	0	0
12-Jul-18	211.50	2,650	2,150	371.05	2,339	764	190.00	764	764	419.85	336	0
13-Jul-18	211.50	3,725	3,225	370.90	225	750	190.00	750	750	419.95	672	0
14-Jul-18	211.50	2,650	2,150	370.75	566	566	190.50	NA	NA	419.95	0	0
15-Jul-18	211.50	1,575	1,075	370.50	39	739	190.50	739	739	420.00	336	0
16-Jul-18	211.50	1,575	1,075	370.25	0	772	190.00	772	772	420.05	467	0
17-Jul-18	211.50	1,575	1,075	369.90	0	764	190.00	764	764	420.05	0	0
18-Jul-18	211.50	1,575	1,075	369.65	107	757	199.00	125	632	420.05	0	0
19-Jul-18	211.50	550	50	369.40	114	864	202.50	1,438	0	420.15	935	0
20-Jul-18	211.50	1,550	1,050	369.20	235	735	204.50	1,194	0	420.55	3,738	0
21-Jul-18	211.50	550	50	369.00	0	545	204.20	392	0	421.00	4,205	0
22-Jul-18	211.50	1,575	1,075	368.90	249	549	204.10	636	0	421.40	3,738	0
23-Jul-18	211.50	1,550	50	368.70	0	591	204.20	764	0	421.80	3,738	0
24-Jul-18	211.50	8,500	50	368.60	226	526	204.50	901	0	421.90	3,808	0
25-Jul-18	211.50	8,650	50	368.50	253	553	204.00	1,036	0	421.60	2,598	0
26-Jul-18	211.50	13,300	2,150	368.60	996	546	205.30	2,035	0	421.25	1,522	0
27-Jul-18	211.50	17,600	8,600	369.15	1,999	499	205.20	2,113	66	420.90	2,714	NA
28-Jul-18	211.50	32,650	23,650	370.10	3,031	0	204.80	1,786	0	420.50	1,293	0
29-Jul-18	211.50	13,300	4,300	370.90	2,950	0	204.30	1,875	0	420.20	2,595	0
30-Jul-18	211.50	14,375	5,375	371.30	1,550	0	203.70	1,329	0	419.95	3,173	0
31-Jul-18	211.50	3,173	3,225	371.85	2,075	0	204.70	2,127	0	419.65	3,333	0

DATE	MITHON DAM			PANCHET DAM			TENUGHAT DAM			CHANDIL DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Jul-18	458.22	0	0	404.71	0	0	836.04	151	151	585.62	0	664
02-Jul-18	458.32	0	0	404.62	0	0	836.24	5,155	152	585.62	NA	639
03-Jul-18	458.68	783	256	404.65	1,658	1,504	836.43	783	151	585.62	NA	664
04-Jul-18	459.27	2,781	256	404.68	1,658	1,504	836.43	151	151	585.62	NA	664
05-Jul-18	459.70	2,116	260	404.19	1,038	1,500	836.89	1,630	151	585.95	NA	666
06-Jul-18	460.09	2,493	755	404.65	2,315	2,007	838.47	5,321	153	586.12	NA	667
07-Jul-18	460.62	4,062	1,707	404.52	4,135	4,755	839.09	2,574	154	586.12	NA	667
08-Jul-18	460.26	0	3,814	403.27	1,907	8,618	839.42	937	155	586.28	NA	669
09-Jul-18	460.36	1,091	503	403.27	1,006	1,006	839.19	1,465	2,247	586.61	NA	671
10-Jul-18	460.36	1,001	503	403.21	1,715	2,002	838.70	1,001	2,659	586.61	NA	671
11-Jul-18	460.29	373	503	403.37	2,724	2,002	838.08	571	2,646	586.61	NA	671
12-Jul-18	460.26	320	466	403.50	2,578	2,002	837.98	346	671	586.60	NA	671
13-Jul-18	460.09	187	543	403.37	1,431	2,002	837.98	153	153	586.44	NA	670
14-Jul-18	460.06	252	252	403.34	357	503	837.94	44	153	586.44	NA	670
15-Jul-18	460.00	252	252	403.34	503	503	837.85	0	153	586.28	NA	669
16-Jul-18	459.93	252	252	403.40	787	503	837.78	0	153	586.28	NA	669
17-Jul-18	459.86	252	252	403.43	645	503	837.68	0	153	586.11	NA	667
18-Jul-18	459.80	110	252	403.50	787	503	837.68	152	152	586.12	NA	667
19-Jul-18	459.77	142	252	403.60	94	503	837.68	153	153	586.28	NA	669
20-Jul-18	459.73	1,297	252	403.83	10,217	0	837.78	473	153	586.28	NA	669
21-Jul-18	459.80	539	252	403.83	503	503	837.88	473	153	586.44	NA	670
22-Jul-18	459.80	253	253	403.86	649	503	837.98	477	153	586.44	NA	670
23-Jul-18	459.50	847	2,124	403.57	1,378	2,688	838.37	1,458	153	586.60	NA	671
24-Jul-18	458.98	596	2,724	402.98	1,739	4,281	839.32	3,348	154	586.60	NA	671
25-Jul-18	458.26	730	3,340	402.61	1,837	3,115	839.88	2,060	155	586.61	NA	671
26-Jul-18	457.57	1,308	4,545	402.42	948	3,139	847.89	71,679	166	586.61	NA	671
27-Jul-18	458.59	6,332	2,120	402.22	4,706	5,513	849.69	13,731	7,006	586.61	NA	671
28-Jul-18	461.90	16,502	1,962	404.19	14,617	6,117	851.59	17,227	8,248	586.94	NA	674
29-Jul-18	464.39	16,275	4,739	406.58	11,638	0	850.74	13,444	17,372	587.10	NA	675
30-Jul-18	465.47	10,069	4,840	409.41	15,623	0	848.74	7,101	16,294	588.25	NA	683
31-Jul-18	467.02	8,159	483	410.92	14,463	5,205	848.38	11,573	13,200	588.74	NA	687

DATE	TEESTA BARRAGE			HINGLOW DAM			SIKATIA BARRAGE			EX-GALUDI BARRAGE		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)
01-Jul-18	374.90	46,899	43,982	311.45	0	0	556.03	NA	450	281.82	0	9,016
02-Jul-18	375.23	34,775	31,800	312.05	0	0	556.00	NA	1,200	280.51	NA	3,733
03-Jul-18	374.90	64,173	64,173	312.40	0	0	555.70	NA	3,600	280.51	NA	3,733
04-Jul-18	375.23	68,027	65,232	312.50	0	0	555.05	NA	3,600	281.49	NA	3,733
05-Jul-18	375.56	81,631	78,778	312.70	0	0	555.34	NA	1,600	293.63	NA	1,097
06-Jul-18	375.23	39,436	36,643	312.95	0	0	555.37	NA	2,400	299.87	NA	5,609
07-Jul-18	375.56	35,063	32,229	313.10	0	0	555.87	NA	NA	300.85	NA	2,890
08-Jul-18	375.56	35,063	32,229	313.15	0	0	554.75	NA	650	301.83	NA	2,971
09-Jul-18	375.56	35,102	32,258	313.20	0	0	555.04	NA	NA	302.16	NA	2,245
10-Jul-18	375.23	53,702	50,910	313.20	0	0	555.80	NA	0	301.83	NA	1,486
11-Jul-18	357.56	41,033	38,189	313.25	0	0	556.19	NA	650	301.83	NA	1,486
12-Jul-18	375.56	53,822	50,978	313.30	0	0	556.43	NA	650	302.48	NA	1,512
13-Jul-18	375.56	53,822	50,978	313.45	0	0	556.16	NA	1,200	302.82	NA	763
14-Jul-18	375.23	39,436	36,643	313.55	0	0	555.47	NA	1,200	302.82	NA	763
15-Jul-18	374.90	43,593	40,855	313.60	0	0	555.14	NA	900	302.82	NA	763
16-Jul-18	375.23	34,565	31,773	313.60	0	0	555.31	NA	0	303.15	NA	769
17-Jul-18	375.24	29,695	26,903	313.65	0	0	555.64	NA	0	303.14	NA	766
18-Jul-18	375.56	30,151	27,307	313.70	0	0	555.71	NA	0	303.15	NA	3,077
19-Jul-18	375.56	27,370	24,525	313.80	0	0	555.77	NA	0	302.82	NA	7,629
20-Jul-18	374.90	29,116	26,378	313.85	0	0	555.96	NA	0	302.82	NA	3,051
21-Jul-18	375.56	27,767	24,923	313.90	0	0	555.90	NA	0	302.82	NA	3,052
22-Jul-18	375.23	32,222	29,430	313.90	0	0	555.96	NA	NA	302.82	NA	6,612
23-Jul-18	375.56	37,669	34,825	313.90	0	0	556.03	NA	NA	302.49	NA	7,562
24-Jul-18	375.56	30,044	27,199	314.00	NA	0	555.90	NA	800	302.49	NA	34,788
25-Jul-18	375.56	50,828	47,984	314.00	0	0	555.70	NA	1,600	303.15	NA	10,770
26-Jul-18	375.56	38,574	38,574	314.05	0	0	555.93	NA	4,500	303.15	NA	9,228
27-Jul-18	375.23	44,191	44,041	315.20	0	0	554.72	NA	1,200	302.82	NA	6,103
28-Jul-18	375.56	37,822	34,818	317.10	0	0	555.50	NA	3,800	303.14	NA	6,156
29-Jul-18	375.23	45,212	42,270	317.60	0	0	555.14	NA	4,200	302.82	NA	6,103
30-Jul-18	375.56	45,904	42,907	318.35	0	0	554.59	NA	1,800	302.82	NA	6,103
31-Jul-18	375.56	51,208	48,211	318.70	0	0	555.96	NA	1,800	303.47	NA	20,176

Annexure-VIII: Dam-Barrage Data during August, 2018

DATE	DURGAPUR BARRAGE			MASSANJORE DAM			TILPARA BARRAGE			MUKUTMANIPUR DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Aug-18	211.50	12,450	6,450	372.10	1,025	0	204.80	1,743	0	419.90	6,686	0
02-Aug-18	211.50	20,550	15,050	372.60	1,900	0	204.30	1,075	0	420.35	9,345	0
03-Aug-18	211.50	20,050	15,050	373.20	2,194	0	204.30	1,000	0	420.55	7,095	0
04-Aug-18	211.50	16,400	12,900	373.50	1,125	0	203.40	449	0	420.15	1,712	0
05-Aug-18	211.50	24,000	21,500	373.75	938	0	202.50	1,046	0	419.75	2,358	0
06-Aug-18	211.50	19,700	17,200	374.10	1,313	0	202.80	384	0	419.55	4,122	0
07-Aug-18	211.50	22,500	21,500	375.60	6,289	514	204.60	1,568	0	420.20	9,223	0
08-Aug-18	211.50	15,400	12,900	376.10	3,013	1,013	204.80	1,866	0	421.00	10,548	0
09-Aug-18	211.50	11,100	8,600	376.30	1,483	586	204.60	1,515	0	421.60	8,020	0
10-Aug-18	211.50	11,650	8,150	376.30	736	586	204.00	1,018	0	422.10	6,713	0
11-Aug-18	211.50	12,325	11,825	376.10	346	996	203.90	1,340	0	422.30	3,914	0
12-Aug-18	211.50	10,875	5,375	375.75	658	2,005	204.00	1,510	0	422.50	3,789	0
13-Aug-18	211.50	12,875	5,375	375.30	480	2,174	204.40	2,273	0	422.50	1,924	0
14-Aug-18	211.50	1,725	3,225	374.90	608	2,033	204.10	2,153	0	422.60	2,861	0
15-Aug-18	211.50	12,800	4,300	374.50	0	2,746	204.40	1,842	0	422.65	2,397	0
16-Aug-18	211.50	8,550	50	374.05	630	2,167	204.10	1,715	0	422.75	2,612	0
17-Aug-18	211.50	9,575	1,075	373.50	299	2,211	204.60	2,319	0	422.95	3,549	0
18-Aug-18	211.50	11,075	1,075	373.10	643	1,993	204.20	2,070	0	423.20	4,024	0
19-Aug-18	211.50	10,050	50	372.90	77	652	203.60	1,202	0	423.20	2,727	0
20-Aug-18	211.50	10,453	10,453	372.85	450	300	204.40	400	400	423.20	2,737	0
21-Aug-18	211.50	10,050	50	372.90	500	0	204.80	528	0	423.00	1,159	0
22-Aug-18	211.50	10,575	1,075	373.15	1,063	0	205.00	528	0	422.85	2,571	0
23-Aug-18	211.50	10,575	1,075	373.50	1,463	0	205.10	473	0	422.60	2,135	0
24-Aug-18	211.50	10,575	1,075	373.90	1,500	0	205.00	1,080	0	422.50	3,945	0
25-Aug-18	211.50	3,550	50	374.25	1,313	0	203.90	730	0	422.10	1,629	0
26-Aug-18	211.50	8,550	50	374.50	938	0	204.70	1,757	0	421.80	2,641	0
27-Aug-18	211.50	13,800	4,300	374.70	750	0	204.20	873	0	421.70	4,515	0
28-Aug-18	211.50	19,800	10,300	374.90	750	0	203.00	436	0	421.55	4,028	0
29-Aug-18	211.50	23,850	19,350	375.20	1,281	0	202.90	487	0	421.45	4,475	0
30-Aug-18	211.50	21,700	17,200	375.35	750	0	204.10	1,027	0	421.30	3,988	0
31-Aug-18	211.50	17,400	12,900	375.80	1,950	0	204.80	897	0	421.20	4,651	0

DATE	MITHON DAM			PANCHET DAM			TENUGHAT DAM			CHANDIL DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Aug-18	468.85	10,008	507	411.83	13,758	7,824	847.59	5,283	6,293	590.87	NA	4,066
02-Aug-18	469.77	7,195	2,299	411.51	9,360	11,504	847.72	2,250	4,103	591.36	NA	4,158
03-Aug-18	470.20	4,451	2,149	411.55	5,910	11,966	847.33	2,159	3,846	591.86	NA	4,247
04-Aug-18	469.87	2,826	4,601	409.51	4,783	11,808	846.90	1,768	3,571	591.20	NA	7,254
05-Aug-18	469.74	4,544	5,250	407.70	2,578	13,879	846.47	1,461	3,224	590.87	NA	7,129
06-Aug-18	469.35	3,097	5,205	406.62	3,924	9,672	846.18	1,842	2,981	590.38	NA	6,939
07-Aug-18	469.64	4,455	2,874	406.49	6,093	6,770	845.98	1,976	2,783	590.05	NA	6,807
08-Aug-18	471.12	1,022	2,047	406.46	6,291	6,291	845.79	1,790	2,592	589.72	N.A	6,674
09-Aug-18	471.81	6,320	2,177	406.49	6,166	6,166	845.79	2,461	2,461	589.40	NA	6,537
10-Aug-18	471.91	3,993	3,417	407.01	8,861	6,129	846.47	3,388	559	589.40	NA	6,537
11-Aug-18	471.68	2,793	4,131	406.81	5,083	6,129	847.00	2,367	170	589.40	NA	3,779
12-Aug-18	471.54	3,365	4,127	406.45	4,260	6,129	847.79	3,536	171	589.40	NA	3,780
13-Aug-18	472.10	3,365	4,139	406.22	4,978	6,141	849.98	10,011	173	589.40	NA	3,779
14-Aug-18	472.04	3,762	4,147	406.58	7,937	6,097	849.82	3,078	3,836	589.39	NA	3,780
15-Aug-18	471.94	1,994	2,554	406.65	6,470	6,129	849.98	5,928	5,170	589.56	NA	3,812
16-Aug-18	472.07	1,776	1,006	406.78	6,910	6,129	849.79	4,195	5,103	589.60	NA	3,812
17-Aug-18	472.10	1,488	1,297	406.88	6,648	6,129	850.08	6,493	5,131	589.56	NA	3,812
18-Aug-18	471.91	1,038	2,193	406.98	6,652	6,129	849.92	4,435	5,193	589.72	NA	3,845
19-Aug-18	471.81	1,565	2,141	407.04	6,478	6,129	849.49	3,108	5,066	589.72	NA	3,845
20-Aug-18	471.71	1,766	1,766	407.08	7,587	6,181	848.87	4,661	4,661	589.72	NA	3,845
21-Aug-18	471.45	677	2,047	407.01	5,781	6,129	848.74	3,939	4,527	589.39	NA	3,779
22-Aug-18	471.22	864	1,922	406.88	5,440	6,129	849.89	7,053	1,844	589.40	NA	3,779
23-Aug-18	470.99	884	2,112	406.55	4,419	6,129	850.74	4,160	175	589.72	NA	3,845
24-Aug-18	470.99	1,999	1,999	406.06	3,681	6,178	851.40	3,309	176	589.89	NA	3,878
25-Aug-18	472.07	9,321	0	406.59	6,868	2,747	852.78	4,104	179	589.89	NA	3,878
26-Aug-18	473.38	8,115	280	407.90	10,665	3,673	853.79	10,611	5,503	589.89	NA	3,878
27-Aug-18	474.27	6,336	900	408.95	16,960	11,018	853.63	28,935	29,766	591.70	NA	4,217
28-Aug-18	475.12	6,393	1,050	411.14	26,393	12,976	852.08	21,312	28,991	592.18	NA	7,615
29-Aug-18	476.30	8,622	1,042	412.10	26,393	17,937	849.89	12,223	22,690	592.51	NA	7,733
30-Aug-18	476.86	5,760	2,108	412.19	15,351	14,694	850.25	7,954	6,284	593.00	NA	7,904
31-Aug-18	476.96	2,765	2,116	411.90	9,984	11,934	850.38	5,920	5,308	593.17	NA	7,959

DATE	TEESTA BARRAGE			HINGLOW DAM			SIKATIA BARRAGE			EX-GALUDI BARRAGE		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)
01-Aug-18	375.56	75,811	72,967	318.90	0	0	554.78	NA	1,200	303.47	NA	3,212
02-Aug-18	375.56	63,987	61,143	319.05	0	0	554.88	NA	2,400	303.47	NA	29,488
03-Aug-18	375.56	45,877	43,033	318.95	0	0	556.36	NA	800	302.82	NA	18,311
04-Aug-18	375.23	40,319	37,527	318.75	0	0	555.14	NA	400	302.82	NA	21,360
05-Aug-18	374.90	39,701	36,962	318.65	0	0	556.26	NA	800	302.82	NA	13,732
06-Aug-18	375.56	44,521	41,676	318.60	0	0	556.16	NA	28,256	303.47	NA	93,122
07-Aug-18	375.56	71,951	69,107	318.90	0	0	555.83	NA	900	301.18	NA	1,28,833
08-Aug-18	375.56	52,146	49,302	318.90	0	0	554.36	N.A	1,200	301.18	N.A	67,586
09-Aug-18	375.56	37,187	34,448	318.90	0	0	555.90	NA	1,200	302.83	NA	59,003
10-Aug-18	375.56	39,715	36,871	318.90	0	0	556.10	NA	1,600	302.82	NA	27,467
11-Aug-18	375.56	42,390	39,545	318.75	0	319	555.83	NA	0	301.83	NA	17,829
12-Aug-18	374.90	37,383	34,645	318.50	0	0	556.62	NA	0	301.83	NA	11,888
13-Aug-18	374.90	61,695	58,956	318.20	0	0	555.44	NA	1,600	302.81	NA	15,257
14-Aug-18	375.56	50,015	47,171	317.95	0	0	555.57	NA	800	302.82	NA	10,681
15-Aug-18	375.56	67,774	64,929	317.80	0	0	555.96	NA	600	302.82	NA	12,206
16-Aug-18	375.56	50,246	47,402	317.60	0	0	555.86	NA	800	302.82	NA	13,732
17-Aug-18	375.56	40,344	37,499	317.50	0	0	555.94	NA	1,200	301.83	NA	11,888
18-Aug-18	375.56	32,321	29,476	317.35	0	0	555.96	NA	0	301.83	NA	11,888
19-Aug-18	375.56	32,321	29,476	317.30	0	0	555.93	NA	0	301.83	NA	10,400
20-Aug-18	375.56	30,069	27,223	317.30	0	0	556.69	NA	0	301.83	NA	7,430
21-Aug-18	375.56	32,321	29,476	317.50	0	0	556.39	NA	600	302.82	NA	13,733
22-Aug-18	375.56	32,321	29,476	318.00	0	0	556.19	NA	NA	301.83	NA	37,639
23-Aug-18	375.56	28,959	26,115	318.20	0	0	556.58	NA	450	302.82	NA	25,941
24-Aug-18	375.23	30,451	27,659	318.30	0	0	556.00	NA	5,600	301.83	NA	11,888
25-Aug-18	375.56	59,374	56,530	318.35	0	0	555.83	NA	1,200	301.83	NA	13,374
26-Aug-18	375.56	37,272	34,428	318.90	0	0	556.55	NA	1,650	303.47	NA	23,280
27-Aug-18	375.56	32,321	29,476	318.65	0	0	556.62	NA	NA	303.47	NA	26,384
28-Aug-18	375.56	47,174	44,330	318.65	0	0	556.52	NA	1,600	302.82	NA	27,463
29-Aug-18	375.56	44,182	41,338	318.70	0	0	556.65	NA	1,200	302.82	NA	28,992
30-Aug-18	375.23	41,057	38,265	318.50	0	0	555.70	NA	3,600	301.18	NA	38,898
31-Aug-18	375.56	48,154	45,310	318.70	0	0	556.00	NA	0	302	NA	42,095

Annexure-VIII: Dam-Barrage Data during September, 2018

DATE	DURGAPUR BARRAGE			MASSANJORE DAM			TILPARA BARRAGE			MUKUTMANIPUR DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Sep-18	211.50	23,850	19,350	376.50	2,950	0	205.80	1,666	0	421.15	5,106	0
02-Sep-18	211.50	26,000	21,500	376.85	1,527	0	204.30	785	0	421.00	4,039	0
03-Sep-18	211.50	29,300	25,800	377.40	2,500	0	204.10	2,369	0	420.85	4,009	0
04-Sep-18	211.50	27,150	23,650	377.70	1,450	0	203.80	2,216	0	420.75	4,455	0
05-Sep-18	211.50	28,300	25,800	378.30	2,800	0	204.50	2,439	0	420.70	4,910	0
06-Sep-18	211.50	39,050	36,550	378.95	3,025	0	204.60	1,064	0	421.45	12,205	0
07-Sep-18	211.50	39,900	34,400	379.70	3,600	0	204.20	2,588	918	422.80	17,586	0
08-Sep-18	211.50	37,250	32,250	380.20	2,425	0	203.70	1,494	601	423.50	11,234	0
09-Sep-18	211.50	25,000	21,500	380.75	2,663	0	205.60	2,521	68	423.85	8,023	0
10-Sep-18	211.50	21,550	15,050	381.00	1,238	0	204.50	875	429	424.00	6,182	0
11-Sep-18	211.50	21,475	13,975	381.15	725	0	203.80	793	32	424.15	5,550	0
12-Sep-18	211.50	20,400	12,900	381.40	1,175	0	203.80	1,200	0	424.20	3,597	0
13-Sep-18	211.50	24,700	17,200	381.50	500	0	203.40	960	0	424.40	5,008	0
14-Sep-18	211.50	17,100	8,600	381.60	500	0	202.50	564	0	424.40	3,145	0
15-Sep-18	211.50	13,800	4,300	381.70	500	0	203.10	835	0	424.35	2,677	0
16-Sep-18	211.50	13,800	4,300	381.85	792	0	204.00	974	0	424.35	3,142	0
17-Sep-18	211.50	11,025	1,525	381.90	375	0	204.10	797	0	424.40	3,611	0
18-Sep-18	211.50	9,550	50	381.90	150	0	203.30	416	0	424.50	4,084	0
19-Sep-18	211.50	9,550	50	381.90	501	351	202.60	430	0	424.50	3,153	0
20-Sep-18	211.50	9,950	450	381.60	337	1,537	203.80	1,217	0	424.50	3,358	0
21-Sep-18	211.50	10,450	450	381.20	0	963	204.70	2,059	0	424.50	2,676	0
22-Sep-18	211.50	10,450	450	381.00	810	1,560	205.20	2,460	0	424.50	2,567	0
23-Sep-18	211.50	10,050	50	380.80	697	1,497	205.00	2,360	0	424.50	2,567	0
24-Sep-18	211.50	8,550	50	380.45	0	1,497	204.50	2,819	0	424.45	2,099	0
25-Sep-18	211.50	2,550	50	380.20	445	1,482	204.10	1,958	0	424.40	2,096	0
26-Sep-18	211.50	2,050	50	379.90	242	1,517	203.50	1,836	0	424.30	1,623	0
27-Sep-18	211.50	1,300	50	379.55	285	1,797	203.70	2,620	0	424.15	2,249	0
28-Sep-18	211.50	1,300	50	379.20	286	1,798	203.80	2,260	0	423.75	1,599	0
29-Sep-18	211.50	1,300	50	378.85	311	1,786	203.70	2,140	0	423.30	1,311	0
30-Sep-18	211.50	800	50	378.50	374	1,799	203.70	2,200	0	422.90	2,044	0

DATE	MITHON DAM			PANCHET DAM			TENUGHAT DAM			CHANDIL DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Sep-18	477.68	6,891	2,084	410.65	8,699	11,934	851.23	9,557	5,507	593.17	NA	7,960
02-Sep-18	478.24	5,829	2,064	409.08	9,636	19,178	852.02	9,673	5,858	593.33	43,356	8,015
03-Sep-18	479.32	9,481	2,149	408.52	14,041	17,252	854.02	16,482	6,477	593.34	91,788	8,014
04-Sep-18	480.37	10,446	4,000	408.42	14,565	20,000	852.28	12,352	21,059	593.66	500	8,126
05-Sep-18	480.70	6,932	4,508	409.37	24,273	18,768	852.38	24,132	23,646	594.00	960	8,235
06-Sep-18	481.29	10,402	5,983	410.13	27,025	20,264	851.53	15,753	19,916	594.15	NA	15,853
07-Sep-18	481.75	9,445	5,959	411.24	27,025	20,029	850.28	12,499	18,429	593.99	0	15,747
08-Sep-18	482.24	9,250	5,470	411.60	22,372	20,033	849.98	15,913	17,279	594.15	4,265	15,853
09-Sep-18	482.08	4,597	5,862	412.19	19,185	15,298	851.20	13,012	7,292	594.31	17,540	15,957
10-Sep-18	482.08	4,102	4,102	411.57	9,968	14,074	851.79	8,699	5,857	593.82	6,153	15,637
11-Sep-18	482.21	5,217	4,208	411.08	8,456	11,630	852.77	10,916	6,064	593.33	24,700	15,313
12-Sep-18	482.63	7,576	4,265	410.78	9,279	10,426	852.97	18,604	17,623	593.33	5,008	8,014
13-Sep-18	482.57	4,265	4,775	411.51	17,540	12,919	850.02	6,153	20,852	593.17	NA	7,960
14-Sep-18	482.17	2,226	5,176	411.77	11,050	8,476	850.25	4,494	2,974	593.00	NA	7,904
15-Sep-18	481.98	2,120	3,636	412.33	8,987	6,154	850.58	1,716	175	593.00	NA	7,902
16-Sep-18	481.85	1,277	2,282	412.26	5,821	6,259	851.23	3,297	176	593.00	NA	7,902
17-Sep-18	481.69	1,358	1,358	411.93	4,078	6,259	851.69	2,390	176	593.00	NA	7,904
18-Sep-18	481.75	831	1,342	411.44	3,044	6,263	852.02	1,778	177	593.00	NA	7,902
19-Sep-18	481.65	839	1,338	410.82	2,189	6,178	852.28	1,470	177	592.51	NA	713
20-Sep-18	481.58	997	1,334	410.16	2,092	6,178	852.48	1,150	177	592.84	NA	715
21-Sep-18	481.49	900	1,423	409.54	2,450	6,226	852.67	1,150	177	593.00	NA	716
22-Sep-18	481.42	1,070	1,419	408.98	3,032	6,312	853.04	1,978	178	593.33	NA	718
23-Sep-18	481.32	876	1,387	408.42	3,130	6,332	853.33	1,658	178	593.70	NA	720
24-Sep-18	481.26	1,026	1,370	407.70	2,218	6,226	853.20	2,161	2,822	593.82	NA	721
25-Sep-18	481.26	248	248	408.22	3,405	503	852.88	1,667	3,304	596.45	NA	724
26-Sep-18	481.29	503	256	408.82	3,859	503	852.54	1,612	3,242	594.31	NA	725
27-Sep-18	481.29	252	252	409.31	3,381	507	852.15	1,225	3,167	594.48	NA	726
28-Sep-18	481.29	251	251	409.80	3,450	507	852.08	1,488	1,403	594.64	NA	727
29-Sep-18	481.29	251	251	410.06	2,100	507	852.18	660	177	594.45	NA	727
30-Sep-18	481.26	248	248	410.13	908	507	852.25	502	177	594.81	NA	2,766

DATE	TEESTA BARRAGE			HINGLOW DAM			SIKATIA BARRAGE			EX-GALUDI BARRAGE		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)
01-Sep-18	375.56	35,452	32,607	319.00	0	0	556.16	NA	1,600	301.83	NA	77,270
02-Sep-18	375.56	71,177	68,333	319.00	0	0	556.22	NA	800	301.17	NA	61,751
03-Sep-18	374.90	45,669	42,931	318.70	0	3,883	555.64	NA	3,600	301.84	NA	55,962
04-Sep-18	375.56	31,480	28,636	318.70	0	0	555.57	NA	4,000	301.83	NA	26,747
05-Sep-18	375.56	37,272	34,428	318.50	0	0	555.70	NA	4,000	301.83	NA	20,803
06-Sep-18	378.95	32,321	29,476	318.00	0	3,507	555.44	NA	4,000	301.83	NA	55,971
07-Sep-18	375.89	44,809	41,913	316.80	0	0	556.06	NA	2,400	301.18	NA	52,999
08-Sep-18	375.56	33,300	30,456	318.10	0	3,561	556.36	NA	3,000	301.83	NA	90,438
09-Sep-18	375.56	27,370	24,525	316.60	0	0	555.54	NA	800	301.83	NA	43,579
10-Sep-18	375.88	75,958	73,061	317.50	0	0	556.10	NA	1,200	301.83	NA	26,743
11-Sep-18	375.88	59,901	57,004	318.00	0	0	556.52	NA	1,200	302.82	NA	30,519
12-Sep-18	375.56	54,085	51,240	318.50	0	0	556.46	NA	2,400	301.83	NA	23,878
13-Sep-18	374.90	91,788	89,049	318.60	0	0	556.10	NA	800	301.83	NA	16,345
14-Sep-18	375.23	7,54,049	72,613	318.60	0	0	555.90	NA	800	302.82	NA	13,733
15-Sep-18	375.88	75,958	73,061	318.60	0	0	555.44	NA	0	302.82	NA	15,257
16-Sep-18	375.23	52,628	49,836	318.70	0	0	555.93	NA	0	302.82	NA	13,732
17-Sep-18	375.56	32,321	29,476	318.75	0	0	556.29	NA	0	301.83	NA	28,233
18-Sep-18	375.23	26,947	24,155	318.80	0	0	556.49	NA	0	301.83	NA	20,800
19-Sep-18	375.56	27,370	24,525	318.65	0	0	556.59	NA	0	301.83	NA	14,859
20-Sep-18	375.56	20,141	17,297	318.60	0	0	556.52	NA	0	302.82	NA	7,629
21-Sep-18	375.56	17,467	14,623	318.60	0	0	556.46	NA	0	301.83	NA	7,429
22-Sep-18	375.56	20,141	17,297	318.00	0	0	556.69	NA	450	301.83	NA	36,648
23-Sep-18	375.23	19,844	17,052	318.40	0	0	556.52	NA	450	302.84	NA	20,343
24-Sep-18	375.89	16,619	13,722	318.60	0	0	556.49	NA	300	301.83	NA	10,400
25-Sep-18	375.88	22,616	19,719	318.50	0	0	556.10	NA	300	301.83	NA	8,914
26-Sep-18	375.23	21,016	18,223	318.50	0	0	556.96	NA	0	302.81	NA	7,632
27-Sep-18	375.56	32,243	29,396	318.70	0	0	556.00	NA	0	302.82	NA	9,154
28-Sep-18	375.88	17,725	14,829	318.80	0	0	556.06	NA	0	301.83	NA	4,457
29-Sep-18	375.56	17,461	14,623	318.70	NA	0	555.87	NA	0	302.82	NA	6,104
30-Sep-18	375.56	17,467	14,623	318.60	0	0	555.57	NA	0	301.83	NA	4,457

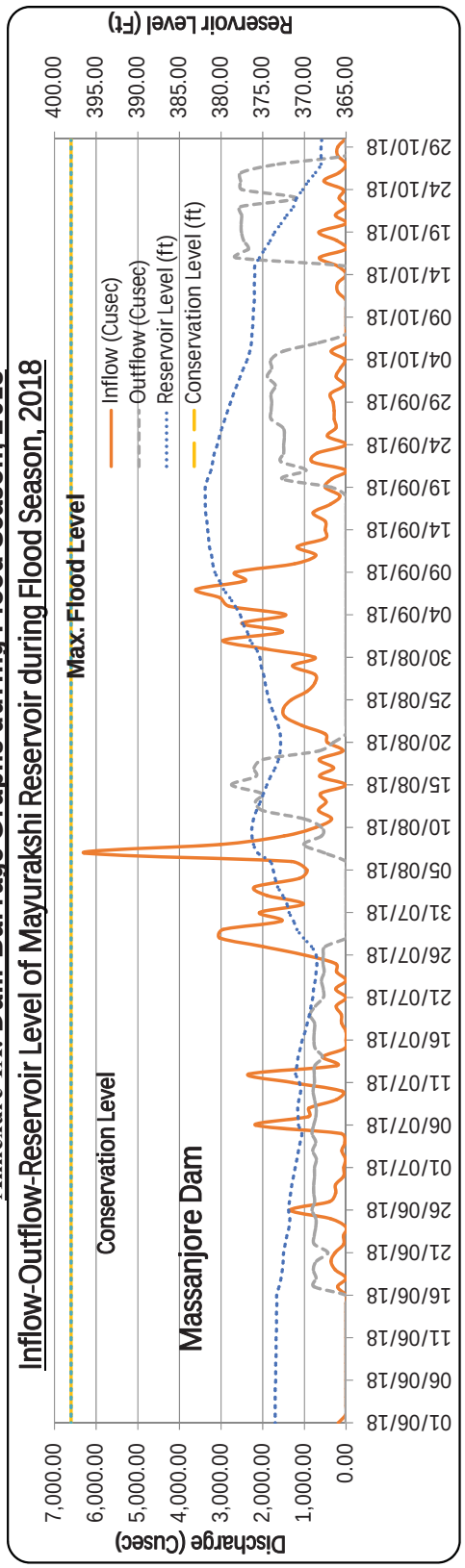
Annexure-VIII: Dam-Barrage Data during October, 2018

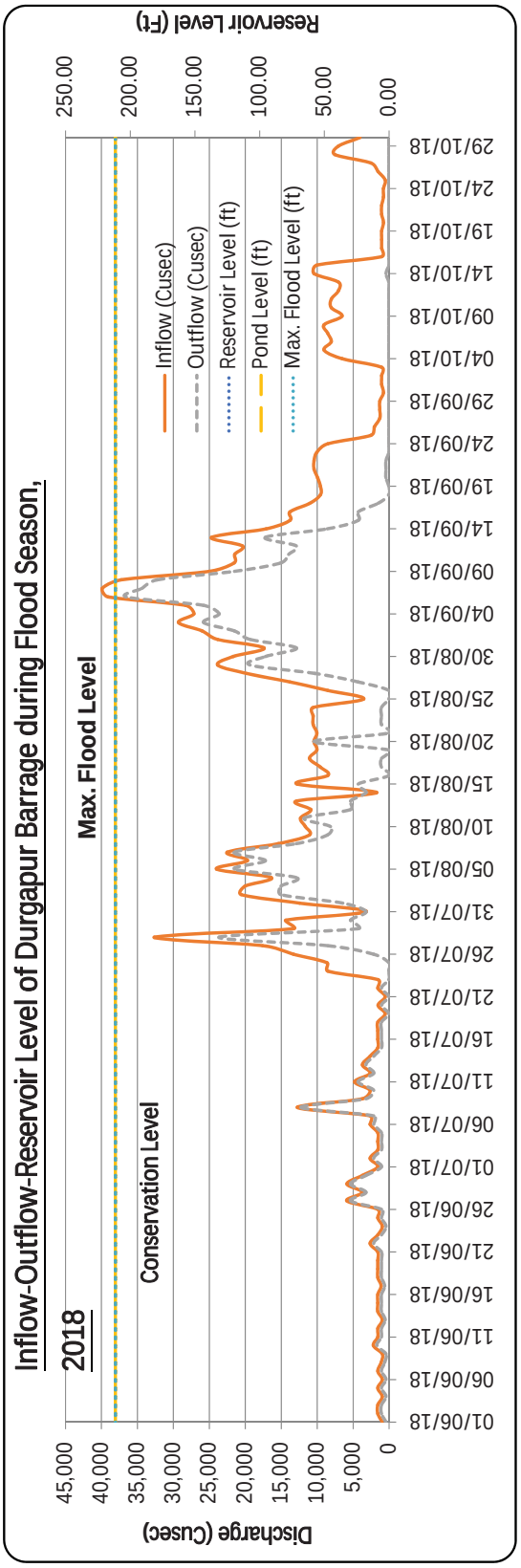
DATE	DURGAPUR BARRAGE			MASSANJORE DAM			TILPARA BARRAGE			MUKUTMANIPUR DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Oct-18	211.50	1,050	50	378.10	47	1,697	203.70	1,816	0	422.50	2,001	0
02-Oct-18	211.50	1,050	50	377.70	237	1,887	204.10	2,044	0	422.00	992	0
03-Oct-18	211.50	1,050	50	377.30	135	1,785	203.80	1,615	0	421.50	1,113	0
04-Oct-18	211.50	6,550	50	376.85	35	1,802	203.90	1,777	0	421.00	1,026	0
05-Oct-18	211.50	9,050	50	376.55	357	1,507	204.60	1,918	0	420.45	766	0
06-Oct-18	211.50	8,050	50	376.35	0	653	204.70	1,364	0	420.00	1,859	0
07-Oct-18	211.50	8,550	50	376.30	0	0	203.80	219	0	419.25	1,101	0
08-Oct-18	211.50	9,050	50	376.20	0	0	203.90	60	0	418.55	1,367	0
09-Oct-18	211.50	6,550	50	376.15	0	0	204.10	124	0	417.85	1,390	0
10-Oct-18	211.50	8,050	50	376.10	0	0	204.20	64	0	417.15	1,462	0
11-Oct-18	211.50	8,050	50	376.00	0	0	204.40	124	0	416.50	1,772	0
12-Oct-18	211.50	7,050	50	376.00	200	0	204.60	128	0	415.95	2,410	0
13-Oct-18	211.50	7,050	50	376.00	200	0	205.00	258	0	415.45	2,543	0
14-Oct-18	211.50	10,450	450	375.95	0	0	205.60	435	0	414.95	2,180	0
15-Oct-18	211.50	10,050	50	375.95	200	0	205.10	0	0	414.45	2,026	0
16-Oct-18	211.50	1,050	50	375.40	639	2,639	205.70	1,468	0	413.75	896	0
17-Oct-18	211.50	1,050	50	374.75	9	2,346	205.10	2,165	0	413.85	1,887	0
18-Oct-18	211.50	1,050	50	374.10	220	2,457	205.20	2,673	0	413.90	336	0
19-Oct-18	211.50	1,050	50	373.55	651	2,513	205.50	2,818	0	413.90	0	0
20-Oct-18	211.50	800	50	372.80	0	2,517	205.60	2,673	0	413.95	336	0
21-Oct-18	211.50	1,050	50	372.10	254	2,504	205.70	2,673	0	414.00	336	0
22-Oct-18	211.50	1,050	50	371.30	0	2,532	205.60	2,528	0	414.05	336	0
23-Oct-18	211.50	800	50	370.95	166	1,191	204.60	1,910	0	414.10	336	0
24-Oct-18	211.50	800	50	370.20	71	2,496	203.80	2,097	0	414.10	0	0
25-Oct-18	211.50	550	50	369.50	530	2,530	204.30	2,637	0	414.15	336	0
26-Oct-18	211.50	1,550	50	368.65	164	2,514	205.50	2,622	0	414.20	336	0
27-Oct-18	211.50	2,550	50	368.00	0	1,632	206.00	2,163	0	414.25	336	0
28-Oct-18	211.50	7,550	50	368.00	200	0	204.10	501	0	414.25	0	0
29-Oct-18	211.50	7,050	50	368.00	200	0	203.00	63	0	414.30	336	0
30-Oct-18	211.50	4,050	50	367.90	0	0	203.50	300	0	414.30	0	0
31-Oct-18	211.50	1,050	50	367.85	50	0	203.60	60	0	414.30	0	0

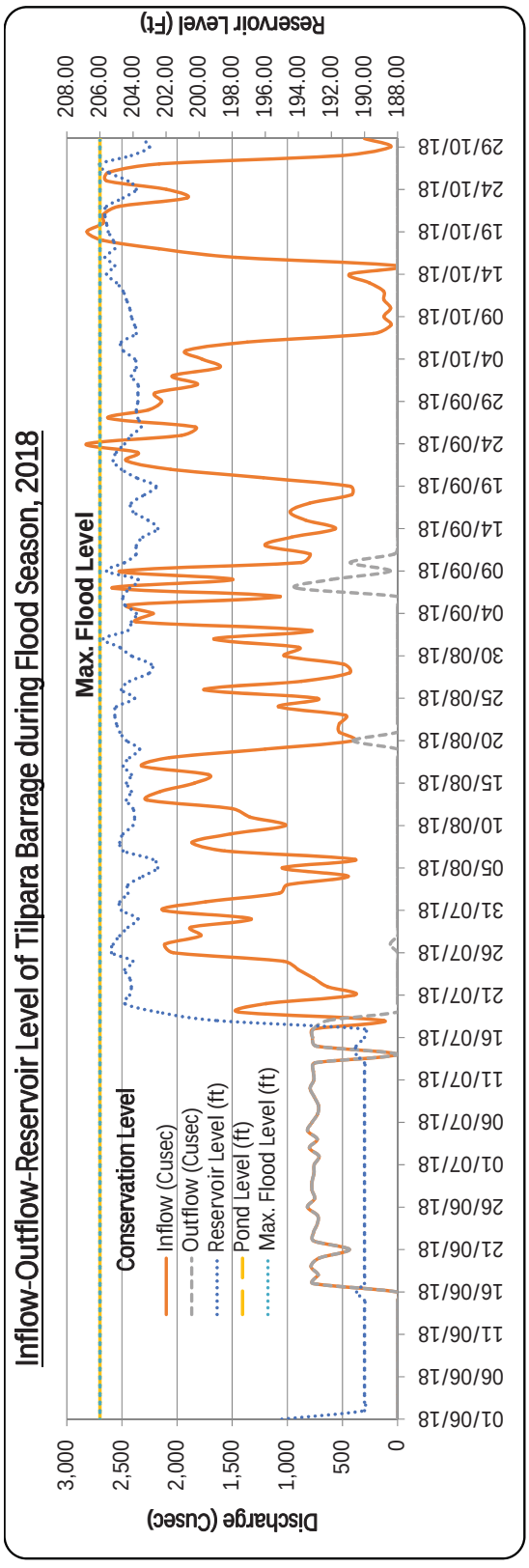
DATE	MITHON DAM			PANCHET DAM			TENUGHAT DAM			CHANDIL DAM		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUSEC)
01-Oct-18	481.22	174	239	410.19	908	503	852.35	660	177	594.48	NA	2,739
02-Oct-18	481.12	110	256	410.19	503	503	852.38	339	177	594.48	NA	2,739
03-Oct-18	481.06	114	256	410.23	710	507	852.45	502	177	594.32	NA	2,726
04-Oct-18	480.70	1,127	3,239	409.77	1,285	4,086	852.48	339	177	594.15	NA	2,712
05-Oct-18	480.24	442	3,142	409.24	697	3,815	852.54	502	177	593.99	NA	2,699
06-Oct-18	479.81	766	3,073	408.72	714	3,762	852.54	177	177	593.82	NA	721
07-Oct-18	479.32	377	3,762	408.20	373	3,162	852.54	177	177	593.82	NA	721
08-Oct-18	478.79	284	3,916	407.70	138	3,044	852.54	177	177	593.66	NA	721
09-Oct-18	478.27	418	4,005	407.27	706	3,008	852.54	177	177	593.50	NA	720
10-Oct-18	477.68	564	4,090	406.81	653	3,081	852.48	0	177	593.50	NA	719
11-Oct-18	477.09	503	4,224	406.35	722	3,089	852.45	15	177	593.50	NA	719
12-Oct-18	476.24	300	5,574	406.26	503	1,006	852.38	0	177	593.33	NA	718
13-Oct-18	475.52	1,208	5,858	406.26	1,006	1,006	852.38	177	177	593.33	NA	718
14-Oct-18	474.76	1,362	5,987	405.93	1,451	3,105	852.48	664	177	593.33	NA	718
15-Oct-18	473.91	799	5,987	405.90	823	989	852.48	177	177	593.33	NA	718
16-Oct-18	473.87	843	499	406.03	916	252	852.54	502	177	NA	NA	NA
17-Oct-18	473.78	316	499	406.16	916	251	852.54	177	177	NA	NA	NA
18-Oct-18	473.74	503	503	406.22	584	252	852.58	339	177	NA	NA	NA
19-Oct-18	473.68	503	503	406.29	584	252	852.64	502	177	NA	NA	NA
20-Oct-18	473.55	316	754	406.39	750	202	852.65	177	177	NA	NA	NA
21-Oct-18	473.45	479	503	406.43	418	252	852.65	177	177	NA	NA	NA
22-Oct-18	473.35	410	503	406.46	418	252	852.64	177	177	NA	NA	NA
23-Oct-18	473.25	304	203	406.52	592	256	852.64	177	177	NA	NA	NA
24-Oct-18	473.16	308	507	406.56	426	256	852.58	0	177	NA	NA	NA
25-Oct-18	473.02	304	503	406.59	426	255	852.58	177	177	NA	NA	NA
26-Oct-18	472.34	884	4,167	406.52	661	1,001	852.55	15	177	NA	NA	NA
27-Oct-18	471.42	438	5,464	406.43	158	1,001	852.55	177	177	NA	NA	NA
28-Oct-18	470.20	312	6,287	406.32	503	1,001	852.48	0	177	NA	NA	NA
29-Oct-18	469.08	470	6,121	406.22	507	1,006	852.45	15	177	NA	NA	NA
30-Oct-18	468.96	0	507	406.23	251	252	852.38	0	0	NA	NA	NA
31-Oct-18	468.86	69	503	406.26	418	251	852.35	15	177	NA	NA	NA

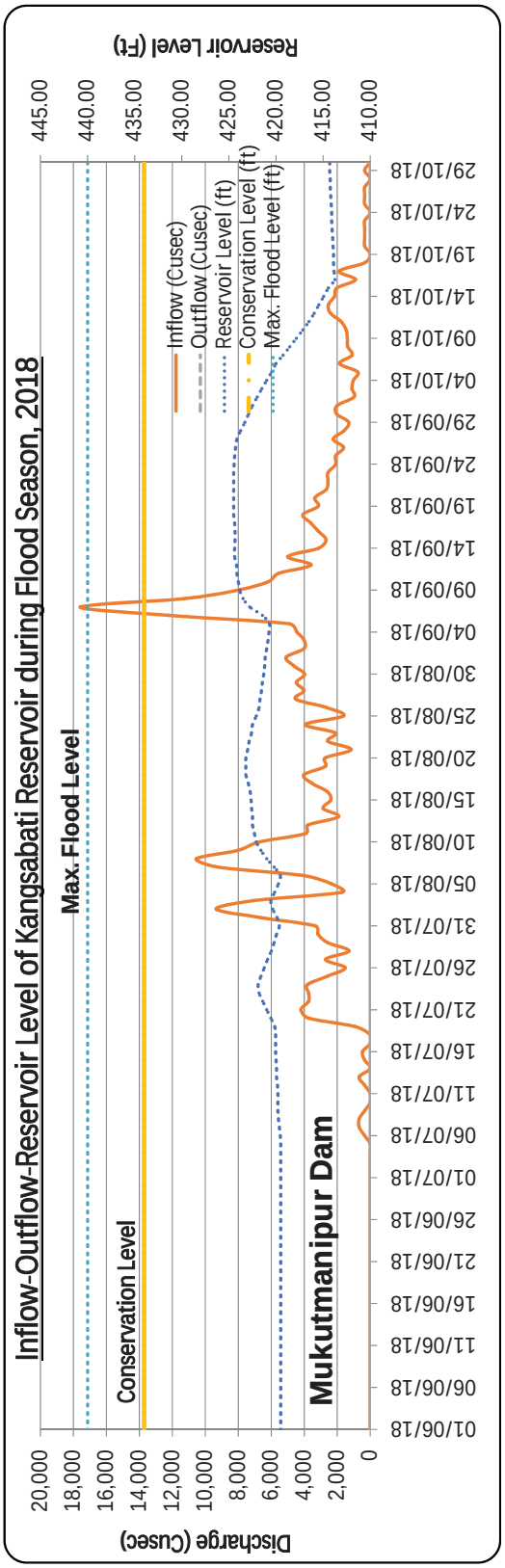
DATE	TEESTA BARRAGE			HINGLOW DAM			SIKATIA BARRAGE			EX-GALUDI BARRAGE		
	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)	RESERVIOUR LEVEL (FT)	INFLOW (CUSEC)	OUTFLOW (CUMEC)
01-Oct-18	375.89	22,756	19,859	318.50	0	0	555.34	NA	0	302.82	NA	4,578
02-Oct-18	375.56	32,348	29,501	318.30	0	0	555.24	NA	0	301.83	NA	4,458
03-Oct-18	375.56	20,141	17,297	318.00	0	0	555.18	NA	NA	301.83	NA	4,457
04-Oct-18	377.20	33,078	29,430	317.70	0	0	554.78	NA	0	301.83	NA	4,457
05-Oct-18	376.54	20,397	16,862	317.65	0	0	554.46	NA	0	301.83	NA	4,458
06-Oct-18	376.87	19,021	15,429	317.70	0	0	554.26	NA	0	301.83	NA	5,943
07-Oct-18	376.87	11,316	7,724	317.70	0	0	554.06	NA	0	301.18	NA	1,458
08-Oct-18	376.54	16,476	12,828	317.75	0	0	553.80	NA	0	302.81	NA	1,729
09-Oct-18	375.56	15,702	12,346	317.75	0	0	553.40	NA	0	301.83	NA	1,486
10-Oct-18	375.56	10,751	7,395	317.75	0	0	553.18	NA	0	301.83	NA	2,971
11-Oct-18	376.54	8,394	4,860	317.75	0	0	552.85	NA	0	301.83	NA	2,971
12-Oct-18	376.54	11,177	7,642	317.75	0	0	555.96	NA	0	301.83	NA	2,971
13-Oct-18	376.21	16,134	12,670	317.75	0	0	553.60	NA	0	301.83	NA	2,972
14-Oct-18	376.22	12,258	8,794	317.25	0	0	553.57	NA	0	301.83	NA	2,972
15-Oct-18	376.21	11,025	7,562	317.75	0	0	554.03	NA	0	301.83	NA	4,458
16-Oct-18	375.88	9,586	6,169	317.75	0	0	554.72	NA	0	NA	NA	NA
17-Oct-18	375.89	8,186	4,768	317.60	0	0	555.57	0	0	NA	NA	NA
18-Oct-18	376.22	8,455	4,771	317.55	0	0	556.13	NA	0	301.85	NA	2,971
19-Oct-18	376.22	11,378	7,562	317.20	0	0	556.16	NA	0	301.83	NA	2,971
20-Oct-18	376.54	11,523	7,642	317.00	0	0	556.03	NA	0	301.83	NA	2,972
21-Oct-18	376.54	11,523	7,642	316.75	0	0	555.96	NA	0	301.83	NA	2,972
22-Oct-18	376.22	8,631	4,815	316.50	0	0	555.90	NA	0	301.83	NA	2,972
23-Oct-18	375.23	8,287	4,674	316.00	0	0	555.93	NA	0	301.83	NA	2,972
24-Oct-18	375.56	8,402	4,720	315.60	0	0	555.96	NA	0	301.83	NA	2,972
25-Oct-18	376.21	8,631	4,815	315.25	0	0	556.00	NA	0	301.83	NA	2,972
26-Oct-18	376.21	8,631	4,815	314.75	0	0	555.91	NA	0	301.83	NA	2,972
27-Oct-18	376.54	8,741	4,860	314.30	0	0	555.87	NA	0	NA	NA	NA
28-Oct-18	376.21	8,593	4,815	313.85	0	0	555.80	NA	0	NA	NA	NA
29-Oct-18	376.54	8,279	4,415	313.45	0	0	555.70	NA	0	NA	NA	NA
30-Oct-18	376.54	8,279	4,415	312.50	0	0	555.57	NA	0	NA	NA	NA
31-Oct-18	376.54	9,322	6,465	311.70	0	0	555.44	NA	0	NA	NA	NA

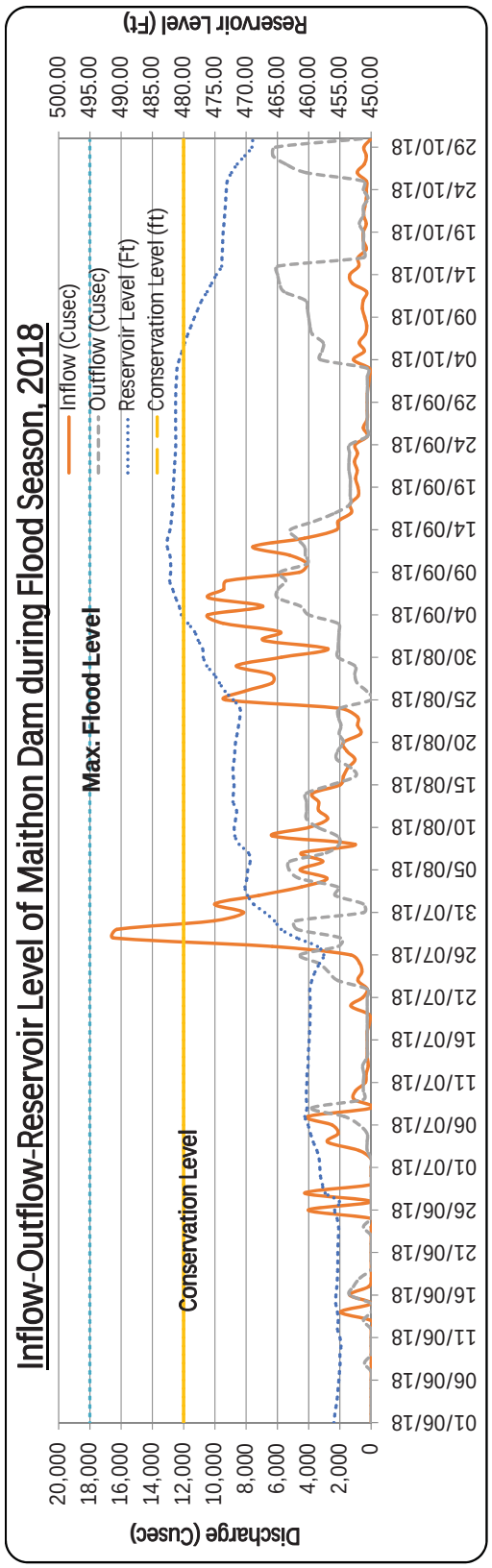
Annexure-IX: **Dam-Barrage Graphs during Flood Season, 2018**

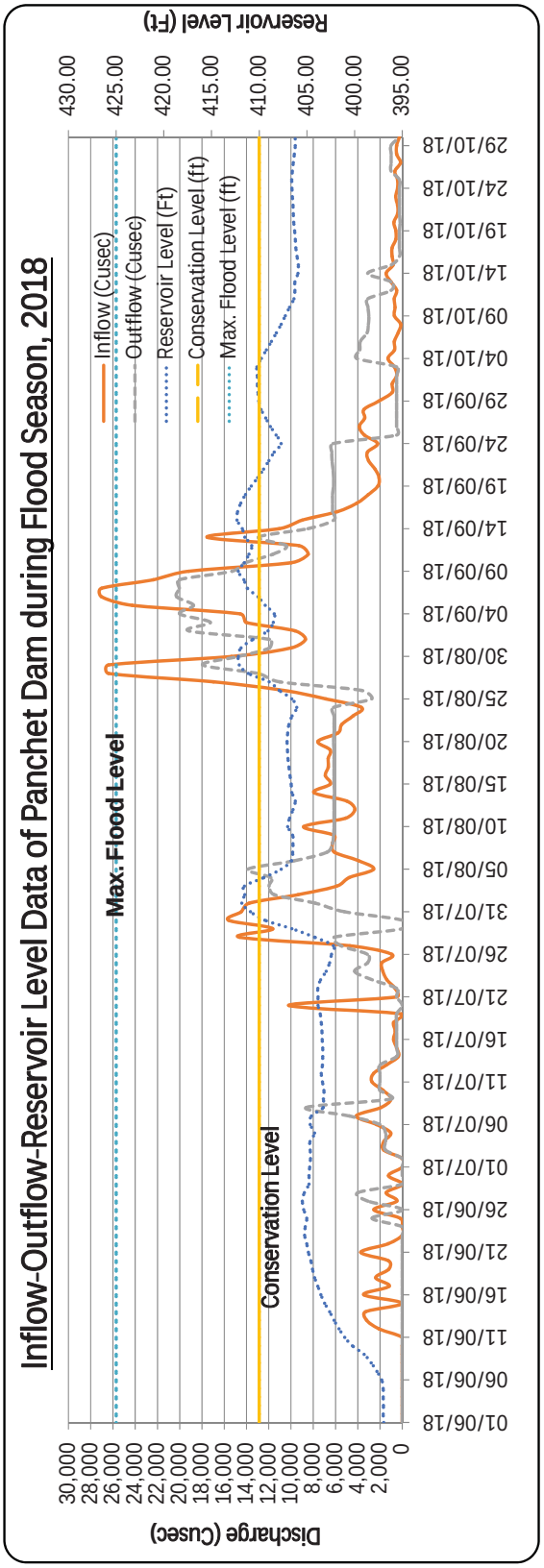


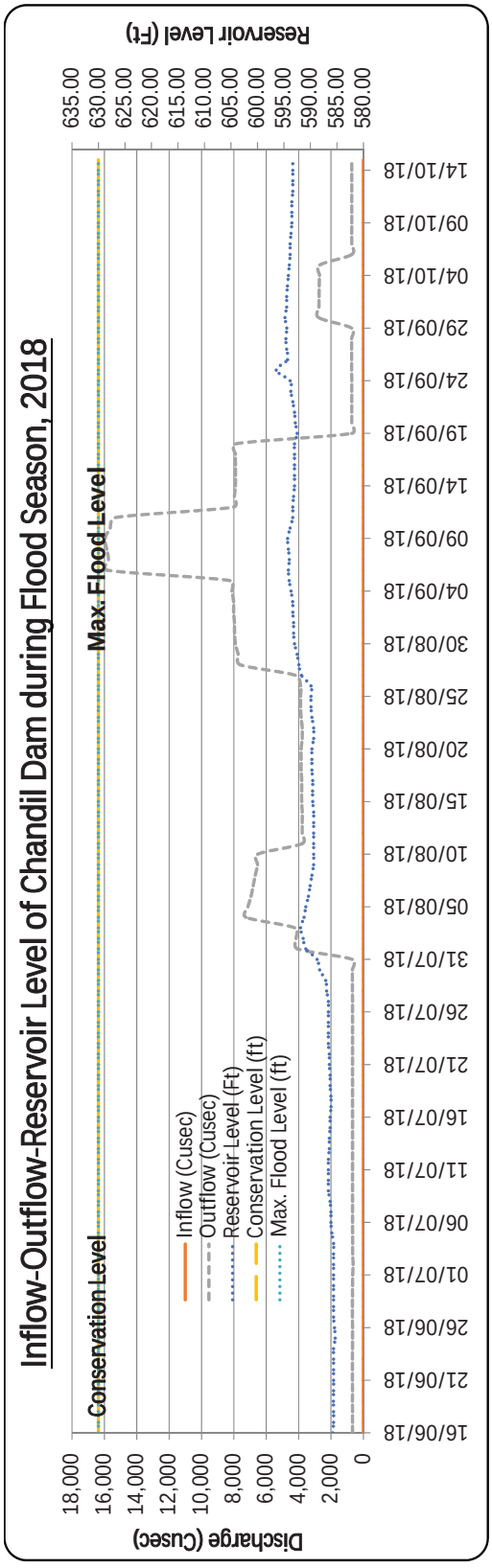


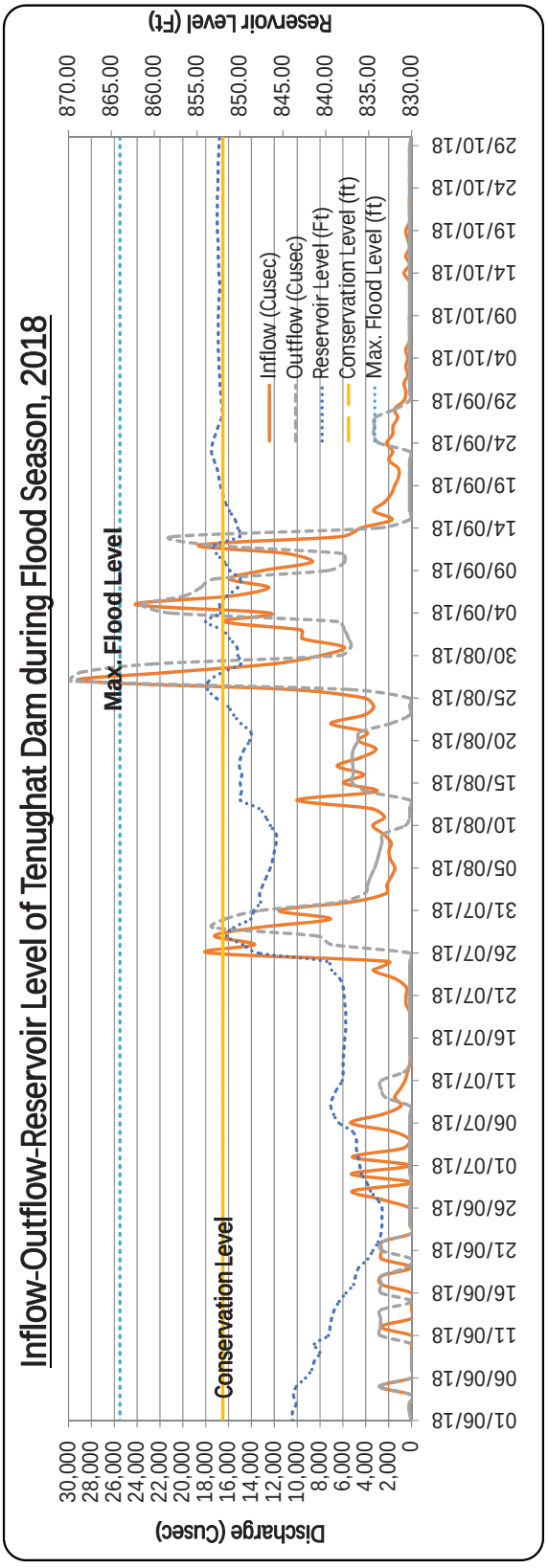

Inflow-Outflow-Reservoir Level of Tilpara Barrage during Flood Season, 2018
Max. Flood Level
Conservation Level
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (ft)
Pond Level (ft)
Max. Flood Level (ft)
Discharge (Cusec)
Reservoir Level (Ft)
Date

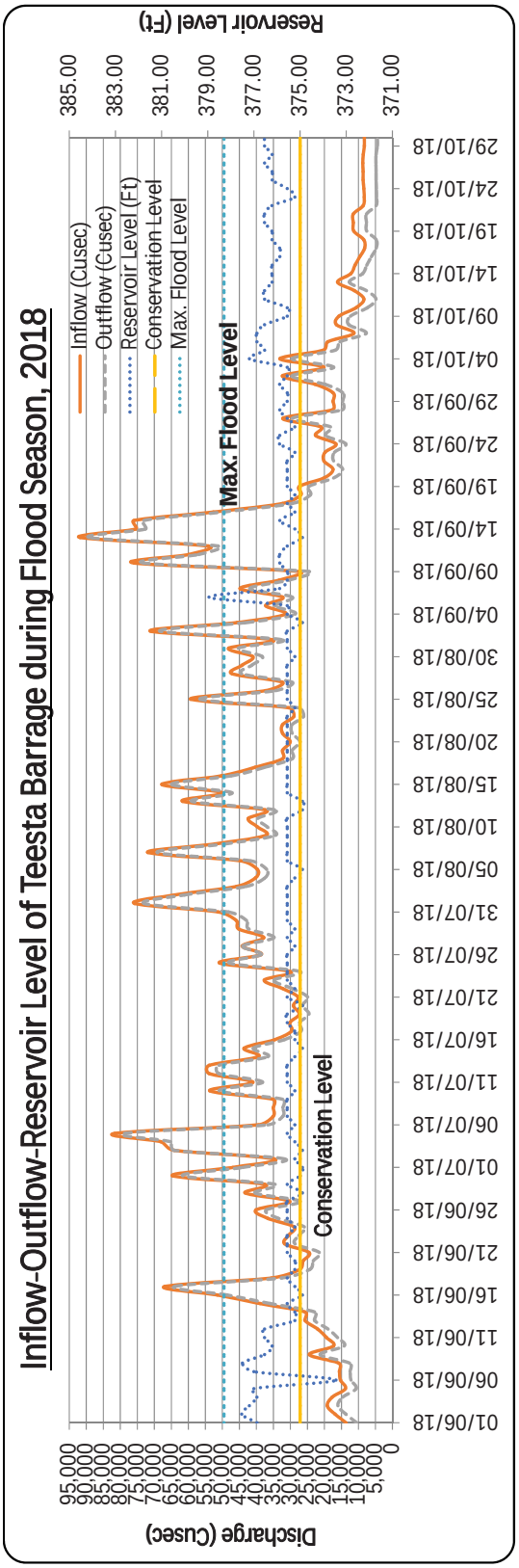

Inflow-Outflow-Reservoir Level of Kangsabati Reservoir during Flood Season, 2018
Max. Flood Level
Conservation Level
Mukutmanipur Dam
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (ft)
Conservation Level (ft)
Max. Flood Level (ft)
Discharge (Cusec)
Reservoir Level (Ft)
Date

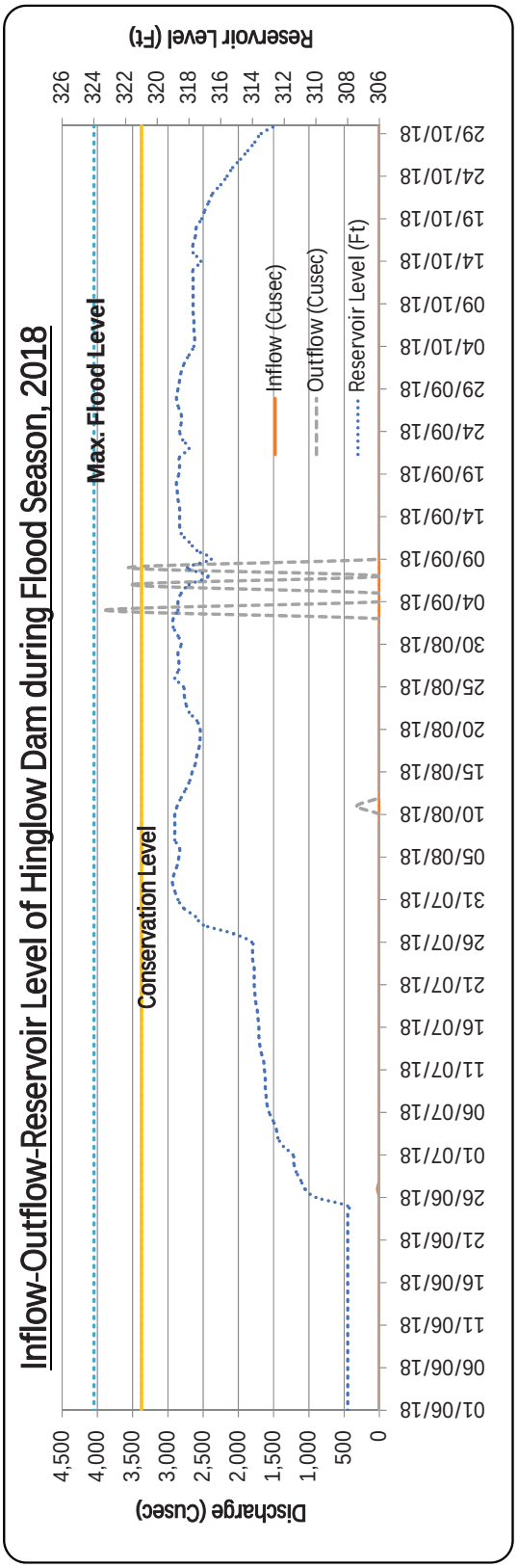

Inflow-Outflow-Reservoir Level of Maithon Dam during Flood Season, 2018
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (Ft)
Conservation Level (ft)
Max. Flood Level
Conservation Level
Discharge (Cusec)
Reservoir Level (Ft)
Date

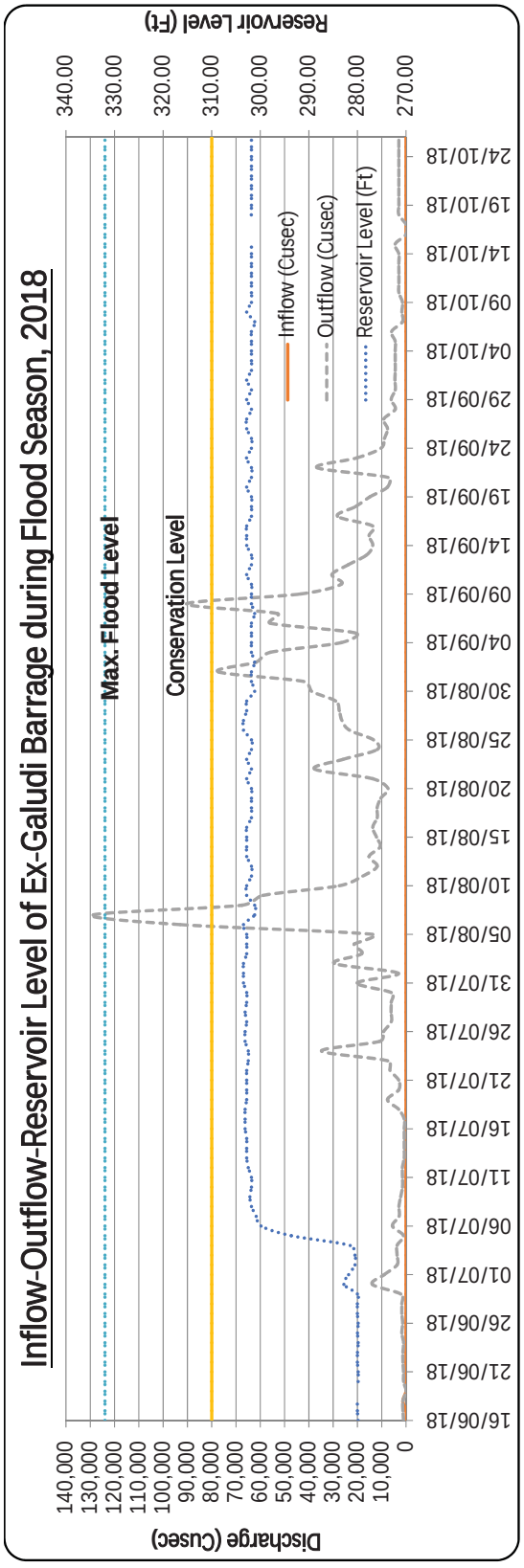

Inflow-Outflow-Reservoir Level Data of Panchet Dam during Flood Season, 2018
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (Ft)
Conservation Level (ft)
Max. Flood Level (ft)
Max. Flood Level
Conservation Level
Discharge (Cusec)
Reservoir Level (Ft)
Date

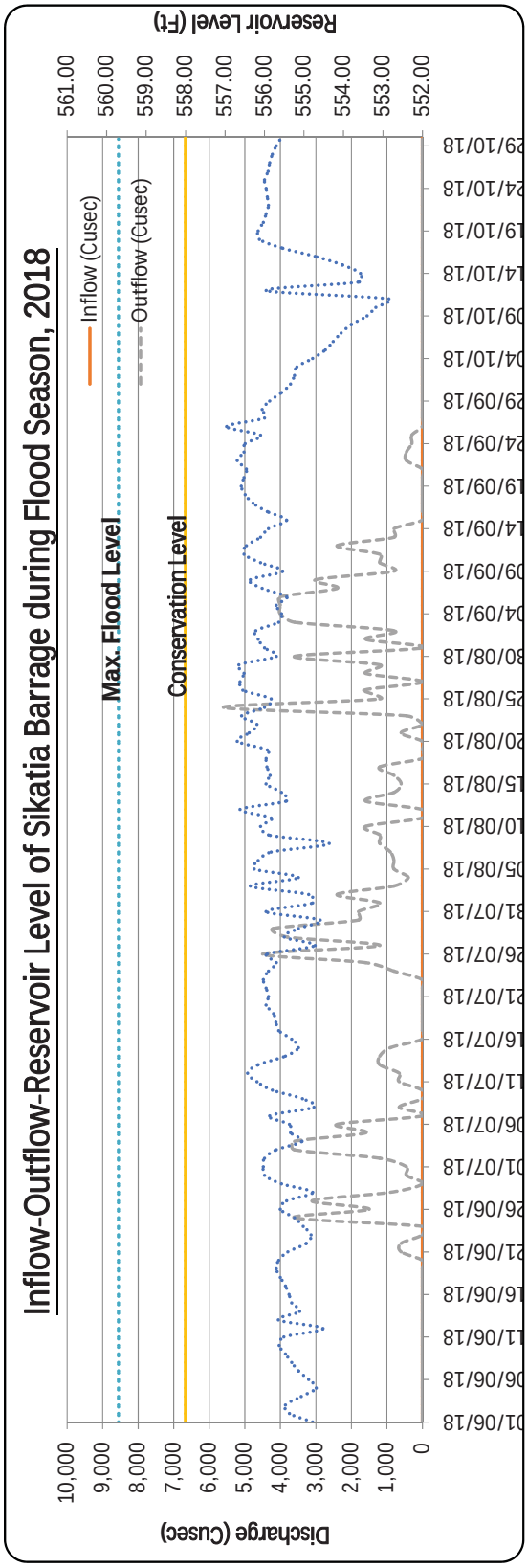

Inflow-Outflow-Reservoir Level of Chandil Dam during Flood Season, 2018
Discharge (Cusec)
Reservoir Level (Ft)
Date
Conservation Level
Max. Flood Level
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (Ft)
Conservation Level (ft)
Max. Flood Level (ft)


Inflow-Outflow-Reservoir Level of Tenughat Dam during Flood Season, 2018
Discharge (Cusec)
Reservoir Level (Ft)
Date
Conservation Level
Max. Flood Level
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (Ft)
Conservation Level (ft)
Max. Flood Level (ft)


Inflow-Outflow-Reservoir Level of Teesta Barrage during Flood Season, 2018
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (Ft)
Conservation Level
Max. Flood Level
Max. Flood Level
Conservation Level
Discharge (Cusec)
Reservoir Level (Ft)
Date


Inflow-Outflow-Reservoir Level of Hinglow Dam during Flood Season, 2018
Max. Flood Level
Conservation Level
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (Ft)
Discharge (Cusec)
Reservoir Level (Ft)
Date


Inflow-Outflow-Reservoir Level of Ex-Galudi Barrage during Flood Season, 2018
Max. Flood Level
Conservation Level
Inflow (Cusec)
Outflow (Cusec)
Reservoir Level (Ft)
Discharge (Cusec)
Reservoir Level (Ft)
Date


Inflow-Outflow-Reservoir Level of Sikatia Barrage during Flood Season, 2018
Max. Flood Level
Conservation Level
Inflow (Cusec)
Outflow (Cusec)
Discharge (Cusec)
Reservoir Level (Ft)
Date

Annexure - X

Details of Flood Warning Signals in North Bengal Rivers during Monsoon 2018

Sl. No.	Name of River	Area	Date of Signal Imposed	Time of Signal Imposed	Type of Signal	Date of Signal Withdrawn	Time of Signal Withdrawn
1	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	03-07-2018	00:30	Yellow	03-07-2018	18:30
2	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	04-07-2018	13:30	Yellow	05-07-2018	23:15
3	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	31-07-2018	16:15	Yellow	01-08-2018	06:30
4	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	01-08-2018	12:15	Yellow	01-08-2018	22:15
5	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	07-08-2018	09:20	Yellow	07-08-2018	17:15
6	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	15-08-2018	14:20	Yellow	15-08-2018	19:15
7	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	24-08-2018	17:15	Yellow	25-08-2018	22:30
8	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	27-08-2018	16:30	Yellow	29-08-2018	15:30
9	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	30-08-2018	10:30	Yellow	31-08-2018	07:30
10	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	02-09-2018	08:30	Yellow	02-09-2018	16:15
11	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	10-09-2018	07:30	Yellow	10-09-2018	17:30
12	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	14-09-2018	07:00	Yellow	14-09-2018	14:30
13	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	15-09-2018	01:30	Yellow	15-09-2018	08:15
14	Teesta	Unprotected areas of Domohani to Bangladesh border on both bank	15-09-2018	12:20	Yellow	16-09-2018	06:20
15	Jaldhaka	Protected areas at NH - 31 Road Bridge crossing to Mathabhanga	05-07-2018	02:30	Yellow	05-07-2018	11:15
16	Jaldhaka	Unprotected areas at NH-31 to Mathabhanga on both bank	23-08-2018	10:15	Yellow	23-08-2018	16:20
17	Jaldhaka	Protected & Unprotected areas at NH-31 to Mathabhanga on both bank	10-09-2018	07:15	Yellow	11-09-2018	05:00
18	Mansai	Protected & unprotected areas on both bank of Mansai River at Mathabhanga upto Bangladesh border	04-07-2018	16:00	Yellow	05-07-2018	15:00
			05-07-2018	15:00	Red	05-07-2018	18:00
			05-07-2018	18:00	Yellow	06-07-2018	11:00
19	Mansai	Protected & unprotected areas on both bank of Mansai River at Mathabhanga upto Bangladesh border	10-09-2018	13:00	Yellow	10-09-2018	14:00
			10-09-2018	14:00	Red	10-09-2018	23:15
			10-09-2018	23:15	Yellow	11-09-2018	17:00
20	Torsa	Protected & unprotected areas at Keshabashram upto Bangladesh border	04-07-2018	14:00	Yellow	06-07-2018	06:00
21	Kaljani	Protected & unprotected areas at Alipurdur PWD road bridge	04-07-2018	06:00	Yellow	05-07-2018	14:00
22	Kaljani	Protected & unprotected areas at Alipurdur PWD road bridge	10-09-2018	09:00	Yellow	10-09-2018	20:00
23	Raidak-I	Protected & Uprotected on both banks of River Raidak-I at Tufanganj upto Bangladesh border	04-07-2018	19:00	Yellow	06-07-2018	14:00
24	Diana	Chengmari	26-09-2018	09:10	Yellow	26-09-2018	14:30

Annexure XI

FLOOD DAMAGE REPORT DURING MONSOON 2018

Sl. No.	Name of River	Block / PS	District	Location of Damage (GP/Village/Mouza)	Nature and extent of damages					Inundated/ Waterlogged Area (Sq. Km)	Reference
					Breach (m)	Slip/ Subsidence / Erosion(m)	Protective works (m)	Sluices/ Bridge/ Culverts etc. (Nos.)	Cost of Damages (Rs. in Lakh)		
1	Sankosh	Kumargram	Alipurduar	Spill Checking embankment at Kathaltala Arrea from Ch 275 to Ch 320 m at Right Bank	-	-	90	-	-	-	Via e-mail Dtd. 19/03/2019 of EE/AID
2	Kaljani	Alipurduar-II		Sobhagunj area fo a length of 375.00m at DS of Railway Bridge on the right bank	-	375	-	-	19.82	-	
3	Birkuti	Falakata		Drainage Box culvert for the Birkuti Irrigation Scheme at Mitrapara at Gubarnagar GP	-	-	-	2	44.95	-	
4	Barsa	Kalchini		Basra embankment at Ch1250 to Ch 1460 along the Right Bank of River	210	-	-	-	118.35	-	
5	Jayanti			Jayanti Bazar embankment along the Right Bank of river (Ch 30 to 350m)	-	-	350	-	44.98	-	
6		Samuktala		Joypur embankment along the RB of River (Ch 220m to Ch 460m)	-	240	-	-	12	-	
7	Baniadaha	Tufanganj	Cooch Behar	Gobarchhara/ Kharija Baniadaha	-	100	-	-	9	-	Via e-mail Dtd. 18.03.2019 of EE/CID
8	Kaljani			Maruganj/Amlaguri	-	100	-	-	8	-	
9		Kotwali		Ambari/Dakshin Ambari	-	100	-	-	10	-	
10				Marichbari/Kholta	-	20	-	-	2	-	
11	Ghargharia			Dawaguri/Falimari	-	70	-	-	15	-	
12				Maruganj/Purba Solardanga	-	90	-	-	12	-	
13				Dawaguri & Maruganj/ Purba Falimari & Purba Solardanga	-	40	-	-	6	-	
14	Torsa			Ghughumar /Ghughumar	-	60	-	-	12	-	

FLOOD DAMAGE REPORT DURING MONSOON 2018

Sl. No.	Name of River	Block / PS	District	Location of Damage (GP/Village/Mouza)	Nature and extent of damages					Inundated/ Waterlogged Area (Sq. Km)	Reference
					Breach (m)	Slip/ Subsidence / Erosion(m)	Protective works (m)	Sluices/ Bridge/ Culverts etc. (Nos.)	Cost of Damages (Rs. in Lakh)		
15				Dawaguri j/Ghargharia Part-II	-	-	-	-	15	-	
16				Dawaguri /Dawaguri	-	50	-	-	15	-	
17				Guriahati-I/Kharimala Khagrabari	-	30	-	-	1	-	
18				Joreshimuli	-	70	-	-	15	-	
19	Jaldhaka			Hazrahat-II	-	250	-	-	25	-	
20		Cooch Behar		Hazrahat-I	-	150	-	-	5	-	
21	Dharala			Khursamari	-	100	-	-	5	-	
22				Chandamari/Bairati /Bairati	-	200	-	-	18	-	
23				Chandamari/Sibpur /Sibpur	-	225	-	-	20	-	
24		Sitai		Adabari	-	100	-	-	40	-	
25	Mansai	Cooch Behar		Chandamari/Bairati /bairati	-	200	-	-	18	-	
26				Chandamari/Sibpur /Sibpur	-	225	-	-	20	-	
27		Kotwali		Putimari Fuleswari, Sibpur and Hardev Chhederjhar	-	-	-	-	20	-	
28				Marichbari/Kholta	-	120	-	-	12	-	
29				Khaidanga/Aludhowa	-	-	-	-	2	-	
30	Kaljani	Tufanganj-I		Jhaljhali	-	100	-	-	9	-	
31				Bhuchungamari	-	75	-	-	7	-	
32				Jhaljhali	-	200	-	-	18	-	
33				Deocharai	-	75	-	-	7	-	
34	Raidak-I			Chikliguri	-	30	-	-	3	-	
35				Shikdar Khata	-	31	-	-	3	-	
36	Jaldhaka	Haldibari		Balsighat, Kedarhat	-	-	100	-	10	-	Via email Dtd. 26.03.2019 of EE/JID
37	Teesta			Bibiganj, Jharsingheswar, Barun BSF camp, Burigram	-	-	650	-	51	-	

FLOOD DAMAGE REPORT DURING MONSOON 2018

Sl. No.	Name of River	Block / PS	District	Location of Damage (GP/Village/Mouza)	Nature and extent of damages					Inundated/ Waterlogged Area (Sq. Km)	Reference
					Breach (m)	Slip/ Subsidence / Erosion(m)	Protective works (m)	Sluices/ Bridge/ Culverts etc. (Nos.)	Cost of Damages (Rs. in Lakh)		
38		Mathabhanga-I		Ooran BSF camp, Hemant BSF camp, Drona BSF camp	-	-	600	-	44	-	
39	Jaldhaka			Ranirhat, Basuniapara, Ucchalpukhuri	-	-	100	-	50	-	
40	Dharala			BSF camp Changrabandha	-	-	75	-	10	-	
41	Teesta	Jalpaiguri Sadar	Jalpaiguri	Boalmari-Nandanpur, kadobari, Mandalghat, Gorikone, Balapura, Sukanta Nagar, Vivekananda Pally	-	-	900	-	174	-	
42		Rajganj		Milanpally, Chumukdanga, Takimari,	-	-	300	-	55	-	
43		Maynaguri		Dharampur, Bakali, Padamoti-I, Basusuba, Barnish,	-	-	250	-	155	-	
44		Malbazar		Chengmari, Premganj	-	-	950	-	115	-	
45	Panga	Jalpaiguri Sadar		Raninagar BSF Camp, Pradhanpara, Malkani	-	-	150	-	12	-	
46	Jamuna			Haruadanga, Kharija Berubari-II, Nagar berubari, Dhologram, Sarkarpara	-	-	75	-	15	-	
47	Karala			Jelepara, Jalpaiguri Town	-	-	150	-	32	-	
48	Karatowa	Rajganj		9 no colony, Sahebpara, Sitaguri	-	-	100	-	10	-	
49	Jaldhaka	Maynaguri		Dharaikuri, Baxidanga,	-	-	150	-	40	-	
50	Jarda			Maynaguri town	-	-	50	-	24	-	
51	Dharala			Charerpar	-	-	30	-	10	-	
52	Diana	Dhupguri		Kalabari, Chengmari	-	-	150	-	20	-	
53	Reti Sukriti			Angrabhasa, Chumurchi forest line	-	-	30	-	15	-	

FLOOD DAMAGE REPORT DURING MONSOON 2018

Sl. No.	Name of River	Block / PS	District	Location of Damage (GP/Village/Mouza)	Nature and extent of damages					Inundated/ Waterlogged Area (Sq. Km)	Reference
					Breach (m)	Slip/ Subsidence / Erosion(m)	Protective works (m)	Sluices/ Bridge/ Culverts etc. (Nos.)	Cost of Damages (Rs. in Lakh)		
54	Gilandi			Betagara	-	-	30	-	10	-	
55	Dudua			Purba Mallik para, Balasunder	-	-	200	-	20	-	
56	Umesh Khal			Banarhat (Hatinala)	-	-	400	-	35	8	
57	Jaldhaka			Godheyarkuthi, Dambari, Betgara	-	-	450	-	40	-	
58	Jaldhaka	Nagrakata		Bamandanga Majhiali,	-	-	150	-	65	-	
59	Diana			Kherkata, Majhiali, sulkapara	-	-	800	-	65	-	
60	Gathiya			Chattandu	-	-	30	-	25	-	
61	Dharala	Malbazar		Uttar Matiali, Panditpara, Daburipara, Saripakuri	-	-	60	-	20	-	
62	Gheesh			Oodlabari	-	-	150	-	15	-	
63	Chel			Manabari, Khudirampally, Sailyjote	-	-	150	-	25	-	
64	Leesh			Bagrakote, Doba basti	-	-	170	-	35	-	
65	Layti			Oodlabari	-	-	30	-	8	-	
66	Mal			Malbazar	-	-	50	-	18	-	
67	Neora			Uttarjhar Matiali, Lataguri, Dakshin Kantadighi, Mathachulka, Boguladhura	-	-	150	-	45	-	
68	Khulnai			Uttar Khalpara	-	-	200	-	17	-	
69	Tangon	Kushmundi.	South Dinajpur	Palpara Agrakhari, Dhakdol, Churamon, Sherpur	-	630	-	1	29	-	Via email Dtd. 26/03/2019 of EE/SDID
70		Banshihari.		Beel borail, Ellahabad, Ganguria	-	190	-	-	7	-	
71	Chiramoti	Harirampur		Sirshi, Bagichapur	-	160	-	-	13	-	
72	Punarbhaba	Gangarampur		Mallickpur, Champatali, Dakshin Debipur	-	430	-	4	23	-	
73		Tapan		Jadav Bati, Shutal, Purba	-	280	-	-	16	-	

FLOOD DAMAGE REPORT DURING MONSOON 2018

Sl. No.	Name of River	Block / PS	District	Location of Damage (GP/Village/Mouza)	Nature and extent of damages					Inundated/ Waterlogged Area (Sq. Km)	Reference
					Breach (m)	Slip/ Subsidence / Erosion(m)	Protective works (m)	Sluices/ Bridge/ Culverts etc. (Nos.)	Cost of Damages (Rs. in Lakh)		
				Shutal, Nababnagar							
74	Bramhoni	Gangarampur		Laxmitala	-	110	-	-	1.5	-	
75	Atrai	Kumarganj.		Village-Kumarganj, Chadpur Mouza	-	160	50	-	10	-	
76		Balurghat.		Paranpur village, Khadimpur mouza	-	120	-	21	6	-	
77	Jamuna	Hili		Goyespur mouza, Hili Mouza	-	-	-	10	2	-	
78	Ganga	Ratua-I	Malda	Bhilaimari, Mahanandatola/Janjalitola, Naya Bhilamari, Tiklichar, Bhasabona, Jafarhalitola, Khaksabona/Gadaimaharajpur, Maniknagar	-	4050	-	-	3491.1	16	Vide Memo. No.363 dated on 18.03.2019 of EE/MID
79		Manikchak		Gopalpur,Dharampur/Balutola, Wahedmari Monnarbagan/Jotebhabani, Dharampur,Khanpur	-	2000	-	-	1745.55	-	
80		Kaliachak-III		Pardaonapur-Sovapur/ Parlalpur/ Paranupnagar	-	4500	500	-	654	12	
81	Mahananda	Ratua-II		G.P. & Vill.- Maharajpur	-	500	-	-	200	-	Vide Memo. No. 40 Dtd. 18.03.2019 of MED
82		Chanchal-I		G.P. - Kharba Vill. - Islampur	-	1000	-	-	250	-	
83	Fulhar	Harishchandrapur-II		G.P. - Daulatnagar Vill.- Gobra Mouza- Daulatnagar	-	-	50	-	45	-	
84				G.P. - Daulatnagar Vill.- Khidirpur Mouza- Daulatnagar	-	250	-	-	400	-	
85				Par Bhaluka (Right Bank)	-	300	-	-	280	-	
86		Ratua-I		Vill. - Kamalpur G.P.-Kahala	-	100	-	-	10	-	
87				Vill. - Surjapur G.P.-Kahala	-	-	650	-	600	-	

FLOOD DAMAGE REPORT DURING MONSOON 2018

Sl. No.	Name of River	Block / PS	District	Location of Damage (GP/Village/Mouza)	Nature and extent of damages					Inundated/ Waterlogged Area (Sq. Km)	Reference
					Breach (m)	Slip/ Subsidence / Erosion(m)	Protective works (m)	Sluices/ Bridge/ Culverts etc. (Nos.)	Cost of Damages (Rs. in Lakh)		
88				Vill. - Daraktola, Gangaramtola,Ramyanpur and Ruhumari G.P.-Mahanandatola	-	1500	-	-	1000	-	
89	Ganga	Farakka	Murshidabad	Parsujapur	-	4000	-	-	6000	-	Vide Memo. No. 195 Dtd. 15.03.2019 of EE/GAED-I
90				Arjunpur	-	-	650	-	700	-	
91				Muskinagar	-	-	200	-	400	-	
92				Narayan Mondal Para - Sayedalipara	-	800	-	-	1200	-	
93		Dhuliyan Municipality		Downstream of S1 Spur	-	-	500	-	800	-	
94				N2 Spur	-	-	70	-	500	-	
95				Downstream of N2 Spur	-	-	300	-	500	-	
96				Lalpur Masjid Area	-	-	200	-	300	-	
97		Samserganj		Dhusuripara	-	500	-	-	500	-	
98				Kamalpur	-	-	500	-	700	-	
99		Suti-II/Suti		Bajitpur	-	-	200	-	300	-	
100				Shyampur-Hasanpur MSK	-	-	500	-	500	-	
101		Raghunathganj		Chandpur	-	-	500	-	500	-	
102	Padma	Lalgola		Kantakhali	-	-	350	-	1000	-	
103				Moya	-	-	500	-	1000	-	
104				Sekhalipur	-	-	300	-	500	-	
105	Bhagirathi	Raghunathagnj-II		Sekendra	-	-	2500	-	2000	-	
106				Enayetnagar	-	-	1000	-	800	-	
107				Jothkamol	-	-	3450	-	3000	-	
108		Raghunathagnj-I		Dafarpur Ferry Ghat	-	-	300	-	200	-	
109				Natunganj	-	-	1000	-	800	-	
110				Birendranagar	-	-	800	-	600	-	
111		Sagardighi		Kuthipara	-	-	1000	-	800	-	

FLOOD DAMAGE REPORT DURING MONSOON 2018

Sl. No.	Name of River	Block / PS	District	Location of Damage (GP/Village/Mouza)	Nature and extent of damages					Inundated/ Waterlogged Area (Sq. Km)	Reference
					Breach (m)	Slip/ Subsidence / Erosion(m)	Protective works (m)	Sluices/ Bridge/ Culverts etc. (Nos.)	Cost of Damages (Rs. in Lakh)		
112				Biswanathpur	-	-	1200	-	1000	-	
113				Kabilpur	-	-	1500	-	1200	-	
114				Dasturhat	-	-	500	-	400	-	
115	Ganga-Padma	Bhagwangola-I		Lahalamari	-	520	-	-	350	-	Via e-mail Dtd. 28.11.18 of EE/GAE-II
116				Charbin Mathpara	-	200	-	-	145	-	
117				Charbabupur Mathpara	-	220	-	-	155	-	
118		Jalangi		Jalangi Bazar	-	-	120	-	180	-	
119	Bhagirathi	Nabadwip	Nadia	Forestdanga, Majdia Panshila	-	200	-	-	14	-	Via e-mail Dtd. 26.03.19 of EE/NID
120		Santipur		Gayeshpur, Srirampur	-	200	-	-	5	-	
121		Chakdaha		Chanduria-I (Gournagar Ghat)	-	80	-	-	6	-	
122	Bay of Bengal	Ramnagar-I, Mandarmoni Coastal	Purba Medinipur	Padima-I	-	-	515	-	152.17	-	Via e-mail Dtd. 12.11.18 of EE/CID
				Total	**210**	**26426**	**28175**	**38**	**37867.42**	**36.000**	

Annexure XII

CENTRAL FLOOD CONTROL ROOM & NODAL OFFICERS OF I. & W. DEPARTMENT

Sl. No.	DISTRICT	STATION / PLACE	CONTACT DETAILS OF NODAL/COORDINATING OFFICERS	TELEPHONE NUMBERS OFFICE
1	KOLKATA	Central Flood Control Room (CFCR), Gr. Floor, Jalasampad Bhawan, Salt Lake City, Kolkata	Director, Advance Planning, Project Evaluation & Monitoring Cell (APPEMC)	(033) 2337-0281 FAX: (033) 2337-0287
			24-Hours Toll Free Help Line : 1800-345-0117	
			Land Line No. : 033-2321-8341 FAX No. : 033-2321-5604	
			Cell Phone Number: 89008-90603 & 94325-84007	
			E-mail ID : cfcriwdwb@gmail.com Web Site : www.wbiwd.gov.in	
		Different Pumping Stations (Kolkata Municipal Areas)	Executive Engineer, Mechanical Electrical Division	(033) 2321 5609
			Executive Engineer, Metropolitan Drainage Mechanical Division	(033) 2334 5768

DISTRICT FLOOD CONTROL ROOMS & NODAL OFFICERS OF I. & W. DEPARTMENT

Sl. No.	DISTRICT	STATION / PLACE	CONTACT DETAILS OF NODAL/COORDINATING OFFICERS	TELEPHONE NUMBERS OFFICE
2	Jalpaiguri	Flood Control Cell, North Bengal, Jalpaiguri	Executive Engineer, Jalpaiguri Irrigation Division, Club Road, Jalpaiguri.	(03561) 230249 Control Room (03561) 230153 FAX: (03561) 230786 Toll Free Help Line (1800-345-3255)
3	North 24-Parganas	Basirhat	Executive Engineer, Basirhat Irrigation Division, Dhaltitha, Basirhat	(03217) 265-258
		Barasat	Executive Engineer, Bidyadhari Drainage Division, Taki Road, Barasat	(033) 2562-4520 FAX: 2562-4520
4	South 24-Paganas	Joynagar	Executive Engineer, Joynagar Irrigation Division, Joynagar	(033) 2433-2887
		Kakdwip	Executive Engineer, Kakdwip Irrigation Division, Kakdwip	(03210) 255122
5	Howrah	Uluberia	Executive Engineer I, Lower Damodar Construction Division	(033) 2661 0311
			Executive Engineer II, Lower Damodar Construction Division	(033) 2661 0090
6	Hooghly	Singur	Executive Engineer I, Lower Damodar Irrigation Division, Singur	(033) 2630-0170
			Executive Engineer II, Lower Damodar Irrigation Division, Singur	(033) 2630-2260
7	Purba Bardhaman	Burdwan	Executive Engineer I, Damodar Canal Division, Burdwan	(0342) 2662496 FAX: (0342) 2550166 Control Room (0342) 2645672)
			Executive Engineer II, Damodar Canal Division, Burdwan	
8	Paschim Bardhaman	Durgapur	Executive Engineer, Damodar Head Works Division, Durgapur	(0343) 2555640 (0343) 2002012 (Barrage)
		Asansol	Executive Engineer, Asansol Irrigation Division, Asansol	New Office
9	Bankura	Bankura	Executive Engineer, Bankura Irrigation Division, Bankura	(03242) 254934
		Khatra	Executive Engineer, Kangsabati Canal Divn.No.II, Khatra	(03243) 255236
10	Purulia	Purulia	Executive Engineer, Purulia Irrigation Division, Purulia	03252-222407

Sl. No.	DISTRICT	STATION / PLACE	CONTACT DETAILS OF NODAL/COORDINATING OFFICERS	TELEPHONE NUMBERS
				OFFICE
11	Jhargram	Jhargram	Executive Engineer, Jhargram Flood Management & Planning Division, Jhargram	New Office
Sl. No.	DISTRICT	STATION / PLACE	CONTACT DETAILS OF NODAL/COORDINATING OFFICERS	TELEPHONE NUMBERS
				OFFICE
12	Paschim Medinipur	Midnapore	Executive Engineer, West Medinipur Division, Midnapore	(03222) 275373
13	Purba Medinipur	Tamluk	Executive Engneer, East Medinipur Division, Tamluk	(03228) 266889
		Contai	Executive Engineer, Contai Irrigation Division, Contai	(03220) 255162 **FAX:** (03220) 256436
14	Birbhum	Suri	Executive Engineer, Mayurakshi Hd. Qtrs. Division, Suri	03462-255229
		Bolpur	Executive Engineer, Mayurakshi South Canals Division, Shyambati, Bolpur	03463-262256
		Rampurhat	Executive Engineer, Mayurakshi North Canals Division, Rampurhat	03461-255039
15	Nadia	Krishnanagar	Executive Engineer, Nadia Irrigation Division, Krishnanagar	03472-252451
16	Murshidabad	Berhampore	Executive Engineer, Berhampore Irrigation Division, Berhampore	03482-250645
17	Malda	Malda	Executive Engineeer, Malda Irrigation Division, Green Park, Malda.	03512-252395 **FAX:** 03512-254350 Control Room: (03512-253939)
18	Uttar Dinajpur	Raigunj	Executive Engineer, North Dinajpur Irrigation Division	03523-252008
19	Dakshin Dinajpur	Balurghat	Executive Engineer, South Dinajpur Irrigation Division	03522-255113
20	Darjeeling	Siliguri	Executive Engineer, Siliguri Irrigation Division, Mahanandapara, Siliguri	0353-2431842
21	Coochbehar	Coochbehar	Executive Engineer, Coochbehar Irrigation Division, Coochbehar	03582-228305 Control Room (03582) 229114
22	Alipurduar	Alipurduar	Executive Engineer, Alipurduar Irrigation Division, Alipurduar	03564-255305 Control Room (03564) 274198

CONTROL ROOMS UNDER TEESTA BARRAGE PROJECT, I. & W. DEPARTMENT

23	Jalpaiguri	Gajoldoba	Teesta Barrage Control Room	9064161095
		Fulbari	Mahananda Barrage Control Room	(03532) 005612

INDEX MAP OF FLOOD AFFECTED AREAS (2000-2017) IN WEST BENGAL