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GOVERNMENT OF WEST BENGAL
IRRIGATION & WATERWAYS DIRECTORATE

ANNUAL FLOOD REPORT 1999

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ANNUAL FLOOD REPORT OF WEST BENGAL FOR THE YEAR 1999

INDEX

		Page
1	Introduction	1
1.1	River Basins	1
1.2	River Systems	1
1.2.1	Brahmaputra Basin	1 - 3
1.2.2	Ganga Basin	3 - 9
1.2.3	Subarnarekha Basin	10
2	Rainfall	10
2.1	Rainfall Pattern	10 - 11
3	Report on Flood caused by Cyclone & High Intensity of Rainfall in West Bengal during the Flood Period of 1999	12 - 31
Annexure-I	Monthly Districtwise Actual & Normal Rainfall along with Per Cent Departure from Normal for the Year 1999	Sheet 1-12
Annexure-II	Important Reservoir Levels & Outflow Data during the Flood Season of 1999	Sheet 1-7
Annexure-III	Important Gauge Levels of Rivers during Flood Season of 1999	Sheet 1-16
Annexure-IV	Important Barrage Levels & Discharge Data during the Flood Season of 1999	Sheet 1-2
Annexure-V	Proforma Statement showing Districtwise Details of different types of Damages and the Cost Involved therein for Restoration Works due to recent Flood during 1999	Sheet 1-11
Annexure-VI	Requirement of Fund for Flood Fighting & Restoration Works for the Flood of 1999	Sheet-1
Annexure-VII	Table of Districtwise Area Inundated in the Year 1999 due to Flood against the actual Territorial Areas	Sheet-1
Annexure-VIII	Dam/Barrage Release Data for the period from 24.9.99 to 28.9.99, 19.10.99 and 20.10.1999	Sheet-1
Drawing 1	Index Map of West Bengal showing Flooded Areas in different Districts during Flood Season of 1999	
Drawing 2	Map showing Hydrological Observation Sites along with existing sites of West Bengal	
Drawing 3	Index Map showing the Damages during Flood of 1999 in the districts of West Bengal	
Drawing 4	Graphs showing important Gauge Levels of Rivers during the Flood Season of 1999	
Drawing 5	Graphs showing the important Reservoir & Barrage Levels and Outflow Data during the Flood Season of 1999	
Drawing 6	Index Map showing Districtwise Inundated Area & other Damages during Flood of 1999	

ANNUAL FLOOD REPORT 1999

1 INTRODUCTION

The State of West Bengal consists of a combination of land varying from the high hills on the north to the seas on the south. With the Tropic of Cancer running across it, the State is located between 21° 31' and 27° 13' 14" North latitudes and 85° 45' 20" and 98° 53' East longitudes. The geographical area of the State is about 87,853 sq.km. Flood season in State starts from 15th June and extends upto 15th October.

Classification of Areas

1	Geographical Area	---	87,853 sq.km.
2	Area under Forest	---	11,880 sq.km.
3	Total Flood Prone Area	---	37,660 sq.km.
4	Area already Protected	---	26,500 sq.km.

1.1 RIVER BASINS

The State can be demarcated into three district drainage basins, coming under the Ganga, Brahmaputra and Subarnarekha system respectively. The afore stated main basins in turn can be divided into sub-basins having individual catchment of their own. The areawise distribution of the above main basins in the State is under :

1	Brahmaputra Basin	---	14,208 km^2
2	Ganga Basin including Sundarban Area	---	71,485 km^2
3	Subarnarekha Basin	---	2,160 km^2

1.2 RIVER SYSTEM

1.2.1 Brahmaputra Basin Drainage – the northern regions of the State, the rivers within the Brahmaputra system consists of a total area of 14,208 km^2 and the main rivers being Sankosh, Raidak, Torsa, Kaljani, Jaldhaka and Teesta. The different tributaries of these rivers are listed below :

(A)	Sankosh	Chiklajhore
(B)	Raidak	Raidak-I, Raidak-II, Turturi
(C)	Torsa	Kaljani, Sil-Torsa, Char-Torsa, Dolong, Sanjai, Ghargharia, Goram, Dina, Pana, Jainti, Gabur-Basra.
(D)	Jaldhaka	Mujnai, Murti, Diana, Sutanga, Dolong, Dharala, Ghatia, Kumlai Gilandi, Buduya.
(E)	Teesta	Great Rangeet, Raman, Rangpo, Melli, Dish, Ghish, Chel, Mal, Neoro, Karali.

BRIEF DESCRIPTION OF THE ABOVE RIVERS

(A) SANKOSH

It is the eastern main river under Brahmaputra system in this State and serves as the natural boundary between West Bengal and Assam. After being joined by Raidak-II, it outfalls into Brahmaputra in Bangladesh by the name Gangadhar. The river has its origin in Bhutan.

(B) RAIDAK

Originate in Mt. Akungphu at an altitude of 6400 m in Bhutan. The river bifurcates into two channels at Bhutanghat, close to Indo-Bhutan border. One of the branches, namely Raidak-I joins the united stream of Torsa and Kaljani, while the Raidak-II is joined by Sankosh and outfalls into Brahmaputra to Bangladesh by the name Gangadhar.

(C) TORSA

The river Torsa in Chumbi Valley of southern Tibet at an altitude of 7065 m. It flows through Tibet, Bhutan, West Bengal and Bangladesh. Below Hasimara Bridge (on NH-34) it bifurcates into two channels, viz. Sil Torsa and Char Torsa. They reunite at Datlakhowa forest. The river passes by the Coochbehar town and is joined by rivers Kaljani and Raidak-I. The combined flow outfalls into Brahmaputra near Nageswari at Rangpur in Bangladesh.

(D) JALDHAKA

The river has its origin Pitang Lake in Sikkim at an altitude of 4400 m. It flows through Sikkim, Bhutan, West Bengal and Bangladesh. After the river is joined by a number of streams and tributaries both in the mountainous and sub-mountainous regions, it finally flows into Dharala river and the combined stream, getting the name Dharala ultimately outfalls into Brahmaputra in Bangladesh.

(E) TEESTA

Teesta originated in the Glaciers of North Sikkim at an altitude of 6400 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 Melli, it forms the boundary between West Bengal and Sikkim. Two of its tributaries, viz. Great Rangit and Ramman, also serve as the natural boundary between the two States. It outfalls into Brahmaputra in Rangpur district of Bangladesh.

1.2.2 GANGA BASINS

The Central, Southern and the South-Western parts of the State of West Bengal constitute the Ganga Basin. The Ganga, only a stretch of which is now flowing through the narrow Central west line of the present shape of this State had been an active Delta builder.

The Ganga system comprises a total area of 71,485 km^2 within the State of West Bengal. The catchment areas of different rivers within this system in the State of West Bengal are as under :

Sl. No.	Name of River Sub-Basin	Catchment Area (in km^2)
1	*2*	*3*
(a)	Mahananda	9,460
(b)	Punarbhaba	730
(c)	Atrai	910
(d)	Pagla Barsloi	730
(e)	Dwarka-Brahmani	2,500
(f)	Bhagirathi-Hooghly	1,170

Sl. No.	Name of River Sub-Basin	Catchment Area (in km^2)
1	*2*	*3*
(g)	Jalangi	5,344
(h)	Mayurakshi	2,720
(i)	Ajay	2,490
(j)	Khari-Gangur-Ghea	1,302
(k)	Churni	800
(l)	Damodar	5,250
(m)	Dwarkeswar	4,430
(n)	24-Parganas (South & North) and Calcutta Port Drainage Basin	4,330
(o)	Kangsabati	8,369
(p)	Silabati	3,952
(q)	Rupnarayan	2,548
(r)	Bichban	820
(s)	Rasulpur	1,130
(t)	Haldi	980
(u)	Tidal Zone (Sundarbans Areas)	11,320

The different tributaries of these rivers are listed below :

1	Punarbhaba	-	Punarbhaba		
2	Mahananda	-	Mechi, Balasan, Dauk, Nagar, Kulik, Gumar, Chiramati, Tangon		
3	Atrai	-	Atrai		
4	Pagla	-	Barsloi	-	Pagla, Barsloi, Bagmari
5	Brahmani	-	Dwarka	-	Brahmani, Dwarka
6	Bhagirathi	-	Hooghly	-	Bhagirathi, Hooghly
7	Jalangi			-	Jalangi, Silamari, Bhairab, Suti
8	Mayurakshi			-	Mayurakshi, Babla, Noon Beel Siddheswari, Kuiya, Kopai, Bakreswar, Sal, Monikarnia, Daoki, Kana Mor, Gambhira
9	Ajay			-	Ajay, Hinglow, Kunoor
10	Khari-Gangur-Ghea			-	Khari, Brahmani, Banka, Bangour, Ghea, Behula, Kana

11	Churni	-	Churni
12	Damodar	-	Damodar, Barakar, Sali
13	Dwarkeswar	-	Gandheswari, Dwarkeswar Arkasha, Berai
14	Rupnarayan	-	Mundeswari, Dwarkeswar, Gandheswar, Damodar, Berai, Tarjuli, Sankari, Silabati, Joypanda, Kubai, Parang, Kanki
15	Haldi	-	Haldi, Banki, Kangsabati, Kumari, Bhairab, Tarafeni, Kaliaghai, Bagchai, Chan-dra Kapaleswari
16	Rasulpur	-	Rasulpur, Dichaban
17	Tidal Rivers	-	Tolly's Nullah, Keora-pukur, Ichamati, Rai-mongal, Kultigong, Jamuna, Kalindi, Haria Bhanga, Gosaba, Metia, Piali, Thakuran, Raidighi, Saptamukhi, Muri Ganga, Matla, Dansa, Kalagachi, Bidyadhari etc.

BRIEF NOTE ON THE ABOVE SUB-BASINS

(1) MAHANANDA

The river Mahananda originates from Paglajhora near Kurseang town. It bifurcates into two channels, viz. Fulahar Branch that flows through Bihar and Bansloi Branch that flows through West Bengal. At places, it forms the Indo-Bangladesh border. Mahananda carrying the flow of four tributaries, namely Nagar, Kalindri, Tangon and Punarbhaba, drains into Ganga from the North-Western side at Godogarighat just downstream of the point where Ganga leaves the boundary of West Bengal.

(2) ATRAI

Punarbhaba – some rivers like Sahu, Nim, Talma, Chani, Panga originate from the high lands in the district of Jalpaiguri. They gradually meet together afterwards; the combined stream assumes the name Karatowa. It then enters Bangladesh where it assumes the name Atrai and bifurcates into two channels, viz. Deepa and Atrai.

The Eastern channel, i.e. Atrai re-enters West Bengal in Kumarganj P.S. of West Dinajpur district covering 40 kms length in the State. It re-enters into Bangladesh and ultimately outfalls into Brahmaputra.

The Deepa on the other hand taking a south-westernly course enters Gangarampur P.S. in South Dinajpur district, assuming the name Punarbhaba. Covering some 40 kms in length in West Dinajpur district, it touches the eastern boundary of Malda district and enters Bangladesh. Further down, it meets Mahananda in Bangladesh.

(3) NAGAR-KULIK, GAMARI CHIRAMATI, TANGON, KALINDRI

These rivers flow through Malda and West Dinajpur districts. Somewhere they form the boundary either between West Bengal and Bihar or between West Bengal and Bangladesh, ultimately outfall into Mahahanda.

Nagar originating in Bangladesh flows along the boundary with West Bengal. Taking a sounthernly course, it receives a spill channel of Mahananda and is joined by Kulik, which has also its origin in Bangladesh. The Gamari and Chiramati are two small rivers that flow through West Dinajpur district before meeting the combined stream which ultimately outfall into Mahananda.

Tangon is a tributary to Mahananda. It rises in Bangladesh. After flowing through the districts of West Dinajpur and Malda, it meets Mahananda on the boundary of Malda and Bangladesh.

River Kalindri has its origin in the North Bihar, flowing across the plains of Purnea district. It enters Malda and outfalls into Mahananda.

(4) PAGLA-BARSLOI-BRAHMANI

These rivers originate from Rajmahal hills of Bihar. Flowing easternly across Birbhum district, they enter Murshidabad district as the tributaries of Bhagirathi.

(5) JALANGI-BHAIRAB

Jalangi takes off from the right bank of river Padma in Murshidabad district, 165 km downstream of Farakka. It is dead for all purposes, except during the rains, when it receives water from Padma. The river ends its journey by finally outfalling into Hooghly near Nabadwip town. In its lower stage of journey, it is also known as Kharia.

Bhairab takes off from Ganga in P.S. Lalbag of Murshidabad district. It is now almost a dead channel but during rainy season for a few days, it receives water from Padma.

(6) ICHAMATI-CHURNI

River Mathabhanga originates from the mouth of the Jalangi of Padma. It is not an important river in this stage as it flows mainly in Bangladesh. It flows only a few kilometers within Nadia district. At this stage, the river bifurcates into two channels, the eastern branch, i.e. Churni runs a few kilometers in the district in a south-west direction to meet Bhagirathi. The other branch is known as Ichamati which gets little supply from Mahananda and thrives on wash outs by tidal flows.

(7) BHAGIRATHI-HOOGHLY

Bhagirathi or Hooghly is the main river in the State. It is in fact that the main artery of flow before the 12th century, the Ganga had its main course down Bhagirathi-Hooghly. Subsequently, the main flow was pushed to the east through the present course of Padma. The flow of Bhagirathi increases downstream due to the run off and outflows from a number of eastern and western tributaries.

After its confluence with Jalangi, Bhagirathi is known as Hooghly and forms the boundary between 24-Parganas (North) and Hooghly district.

(8) MAYURAKSHI-BABLA

Mayurakshi originates from the high lands of Santhal Parganas. It is the main river in Birbhum district. Carrying flows of different tributaries, it outfalls into Hijol Beel of Murshidabad district. Babla takes off from the Beel and drains into Bhagirathi.

(9) AJAY

It originates from the hills near Deoghar in Bihar. The principal tributaries of this river are Patro, Janiti, Darua, Kunoor and Hinglow.

(10) DAMODAR

It originates from the Palamoun hills in Bihar. The river bifurcates into two channels at Beguahana. The main flow passes through Mundeswari Channel and discharges into Rupnarayan. The other one Amta Channel carries discharge during high floods and outfalls into Hooghly.

(11) DWARAKESWAR-SILABATI-RUPNARAYAN

The lower tidal reach below the confluence of Dwarakeswar and Silabati is known as Rupnarayan. After receiving the main flow of Damodar through Mundeswari and branch of Kangsabati, i.e. old Cossye of Palaspai Khal, it ultimately outfalls into Hooghly. The river is tidal throughout its entire course.

Dwarakeswar originates from the high lands of Purulia district. River Gandeswari rising from Bankura district meets Dwarakeswar near Bankura town receiving waters of other streams like Arkasha, Berai, it enters Hooghly district and meets Silabati to form Rupnarayan.

Silabati originating in Purulia district, receiving water of Joypanda and after traversing through Midnapore district, it meets Dwarakeswar.

(12) KANGSABATI-KALIAGHAI-HALDI

River Kangsabati originating from Purulia district is joined by Kumari in Bankura district. Further down it is joined by the combined stream of

Bhairab, Banki and Tarafeni rivers and thereafter flows through the Midnapore district. After a tortuous course, it bifurcates, the upper branch known as Old Cossye or Palaspai Khal outfalls into Rupnarayan.

River Kaliaghai trickles out from Jhargram P.S. in Midnapore district. Along its journey, it is fed by the flow of tributaries Kapaleswari, Baghai and Chandia. The combined flow meets the another arm of Kangsabati, i.e. New Cossye to form Haldi, which falls into Hooghly.

(13) RASULPUR

It is a river of Contai Sub-Division of Midnapore district formed by the three streams Bagda, Sarpai and Madhakhati and ultimately meets Hooghly.

(14) TIDAL RIVERS OF SOUTHERN WEST BENGAL

Apart from the rivers described earlier within Ganga and Brahmaputra system, there is a group of rivers in southern part of the State which fall in the tidal zone. These rivers mostly lie in the deltaic zone to the east of Hooghlly river popularly known as Sundarbans and form an intricate network with a number of crisscross into connecting channels, thus dividing the land spill channels of Ganga, then upland supply running dry, during winter months. But gradually their offtakes from Ganga have deteriorated and in some cases being cut-off from the river. Now these rivers drain off whatsoever fresh discharge comes country side, thus ultimately draining into Bay of Bengal through one or other of the principal estuaries in the area which are, starting from Hooghly river successively the Bartala of Muriganga or Channel creek, Saptamukhi, Thakuran, Matla, Gosaba, Hariabhanga, Raimongal etc.

The Tolly's Nullah or the Adi Ganga, as it is sometime called as a small but important tidal creek draining into the Hooghly from the left in the vicinity of the city of Calcutta.

1.2.3 SUBARNAREKHA BASIN

The river Subarnarekha though it has every small catchment within this State has got separate entity as it directly falls into the Bay of Bengal. It has its origin in the hills of Chotonagpur Range at an elevation of 609 m. It contains a total areas of 18,951 km^2 in which 13,950 km^2 in Bihar, 2160 km^2 in West Bengal and 3201 km^2 in Orissa. The main tributaries of the river are Kanchi and Kharkai above Chandil in Bihar, Kakhai in Bihar and Orissa and Dolong in West Bengal.

2 RAINFALL

The main rainfall season in this State is the southwest monsoon season during which the entire land (excepting the extreme north, the extreme northeast and extreme south) gets 75% of the annual rainfall. The Gangetic Plains of West Bengal gets 78% of its annual rainfall during the four months period, June to September. During the last seventy-five years the dates of onset of monsoon cover West Bengal was spread between last week of May to last week of June and these of its withdrawal between last week of September to second week of October.

2.1 RAINFALL PATTERN

The main channel of Ganga divides West Bengal in 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 'Gangetic West Bengal'. Sub-Himalayan West Bengal is more susceptible heavy rains both in respect of amount as well as in frequency of occurrence. Very heavy rain is more frequent in first two monsoon months (June and July) than in subsequent in 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 sub-divided into two broad zones.

(i) The Himalayan & Sub-Himalayan Region

(ii) The Gangetic Plains.

Himalayan & Sub-Himalayan Regions

The Himalayan and Sub-Himalayan regions comprising districts of Darjeeling, Jalpaiguri, Coochbehar and Northern part of Islampur Sub-Division of West Dinajpur district of high intensity of rainfall from 200 cm to over 400 cm about 80% which is found to occur during the monsoon season from June to September. On the average, Darjeeling, Coochbehar and Jalpaiguri get 114, 112 and 110 rainy days respectively in a year. The monsoon generally follows a northernly tract to ultimately break up against Eastern Himalayan causing very heavy rainfall and thereafter through of low pressure under break monsoon conditions, it shifts northwards to the Himalayan foot hills. It has been found that a precipitation to the tune of 200 to 300 mm in 2 hours is not unusual while in more than forty occasions of rainfall of 250 mm and above have been registered during 1891-1965.

Gangetic Plain

The Gangetic Plain, which constitutes the major portion of the State, can be further sub-divided into the following sectors on the basis of average rainfalls.

Sector-I Comprising the district of Bankura, Birbhum, Murshidabad and Burdwan which receive an average rainfall between 1140 mm and 1400 mm.

Sector-II Consisting of the districts of Nadia, Hooghly, Western portion of West Dinajpur, Midnapore and North 24-Parganas having an average annual rainfall between 1400 mm and 1650 mm.

Sector-III Comprising Howrah, Eastern portion of West Dinajpur, South 24-Parganas and Midnapore districts which register an average annual rainfall between 1650 mm and 1900 mm.

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

The rainfall data as collected from Indian Meteorological Department for the districts is shown in Annexure-I (Sheet No-1/12 To 12/12).

3

REPORT ON FLOOD CAUSED BY CYCLONE AND HIGH INTENSITY OF RAINFALL IN WEST BENGAL DURING THE FLOOD PERIOD OF 1999

The State of West Bengal suffered due to cyclone synchronised with high intensity of rainfall during the monsoon months (i.e. from June to October 1999).

Like previous years a depression was formed at Bay of Bengal and a cyclonic storm developed and passed over Sundarban area on 10.6.99 and continued up to 11.6.99 causing heavy devastation to the Sundarban areas in the district of South & North 24-Parganas. Due to high wind speed accompanied with heavy rains, most of the rivers like the Thakuran, the Matla, the Bidya, the Muriganga and the Hooghly were also in spate and the waves of the rivers raised between 1.50 m to 2.00 m which damaged in parts of Sundarbans in the district of North & South 24-Parganas.

In the second spell, a low depression concentrated over the river Kaliaghai and the Subarnarekha basin in between 6th and 8th August, 1999 as a result unprecedented rainfall was occurred in the Kaliaghai, Kapaleswari and Subarnarekha basin areas which caused flood of high magnitude (i.e. much higher than extreme danger level in the Kaliaghai river system).

Due to heavy rainfall in the State of Uttar Pradesh, Bihar and the upper catchment of Mahananda, a heavy precipitation was received by Ganga and Fulahar branches caused inundation to the unprotected areas of Malda, and the Malda Town was constantly threatened due to abnormal rise of water causing heavy damages to the protection works and spurs from the last week of August to 1st week of October, 1999. The Ganga and Fulahar ruled above danger level for almost from last week of August till first week of October. The river level varied between danger and extreme danger level sometime crossing even the extreme danger level mark.

In the last week of August, 1999 the district of Coochbehar, Jalpaiguri and Darjeeling experienced high rainfall varying between 100 mm to 250 mm in 24 hours for about three days resulting heavy discharge passing through the rivers of the districts causing wide spread inundation and bank erosion including damages to spurs in the districts of Coochbehar, Jalpaiguri and Darjeeling (Siliguri).

In the 3rd week of September, 1999 a low pressure developed and remained stationery in the Gangetic West Bengal from 23.9.99 to 28.9.99 (noon) causing widespread rain in all the districts with high precipitation during 24th to 29th September, 1999. The low depression trough thereafter shifted to eastern part of North Bihar and Malda, North and South Dinajpur districts of West Bengal causing heavy precipitation in these districts. The high precipitation resulted very high discharges in the rivers of the Mayurakshi, the Ajay, the Damodar and the Barakar, the Kangsabati and the Ganga. The dams on the Mayurakshi, the Kangsabati and the Damodar become full after peak flood routing and heavy release had to be made thereafter causing widespread damages and inundation in the districts. The affected districts were Purulia, Birbhum, Burdwan, Howrah, Hooghly, Murshidabad and Nadia. The rivers of Uttar and Dakshin Dinajpur districts were also in high spate causing severe damages to flood embankments of these rivers.

In between 17th and 19th October 1999 another low depression developing to a cyclonic storm causing heavy rainfall in the Gangetic West Bengal which ultimately proceeded to North Bengal via Bihar plateau. Due to its influence another flood occurred in the river systems of the Kangsabati, the Mayurakshi and the Damodar. The wide spread rains and flood release from the Dams, the districts of Birbhum, Murshidabad and Nadia which were already resting under flood, were again flooded.

In between 24th and 26th of September, 1999 constant heavy rain ranging from 145 mm to 192 mm was occurred in Calcutta and its suburban areas resulting water logging at several places in Calcutta (like Lake Town, Bangur, Tiljala, Joka etc.) for a period of 10 to 15 days. The depth of submergence varies from 1.5 m to 2.5 m.

Drainage through the channels like Lower and Upper Bagjola Khal, S.W.F. Channel, D.W.F. Channel, T.P. Channel etc. were hampered due to constant high ruling level at the outfall of the river Ganga, Bidyadhari, Kultigong etc.

DISTRICT : 24-PARGANAS (SOUTH & NORTH)

I. The total territorial area of these two districts are 14,136 sq.km out of which 4911.50 sq.km (0.791 million hectares) has fallen in Sundarbans area. The Sudarbans consist of the coastal belt of the Bay of Bengal on the southern part of the State of West Bengal. The rest portion of Sundarbans, i.e. 12,720 sq.km (1.279 million hectares) has fallen in Bangladesh. It forms part of the Gangetic Delta which has been built by deposition of silts, carried down by the Ganges and Brahmaputra River System bounded by River Hooghly on the West and Padma-Meghna on the East. The Sundarbans areas fallen in India are protected by marginal embankment of a total length of about 4102.32 km including 3500 km embankment (earthen embankment 3,577.21 km and armoured embankment 525.11 km) and also there are 944 numbers of sluices in this area. The earthen embankments often suffer heavy damages especially during high tide period of flood season combined with blowing of wind with high velocity, which is a common phenomenon in this Sundarban zones.

However, during the period on 10.6.99 and 11.6.99 widespread depression on Bay of Bengal reached the Sundarban areas and generated wind in just with high speed accompanied by rains. This storm is reported to have caused a rise in the water level by about 1.50 m to 2.00 m in the rivers of the area like Thakukran, Matla, Bidya, Saptamukhi, Gomor, Hooghly, Muriganga etc. This gusty wind caused damages in Sundarbans both in the districts of North and South 24-Parganas, generating high waves which overtopped embankment (both earthen and armoured). In some places, the brick blocks used in armouring works were displaced and breaches in the embankments were caused due to incessant synchronised with high tide during the period from 22.9.99 to 28.9.99. Damages mainly occurred on the Sundarban embankment (3500 km) in South & North 24-Parganas.

A synopsis of damages of the two districts are given below :

(A) **NORTH 24-PARGANAS**

Out of total length of Sundarban Embankment :-

(i)	Total Length of severely Damaged Embankment	--	13.21 km
(ii)	Total Length of partly Damaged Embankment	--	15.92 km
(iii)	Total Length of damaged Protection Work	--	4.50 km
(iv)	Total Numbers of Damaged Sluices	--	15 Nos.
(v)	Total Area Inundated	--	143.42 sq. km.
(vi)	Total Cost required for the Restoration Works	--	125.25 Lakhs

(B) **SOUTH 24-PARGANAS**

Out of total length of Sundarban Embankment :-

(i)	Total Length of severely Damaged Embankment	--	122.94 km
(ii)	Total Length of partly Damaged Embankment	--	38.31 km
(iii)	Total Numbers of Breaches Occurred	--	96 Nos.
(iv)	Total Length of washed out of Embankment	--	12.887 km
(v)	Total Length of Damaged Protection Work	--	20.10 km
(vi)	Total Numbers of Damaged Sluices	--	29 Nos.
(v)	Total Area Inundated	--	229.53 sq.km
(vi)	Total Cost required for the Restoration Works	--	477.75 Lakhs

II **BAGJOLA KHAL**

This Khal acts a vital role in draining out of accumulated water due to precipitation. It starts from Barrackpore (0.00 km) and meets to Kultigong (59.518 km) by crossing the B.T. Road, Sealdah-Barrackpore Railway Line, Sealdah-Bongaon Railway Line, Jessore Road, V.I.P. Road etc. and passing through many thickly populated towns and villages.

The Bagjola Khal is Sub-divided in two reaches :

(a) One reach is "*Upper Bagjola Khal*" from Dunlop Railway Bridge to V.I.P. Road of total length 30.70 km.

(b) Other reach is "*Lower Bagjola Khal*" from V.I.P. Road to Kultigong of total length 28.818 km

(a) **UPPER BAGJOLA KHAL**

Total catchment area of Upper Bagjola Khal is 49.21 sq.km out of which 11.02 sq.km was inundated at different places due to heavy precipitation during the period from 24.9.99 to 1.10.99 under P.S. Kamarhati, Baranagar, Dum Dum and Lake Town in North 24-Parganas district. Cost required for flood fighting works would be of Rs. 0.05 lakhs.

(b) **LOWER BAGJOLA KHAL**

Total catchment area of Lower Bagjola Khal is 115.00 sq.km out of which 82.00 sq.km was inundated at different places due to heavy precipitation during the period from 24.9.99 to 1.10.99 under the P.S. Bhangore, Rajarhat and Haroa. Embankment at same places washed out (0.10 km), severely damaged (0.50 km), partly damaged (1.30 km), slips and banks erosion were occurred at many places (18.00 km) and also 20 nos of sluices/structures were damaged in North 24-Parganas district. Cost required for restoration of flood damaged works will be of Rs. 8.00 lakhs.

III Inundations were occurred at about 23.40 sq.km at different places in the catchment area of Nowi Khal, Khardah Khal, Fatesha Khal, CC' Branch Khal under the P.S. of Rajarhat, Barasat, Khardah and Airport in North 24-Parganas district. Cost required for installation and operation of Pumps at different places at different period during flood '99 will be of Rs. 4.20 lakhs.

IV Inundations were also occurred at about 54.06 sq.km at different places in the catchment area of Begore Khal, T.P. Basin, T.P. Main Khal closure under the P.S. Behala, Maheshtala, Jadavpur, Kasba and Tiljala in the district of South 24-Parganas. Also severely damaged (4 km) and partially damaged (2.43 km) of embankment at some places were happened. Total cost required for the restoration works will be of Rs. 6.08 lakhs.

V Some areas of Bongaon Sub-Divisional Town in North 24-Parganas district and its surrounding areas were inundated by the influence of water of River Ichamati due to heavy rainfall etc.

VI 3 Nos. breaches were occurred at Sealdahgong. Also due to heavy precipitation from 22.9.99 to 27.9.99 the basin area of the river Ichamati, Jamuna and Sealdahgong were waterlogged and about 20 sq.km were inundated due to breach. 3 Nos. structures were damaged. As a result the standing paddy of a large area had been affected. The cost involved for restoration of the flood damaged works at these places will be of Rs. 10.00 lakhs.

VII (a) Inundations were occurred at about 1.00 sq.km in the basin areas of the river Bager Khal and Ichapur Khal under the P.S. Bizpur and Nowapara of North 24-Parganas districts due to heavy precipitation on 24.9.99 & 25.9.99. Also sluice gate of Ichapur, Babunpur and Shyamnagar were damaged and 0.12 km embankment partially damaged and 0.21 km slips/bank erosions were occurred. The cost for such restoration works will be required of Rs. 17.40 lakhs.

(b) Inundations were also occurred at about 51.25 sq.km in the basin areas of the river Monikhali, Alampur, Balarampur and Kantakhali under the P.S. Moheshtala, Metiabruz, Budge-Budge, Thakurpukur, Bishnupur, Nodakhali and Falta of South 24-Parganas district due to heavy rainfall on 24.9.99 & 25.9.99. Also the Monikhali sluice on Diversion Channel and old Monikhali sluice and Poojali sluice gates were badly damaged. The embankment of 0.15 km was partially damaged and 2.635 km slips/bank erosions were occurred. The cost for restoration of these flood damaged works will be required of Rs. 109.60 lakhs.

DISTRICT : HOWRAH

The district of Howrah lies in the Ganga basin, which segmented into Hooghly basin, Damodar basin and Rupnarayan basin. Total territorial area of the district is 1467 sq.km.

The high release from the Dams of D.V.C., the high precipitation in the uncontrolled catchment of the Damodar downstream of Dams and the high tide level at the outfall, i.e. the Rupnarayan, the Hooghly occurred simultaneously

between 23rd and 26th September 1999. The discharge through Durgapur Barrage which was only 47,000 cusecs at 0600 hours on 24.9.99 culminated to a release of 2,18,650 cusecs at 0000 hours on 25.9.99, i.e. within 18 hours discharge below Durgapur Barrage upto Beguahana point was also tremendous and the combined discharge pushed up the levels in the rivers Mundeswari, the Damodar and the Rupnarayan and obviously the river Hooghly was well above the extreme danger level. The level of Amta gauge was above Extreme Danger Level (6.24 m) for about 6 days from 25.9.99 to 30.9.99. As a result a vast area of 82 sq.km of Howrah district was inundated which damaged flood embankments and relevant structures.

A synopsis of the flood damages of the district is given below :

(i)	Total Length of Flood Embankment of the District	--	364.0 km
(ii)	Total Length of breached and washed out Embankment	--	1.50 km
(iii)	Total Length of severely Damaged Embankment	--	6.20 km
(iv)	Total Length of partially Damaged Embankment	--	4.66 km
(v)	Total Length of damaged Revetment Works	--	0.36 km
(vi)	Total Area Inundated in the District	--	82.00 sq.km.
(vii)	Total Cost required for the Restoration Work in the District during Flood 1999	--	523.75 Lakhs

DISTRICT : MIDNAPORE

The main rivers of the district are the Kangsabati, the Silabati and the Rupnarayan. In the 1st spell between 6th and 8th August 1999, the high precipitation exceeding 200 mm at places as recorded on 7.8.99 in the upper catchment of Kaliaghai and Kapaleswari basin areas and the local rainfall 215 mm at Sabang, 151.51 mm at Tamluk, 61.05 mm at Panskura, the water level of the rivers Kaliaghai, Kapaleswari, Baghai and Chandia started rising and crossed the Extreme Danger Level by 3.00 m at Bakrabundh and over 2.20 m at Dehati on 7.8.99. The water level of Kapaleswari rose to 0.75 m above Extreme Danger Level and the water level was more or less unchanged for about 5 days. As a result embankments connected with the above rivers were damaged in several places by the formation of ghoges, slips, overtopping etc. Breaches in

the circuit embankments and the main embankments of river Kaliaghai and Kapaleswari occurred. An area of about 267 sq.km was inundated in P.S. Sabang, Patashpur and Narayangarh due to such breaches and spilling of river Kaliaghai in its right side where there remains no embankment in P.S. Patashpur. In the second spell, the Kangsabati known as Cossye received high discharges from Kangsabati Dam on account of heavy precipitation on the upper catchment of the Dam as well as from the uncontrolled catchment between the Dam and the Kangsabati anicut at Mohanpur near Midnapore. The river gauge at Mohanpur rose to as high as 26.96 m against Extreme Danger Level of 26.36 m at 9 p.m. on 25.9.99 carrying a discharge of 1,33,000 cusecs. The elaborate embankment system constructed by the side of major rivers for protecting Towns, habitations and important State and National Highways breached at several places. The National Highway was overtopped because of these breaches at two places. The Silabati and the Rupnarayan also have elaborate circuit embankments; these were also distressed and damaged at long stretches.

The district again faced flood in the Kangsabati-Silabati system because of heavy rainfall in upper catchment of the Kangsabati in Bihar plateau on 19.10.99, the breaches and damages restored as immediate measures again suffered damages.

A synopsis of flood damages occurred in the district during flood 1999 is given below :

(i)	Total Numbers of Breaches occurred	--	64 Nos.
(ii)	Total Length of washed out Embankment	--	0.625 km
(iii)	Total Length of severely Damaged Embankment	--	12.995 km
(iv)	Total Length of partially Damaged Embankment	--	100.89 km
(v)	Total Length of damaged Protective Works	--	6.53 km
(vi)	Total Length of Slips/Bank Erosion Occurred	--	10.70 km
(vii)	Total No. of Ghoges occurred in Embankment	--	942 Nos.
(viii)	Total No. of Sluices/Structures Damaged	--	85 Nos.
(ix)	Total Area Inundated in the District	--	329.00 sq.km
(x)	Total Length of overtopping of Embankment occurred	--	29.67 km
(xi)	Total Cost required for Restoration of Flood Damaged works of the District	--	817.25 Lakhs

DISTRICT : HOOGHLY

The district Hooghly lies in the Ganga basin, which segmented into Hooghly basin, Damodar basin and Darakeswar left bank (some part). The total territorial area of the district is 3149.00 sq.km.

The wide spread rainfall in the Damodar catchment caused heavy discharge through the Durgapur Barrage. Also due to high tide level of the rivers Bhagirathi, Damodar and Rupnarayan occurred heavy damages to the flood embankment, structures etc. Moreover the discharge through Durgapur Barrage which was only 47,000 cusecs at 0600 hours on 24.9.99 culminated to the release of 2,18,650 cusecs at 0000 hours on 25.9.99, i.e. within 18 hours discharge below Durgapur Barrage up to Beguahana point was also tremendous. As a result, the river Mundeswari a tributary of the river Damodar has spilled its bank causing inundation of a large area of about 600 sq.km. The Darakeswar-Gandheswari catchment also received high rainfall in Bankura district and carried a very high discharge of 1,25,400 cusecs at Bishnupur and hits Arambag areas on 29.9.99. This phenomenon was also a cause of several breaches on the flood protection embankments of the river systems of the district and also damaged the drainage system in the Ghea-Kunti basin. The district suffered from fresh flood occurring because of high release from the Durgapur Barrage due to heavy precipitation in the Bihar plateau during 18th and 19th October 1999. The condition of the already damaged embankments deteriorated further because of this fresh flood.

A synopsis of the flood damages of the district is given below :

(i)	Total Length of Flood Embankment of the District	--	332.65 km
(ii)	Total Length of Breached and Washed Out Embankment	--	1.75 km
(iii)	Total Length of Severely Damaged Embankment	--	9.60 km
(iv)	Total Length of Partially Damaged Embankment	--	18.95 km
(v)	Total Length of Damaged Revetment Works	--	2.54 km
(vi)	Total Area Inundated in the District	--	600.00 sq.km
(vii)	Total Cost required for the Restoration Work in the District during Flood '99	--	224.15 Lakhs

DISTRICT : BURDWAN

The Burdwan district has experienced severe rainfall in the month of June 1999 causing damage to Panagarh Branch Canal. After that due to severe rainfall in the Bihar Plateau during 23.9.99 to 26.9.99, all the rivers ran in spate. The rivers are Bhagirathi, Ajay and Damodar.

Due to continuos heavy precipitation in the upper catchment of river Ajay together with synchronized heavy rainfall in the lower reaches and high discharge release from Hinglo Dam during 23.9.99 to 25.9.99, the water level in the river Ajay crossed the Extreme Danger Level at Budra Gauge Station by 2.5 m. Ajay right embankment was overtopped at many places. Attempts were made to save the embankments from overtopping. The embankment was raised by sand filled polythene bags to check the ingress of flood water. But all were in vain. Such heavy floods washed out Ajay Right Scheduled 'D' Embankment for a length of about 400 m near Bhedia-Bolpur Ferryghat at Purucha at about 0800 hours on 25.9.99.

In addition there have been severe damages and cracks on the Ajay Right Embankment at Beta, Harinathpur, Malocha, Sagarputul, Bilshunda, Bankshibundh, Puruda, Budra, Santra, Fetehpur, Nabagram, Taldanga, Sagira and Kurgram. All are under Aushgram-Mangalkote Block etc.

Due to release of flood water from Maithon and Panchet Dams synchronised with heavy run-off from the uncontrolled catchment up to Durgapur, the release from Durgapur Barrage was as high as 2,16,000 cusecs on 25.9.99. Attempts were made to save the embankment from erosion at Metali, Jamalpur etc. by sand filling gunny bags. It was luckily possible to save the embankment from breaching. Due to high release from Durgapur Barrage the downstream protection work of the Anderson Weir at Randiha has been badly damaged which should be immediately repaired for safety of the structures before next flood.

The river Bhagirathi also crossed the Extreme Danger Level by 0.72 m at kalna and Katwa causing severe damages to the existing protection work and inundated the blocks, viz. Purbasthali - I & II, Nabadwip and Kalna.

A synopsis of the flood damages of the district occurred during the year 1999 is given below :

(i)	Total Numbers of Breaches occurred	--	1 No.
(ii)	Total Length of washed out Embankment	--	0.50 km
(iii)	Total Length of severely Damaged Embankment	--	14.20 km
(iv)	Total Length of partially Damaged Embankment	--	25.70 km
(v)	Total Length of damaged Protective Works	--	26.28 km
(vi)	Total Length of Slips/Bank Erosion occurred	--	12.10 km
(vii)	Total No. of damaged Structures/Sluices	--	3 Nos.
(viii)	Total Inundated Area of the District	--	27.86 sq.km.
(ix)	Total Cost required for Restoration of Flood Damaged works during 1999 of the District	--	350.35 Lakhs

DISTRICT : PURULIA

Total territorial area of this district is 6259 sq.km. The Purulia district which lies in the catchment of the river Kangsabati and the Subarnarekha received heavy rainfall from 23rd to 25th September 1999. Total rainfall in the district from 1.6.99 to 13.10.99 was 1190.00 mm as per record of IMD, Alipore. On account of unprecedented rainfall in the catchment one of the Dyke portion of Keshto Bazar Dam was breached the canal system of minor and medium irrigation schemes in Purulia subjected to extensive damages. Also due to huge rainfall resulting in very high surface run-offs and landslides in hill caused wide spread damages to 16 irrigation schemes in the Purulia district. The damages were in the form of: (1) Breach in Dam, (2) Breaches in Canals, (3) Erosion in Canal Banks, (4) Earth deposition in Canal Beds, (5) Erosion of flanks and formation of depression in approach and Service Roads and (6) Damages to structures and buildings etc.

A statement showing the flood damages occurred in the District is given below :

(i)	Total Numbers of Breaches occurred in Dam, Dyke & Canal	--	344 Nos.
(ii)	Total Length of Breaches occurred	--	1.558 km
(iii)	Total Length of severely Damaged Canal	--	0.015 km
(iv)	Total Length of partially Damaged Canal	--	34.80 km
(v)	Total No. of Structure Damaged	--	32 Nos.
(vi)	Total No. of Slips causing damages to Canal	--	450 Nos.
(vii)	Total Cost involved for Restoration of Flood Damaged Works during 1999 of the District	--	175.00 Lakhs

DISTRICT : NADIA

In the district of Nadia, the main river is Bhagirathi/Hooghly having a total route of 187 km. Besides entire river length of Jalangi (206 km) and Churni (58 km) run through the district. There are also rivers like Padma, Mathabhanga (19 km), Ichamati (68 km) which run partly in Nadia and partly in other district/country.

This year the flood situation began deteriorating since 24.9.99 following incessant rains in the district, especially in the upper catchment area. On the same day, the river Bhagirathi was flowing 37 cm above the Extreme Danger Level. From 24.9.99 Tilpara Barrage started discharge from 34,000 cusecs and reached up to 2,10,000 cusecs on 25.9.99. Due to heavy discharge from rivers Ajay, Brahmani, Dwaraka and Bhagirathi along with the Barrage discharge the condition in Nadia started deteriorating. Moreover, continuous rise of Padma river water rivers Churni, Jalangi and Ichamati started rising fast. This huge discharge could not withstand the thrust and breached at two points at 1600 hours on 26.9.99. The spill water through the breach inundated nearly 58 sq.km area mainly in Kaliganj Block. There are also incident of damages of existing protection work at Prachin Mayapur, Boyra, Tarapur etc. The special feature of flood in the district Nadia is that Bhagirathi at Swarupganj stands above Danger Level for 87 days and above Extreme Danger Level for 57 days. The reason for such prolonged high level was the return of huge accumulation spilled water and run-off from upstream catchment area over a long time. Moreover the Jalangi and the Churni remains in spate following high rise of water level of river Bhagirathi at their outfall zones and same of the river Padma at their off-taking point. During this sandwiched condition both the rivers swell and inundate huge area on their banks. The condition added woe to the people in stagnant rainwater in Nabadwip and Krishnanagar. In all an area of 2000.00 sq.km in the district out of total area of 3927.00 sq.km was inundated during the flood of 1999. The flood condition of the district Nadia had further been deteriorated due to tidal-bore on 25.9.99 and 26.9.99. Because of high precipitation between 18.10.99 and 19.10.99 in upper catchment area of the Mayurakshi and subsequent high release down Tilpara Barrage the district was again inundated by a fresh flood. As a result, the already

damaged flood embankment and relevant structures suffered further damages. Also the tide level of Hooghly was high adding more distress to the people and great damage to flood embankments and structures. Total rainfall of the district (from 1.6.99 to 13.10.99) was 1571.00 mm as per I.M.D Report.

A synopsis of the flood damages of the district is given below :

(i)	Total area of the District	--	3927.00 sq.km
(ii)	Total Numbers of Breaches occurred	--	22 Nos.
(iii)	Total Length of washed out Embankment	--	1.48 km
(iv)	Total Length of severely Damaged Embankment	--	2.30 km
(v)	Total Length of partially Damaged Embankment	--	52.30 km
(vi)	Total Length of damaged Protective Works	--	4.98 km
(vii)	Total Length of Slips/Bank Erosion occurred	--	2.70 km
(viii)	Total No. of damaged Structures/Sluices	--	2 Nos.
(ix)	Total Inundated Area of the District	--	2000.00 sq.km
(x)	Total Cost required for Restoration of Flood Damaged works during 1999 of the District	--	430.00 Lakhs

DISTRICT : BIRBHUM

The total territorial area of the district is about 4545 sq.km. The river Mayurakshi, the Siddheswari, the Noon-Beel and the Ajay originating from the Bihar have caused wide spread flood in the district of Birbhum as happened in the district of Murshidabad.

Also due to heavy precipitation in the catchment of the Dam at Massanjore from 23.9.99 to 25.9.99, the reservoir level started rising and attended the highest ever level of 403.10 m on 24.9.99. Releases from the Massanjore Dam had to be resorted to release from the Dam, combined with the discharge of the Siddheswari-Noon Beel having a heavy precipitation in the catchment worsened the situation further and the discharge from the Tilpara Barrage reached the peak of 2,10,680 cusecs.

The catchment of the river Hinglow, a small tributary of the Ajay also recorded heavy precipitation. The discharge through the Hinglow Dam located in P.S. Khairasole; district Birbhum rose to 57,000 cusecs at 12.30 hours on 24.9.99. The discharge down Tilpara Barrage crossed 1,00,000 cusecs at 16-30

hours on 24.9.99 and reached the peak of 2,10,680 cusecs at 02.00 hours on 25.9.99. Because of heavy discharge through the Tilpara Barrage, the Mayurakshi right and left embankments were breached at many places inundating large areas in this district. The Ajay also recorded the peak discharge of 3,57,756 cusecs causing unprecedented rise in the water level of about 42.32 m at Gheropara against Extreme Danger Level of 40.016 m and overtopped left embankment extensively and caused several breaches namely Ferryghat, Mohuli, Natungram, Palita and Rasui on the left embankment causing widespread inundation in the P.S. Nanur, Bolpur and Labhpur in the district.

The catchment of the Mayurakshi, the Ajay and the Bramhani, a tributary of the Mayurakshi, were again subjected to heavy precipitation during 24 hours ending on 8.00 hours on 19.10.99, a very unusual weather situation in this part of the year.

The river level of the Ajay again rose a very high at different places. The people of the flood affected areas were subjected to acute distress due to repeated inundation, though no new breaches were reported. The cost of restoration of flood damages occurred in the district will be of Rs. 1150.00 lakhs approximately.

DISTRICT : MURSHIDABAD

The district Murshidabad is the northern most district of Presidency Division of West Bengal comprising of an area 5324.00 sq.km. It is interlaced and drained by a group of rivers and rivulets like the Ganga and its tributaries, Bhagirathi, Bhairab, Jalangi, Mayurakshi, Dwarka, Brahmani, Pagla, Bansloi etc. Average rainfall of the district during monsoon period of this year, i.e. from June to 13th Oct 1999 as per I.M.D was 1719.00 mm.

The District has a set of rivers originating from Bihar plateau and joining the Bhagirathi, which is the main drainage artery. Another set of rivers originates from the Ganga-Padma and traverses across the district to drain through the Bhagirathi. Of the rivers the Mayurakshi received heavy rainfall between 23.9.99

to 25.9.99 causing unprecedented rise of water level in the reservoir of Messanjore Dam exceeding the Conservation Level by 1.67 m (5.50 ft). Heavy dam release was made. The uncontrolled catchment of the Mayurakshi especially of the rivers Siddheswari and Noonbeel also received heavy precipitation during this period. The combined discharge passing through Tilpara Barrage exceeded 1,00,000 cusecs from 24.9.99 at 1630 hours and quickly rose to as high as 2,10,860 cusecs on 25.9.99 at 0200 hours. The Kandi Sub-Division at the downstream was completely inundated. The flood embankments, the bridge approaches, roads were breached and washed out. The Sub-Division was cut off from the rest of the State for more than 15 days. The other rivers Bhairab and Jalangi originating from the Ganga-Padma were also in spate causing extensive bank spilling inundating their basins to a large extent. The unprecedented flood situation caused heavy damages to flood embankments, its protection and anti-erosion works of the Bhagirathi and the Ganga-Padma.

Further on 18.10.99 and 19.10.99 high precipitation occurred in the Bihar plateau resulting high run off and subsequent flood in the Mayurakshi. The spillway discharge of the dam again rose to about 76,860 cusecs which when carried down of Tilpara Barrage rose to 85,050 cusecs and caused further damages to already devastated Kandi Sub-Division and other flood embankments of the Mayurakshi and the Bhagirathi.

As a whole a vast area covering the blocks, viz. Kandi, Khargram, Bharatpur-I & II, Barwan, Beldanga-I & II, M.J. Block, Bhagawangola I & II, Hariharpara, Nowda, Jalangi, Bharampur, Raninagar-I, Domkal, Nabagram and Farakka were affected by flood during this monsoon. The Municipalities such as Dhulian, Jangipur, Kandi and Ajimganj–Jiaganj were also affected by flood drainage congestion.

A synopsis of flood damages of the District is giver below :

(i)	Total Length of Flood Embankment of the District	--	422.00 km
(ii)	Total Length of breached and washed out Embankment	--	17.17 km
(iii)	Total Length of severely Damaged Embankment	--	7.10 km
(iv)	Total Length of partially Damaged Embankment	--	7.20 km
(v)	Total No. of Sluices & Structures damaged	--	20 Nos.
(vi)	Total Inundated Area in the District	--	1850 sq.km
(vii)	Total Cost required for the Restoration Works in the District during Flood of 1999	--	2327.80 Lakhs

DISTRICT : MALDAH

The total territorial area of this District is 3733 sq.km. The Ganga on the downstream of Maharajpur in Bihar flows on the right side of Bhutnidiara and takes a sharp turn from Rajmahal and then enters the district Maldah, the deep channel more or less hugging the bank line between Manikchakghat and Panchanandapur. The river has another flow hugging the left bank of Dakatiachar (a charland of recent formation near Bhutnidiara). This channel is gradually developing. The erosion problem of Maldah District along left bank of the river Ganga upstream of Farakka Barrage Project has grown acute with years.

The Ganga and the Mahananda are two major rivers of the district. From the beginning of this flood season, this district suffered due to high discharges passing through the rivers. The heavy precipitation in the States of Uttar Pradesh and Bihar as well as Sub-Himalayan West Bengal and Bihar are the cause of flood this year in 1999. This year total rainfall in the district is 2434.00 mm (from 1.6.99 to 13.10.99) which is more than 42% excess over and above the total rainfall of the last year. As a result, due to high discharges through the Ganga and the Mahananda (Fulahar Branch) caused severe bank erosion in many places of both the rivers causing extensive damages to the anti-erosion works and flood embankments. In the last week of September 1999, Maldah district received high intensity rainfall accompanied by gales on account of the low pressure passing over the area. This high precipitation inundated a major part of the district including Maldah Town. Normal drainage could not be affected due to high ruling levels of all the rivers, i.e. the Ganga, the Mahananda (Fulahar) and a large area of the district remained waterlogged.

This district has 255.92 km of flood embankment. The area under P.S. Harishchandrapur, Ratua, Kharba, Gazol, Englishbazar, Maldah, Manickchakghat and Kaliachak were affected by flood during 1999.

A brief description of different types of damages under this district during flood of 1999 is giver below :

(i)	Total No. of breaches occurred	--	21 Nos.
(ii)	Total Length of washed out Embankment	--	3.45 km
(iii)	Total Length of severely Damaged Embankment	--	48.16 km
(iv)	Total Length of partially Damaged Embankment	--	48.60 km
(v)	Total Length of damaged Protection Works	--	3.30 km (app.)
(vi)	Total No. of Structure damaged	--	33 Nos.①
(vii)	Total Area Inundated in the District	--	416.50 sq.km
(viii)	Total Length of Slips/Bank Erosion occurred	--	0.33 km②
(ix)	Total Amount required for Flood Restoration Works of the District during 1999	--	700.50 Lakhs

① Spur : 6 Nos. + Sluice and others : 27 Nos.
② 0.33 km + in 5th and 6th Retired Embankment and in Bhutnidiara Circuit Embankment at Kaliachak and Manikchak etc. along river Ganga

DISTRICT : UTTAR DINAJPUR

The major rivers of the district are Dauk, Mahananda, Nagar, Kulik, Gamari, Sui, Tangon and the Chiramati. The district experienced heavy precipitation on account of shifting of the low pressure from Bihar plateau towards North-East direction. The rainfall recorded in Raiganj Town on 25.9.99 was 260 mm, at the same time on account of high ruling level of the rivers like the Mahananda, the Dauk, the Nagar, the Kulik and the Sui, the southern part of the district become waterlogged from 27.9.99 to 30.9.99. This has caused wide spread damages to the flood control embankments and structures. Several breaches have also occurred in the circuit embankments. As the intensity of rainfall at sometime was very high, huge area under P.S. Itahar, Raiganj, Kaliaganj and Islampur was inundated, people of the area had lot of sufferings and to get rid off some embankments were cut namely Birnagar embankment, Ranipur embankment, Kanchan Beel embankment in P.S. Itahar and on Madhupur and Majihar embankment in P.S. Kaliaganj.

The district experienced flooding of its rivers again between 19.10.99 and 20.10.99.

A synopsis of the flood damages of the district is given below :

(i)	Total Length of Flood Embankment in the District	--	98.00 km
(ii)	Total Length of breached and washed out Embankment	--	0.69 km
(iii)	Total Length of severely Damaged Embankment	--	24.78 km
(iv)	Total Length of partially Damaged Embankment	--	30.93 km
(v)	Total Inundated Area in the District	--	458.00 sq.km*
(vi)	Total Cost required for Flood Restoration Works of the District during 1999	--	300.50 Lakhs

* (Out of total area of North & South Dinajpur Districts = 5858 sq.km)

DISTRICT : DAKSHIN DINAJPUR

There are four major rivers namely river Atrai, Punarbhaba, Tangon and Jamuna in this district. Beside these, there are number of drainage channels locally named as "Kharis". All these rivers and most of the Kharies originated from Bangladesh after flowing through this district again enter in to Bangladesh. Due to high precipitation and resultant flood as that of North Dinajpur the entire district including Balurghat Town was inundated. The high ruling level of the major rivers of this district, i.e. the Atrai, the Punarbhaba, the Jamuna, the Tangon etc. prolonged the waterlogging of this district and also caused wide spread damages to the flood control embankments and structures. The district experienced flooding of its rivers again between 19th & 20th October 1999.

A synopsis of the flood damages of the district is given below :

(i)	Total Length of Flood Embankment in the District	--	75.48 km
(ii)	Total Length of breached and washed out Embankment	--	0.50 km
(iii)	Total Length of severely Damaged Embankment	--	2.28 km
(iv)	Total Length of partially Damaged Embankment	--	24.84 km
(v)	Total Inundated Area in the District	--	817.94 sq.km*
(vi)	Total Cost required for Flood Restoration Works of the District during 1999	--	129.75 Lakhs

* (Out of total area of North & South Dinajpur Districts = 5858 sq.km)

DISTRICT : JALPAIGURI

The district of Jalpaiguri is situated at the South Himalayan side of Bhutan Hills. The major river, i.e. the Teesta of Bramhaputra basin originates from Sikkim Hills and after flowing through Darjeeling district flows through the district of Jalpaiguri and Coochbehar and enters into Bangladesh. All other major rivers of the Bramhaputra basin like Torsa, Jaldhaka, Kaljani, Raidak-I & II and Sankosh also originate from the Bhutan Hills. The major problem with these rivers during heavy rains is the deposition of boulders, cobbles, pebbles and silts coming down from Bhutan Hills. Also due to extraction of minerals and deforestation in Bhutan Hills, these deposition and siltation give rise in filling up of river beds and consequent avulsions and shifting of the channels on either bank and causing severe bank erosions. The average annual rainfall in the district is of the order of 3500 mm. There was heavy rainfall during the period of 01.07.99 to 12.07.99 and in the 3rd week of August 1999. On 09.07.99 the rainfall at Jalpaiguri was 474 mm which was a record rainfall crossing the previous record of 390 mm on 8th July 1892. This year the rainfall up to 15.10.99 is about 4100 mm. Because of this heavy rain and flood in this year heavy damages occurred to the embankment structures. The cost of flood fighting and flood restoration works will be required of Rs. 740.00 lakhs approx.

DISTRICT : DARJEELING
(SILIGURI MAHAKUMA PARISHAD AREAS)

The rivers Mahananda, Balason, Buri-Balason and Mechi etc. all under Ganga basin fall within the Jurisdiction of Siliguri Mahakuma Parishad under Darjeeling district. The river Mechi originates from Darjeeling Hills, flows through the border of West Bengal and Nepal; the left bank of river Mechi is under the jurisdiction of West Bengal and has been damaged during flood of 1999. The river passing through the plains of West Bengal meets river Mahananda in Bihar near Katihar. The rivers Balason and Buri-Balasan, which also originate from Darjeeling Hill flowing through plains of Siliguri Sub-Division, meet river Mahananda on the upstream of Fulbari Barrage.

River Mahananda, which also originates from Darjeeling Hills flowing through the plains, meet river Ganga in the District of Maldah.

Due to heavy rainfall of about 4000 mm up to 15.10.99 against average annual rainfall of 3200 mm heavy damages occurred on both the banks of river Balason, Bur Balason and on the both banks of river Mahananda up to 2 km downstream of Fulbari Barrage and it passes through Bangladesh and again enters India near Bidhanagar. The right bank of river Mahananda which is under Siliguri Mahakuma Parishad has been badly damaged during flood of 1999.

The cost of the flood fighting and proposed flood damage repair works will be Rs. 200.00 lakhs.

DISTRICT : COOCHBEHAR

This district is in the foothills of Himalayan range of Bhutan. The major rivers flowing through this district are Kaljani, Raidak-I & II, Gadadhar, Torsa and Jaldhaka under Bramhaputra basin. These rivers originate from Bhutan hills. Average annual rainfall in the district is of the order of 3500 mm. The main problem of these rivers are heavy bank erosion due to shifting of channels on either bank which is caused due to heavy siltation and debris deposition in the river beds. These debris and silts come from the Bhutan hills. In the period from 01.07.99 to 12.07.99 and in the 3rd week of August there was heavy rainfall, up to 15th of October 1999 the total rainfall is about 3900 mm. Because of the frequent floods in the rivers bank erosions cause heavy loss to agricultural and homesteads land, villages along with damages to bank protective works.

The cost of flood fighting and restoration work will be required of Rs.285.00 lakhs approx.

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF JANUARY 1999

Period from 1.1.99 to 31.1.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	0.00	14.90	- 100
2	Birbhum	0.00	11.20	- 100
3	Burdwan	0.00	13.40	- 100
4	Hooghly	0.00	14.80	- 100
5	Howrah	0.00	15.70	- 100
6	Midnapore	0.00	12.80	- 100
7	Murshidabad	0.00	14.10	- 100
8	Nadia	0.00	12.10	- 100
9	North 24-Parganas	0.00	13.90	- 100
10	Purulia	0.00	15.20	- 100
11	South 24-Parganas	0.80	13.40	- 94
	Total	**0.80**	**151.40**	
	Average	**0.07**	**13.80**	**- 99**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	0.00	8.40	- 100
13	Darjeeling	21.30	14.60	46
14	Jalpaiguri	0.80	5.80	- 86
15	Maldah	0.00	11.50	- 100
16	North & South Dinajpur	0.00	8.90	- 100
	Total	**22.10**	**49.20**	
	Average	**4.40**	**9.80**	**- 68**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF FEBRUARY 1999

Period from 1.2.99 to 28.2.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	0.00	24.10	- 100
2	Birbhum	0.00	16.70	- 100
3	Burdwan	0.00	21.80	- 100
4	Hooghly	0.00	17.80	- 100
5	Howrah	0.00	34.30	- 100
6	Midnapore	3.70	29.40	- 87
7	Murshidabad	0.00	16.30	- 100
8	Nadia	0.00	24.90	- 100
9	North 24-Parganas	0.00	18.80	- 100
10	Purulia	0.00	23.50	- 100
11	South 24-Parganas	0.00	24.40	- 100
	Total	**3.70**	**252.00**	
	Average	**0.34**	**22.90**	**- 99**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	0.00	17.90	- 100
13	Darjeeling	0.00	15.50	- 100
14	Jalpaiguri	0.00	15.10	- 100
15	Maldah	0.00	18.00	- 100
16	North & South Dinajpur	0.00	12.30	- 100
	Total	**0.00**	**78.80**	
	Average	**--**	**15.76**	**- 100**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF MARCH 1999

Period from 1.3.99 to 31.3.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	0.10	26.30	- 100
2	Birbhum	0.00	16.50	- 100
3	Burdwan	0.00	24.70	- 100
4	Hooghly	4.50	27.10	- 83
5	Howrah	0.00	34.80	- 100
6	Midnapore	0.00	32.10	- 100
7	Murshidabad	0.00	21.60	- 100
8	Nadia	0.00	32.30	- 100
9	North 24-Parganas	5.80	32.30	- 82
10	Purulia	0.00	20.60	- 100
11	South 24-Parganas	0.20	32.30	- 99
	Total	**10.60**	**300.60**	
	Average	**0.96**	**27.30**	**- 97**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	0.30	33.50	- 99
13	Darjeeling	9.00	37.70	- 76
14	Jalpaiguri	9.30	38.40	- 76
15	Maldah	0.00	17.60	- 100
16	North & South Dinajpur	0.00	18.40	- 100
	Total	**18.60**	**145.60**	
	Average	**3.70**	**29.10**	**- 90**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF APRIL 1999

Period from 1.4.99 to 30.4.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	0.00	38.70	- 100
2	Birbhum	14.90	29.50	- 49
3	Burdwan	5.10	40.70	- 87
4	Hooghly	1.10	51.60	- 98
5	Howrah	8.40	53.60	- 84
6	Midnapore	8.10	37.60	- 79
7	Murshidabad	31.00	42.40	- 27
8	Nadia	44.00	62.20	- 29
9	North 24-Parganas	3.10	60.60	- 95
10	Purulia	0.00	25.90	- 100
11	South 24-Parganas	0.60	46.20	- 99
	Total	**116.30**	**489.00**	
	Average	**10.60**	**44.40**	**- 77**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	181.00	120.20	51
13	Darjeeling	99.50	84.20	18
14	Jalpaiguri	124.10	130.00	- 5
15	Maldah	6.80	36.30	- 81
16	North & South Dinajpur	26.40	43.10	- 39
	Total	**437.80**	**413.80**	
	Average	**87.60**	**82.80**	**-11**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF MAY 1999

Period from 1.5.99 to 31.5.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	207.30	87.40	137
2	Birbhum	167.30	86.70	93
3	Burdwan	175.70	94.40	86
4	Hooghly	168.20	102.20	65
5	Howrah	290.30	144.30	101
6	Midnapore	282.10	109.20	158
7	Murshidabad	250.90	107.90	133
8	Nadia	160.80	133.00	21
9	North 24-Parganas	153.40	126.10	22
10	Purulia	127.90	42.30	202
11	South 24-Parganas	237.00	117.20	102
	Total	**2220.90**	**1150.70**	
	Average	**201.90**	**104.60**	**102**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	348.50	358.10	- 3
13	Darjeeling	351.20	212.90	65
14	Jalpaiguri	480.20	312.20	54
15	Maldah	122.30	121.90	0
16	North & South Dinajpur	160.20	130.80	23
	Total	**1462.40**	**1135.90**	
	Average	**292.50**	**227.20**	**28**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF JUNE 1999

Period from 1.6.99 to 30.6.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	186.40	210.80	- 12
2	Birbhum	370.40	203.10	82
3	Burdwan	396.80	232.10	71
4	Hooghly	208.70	259.40	- 20
5	Howrah	229.20	303.00	- 24
6	Midnapore	193.60	248.30	- 22
7	Murshidabad	182.80	237.00	- 23
8	Nadia	271.20	247.30	9
9	North 24-Parganas	187.50	286.50	- 35
10	Purulia	183.10	200.20	- 7
11	South 24-Parganas	263.50	289.20	- 9
	Total	**2673.20**	**2716.90**	
	Average	**243.00**	**247.00**	**1**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	551.90	717.70	- 23
13	Darjeeling	555.10	575.90	- 4
14	Jalpaiguri	582.40	613.50	- 5
15	Maidah	379.10	269.40	41
16	North & South Dinajpur	317.80	286.10	11
	Total	**2386.30**	**2462.60**	
	Average	**477.30**	**492.50**	**4**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF JULY 1999

Period from 1.7.99 to 31.7.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	326.40	303.00	8
2	Birbhum	455.00	257 70	77
3	Burdwan	405.60	299.90	35
4	Hooghly	363.50	310.00	17
5	Howrah	407.50	360.90	13
6	Midnapore	411.30	305.00	35
7	Murshidabad	342.80	302.00	13
8	Nadia	480.80	267.40	-80
9	North 24-Parganas	414.10	332.30	25
10	Purulia	321.30	338.00	- 5
11	South 24-Parganas	443.50	355.40	25
	Total	**4371.80**	**3431.60**	
	Average	**397.40**	**312.00**	**15**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	747.70	667.50	12
13	Darjeeling	752.70	771.50	- 2
14	Jalpaiguri	1062.90	819.20	30
15	Maidah	585.20	329.00	78
16	North Dinajpur	400.60	333.30	20
17	South Dinajpur	543.80	732.40	- 26
	Total	**4092.90**	**3652.90**	
	Average	**818.60**	**730.60**	**22**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF AUGUST 1999

Period from 1.8.99 to 31.8.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	358.70	307.00	17
2	Birbhum	398.20	288 80	38
3	Burdwan	348.40	293.50	19
4	Hooghly	273.20	299.50	- 9
5	Howrah	297.90	356.40	- 16
6	Midnapore	406.40	307.70	32
7	Murshidabad	350.70	280.40	25
8	Nadia	405.20	260.70	55
9	North 24-Parganas	403.70	309.20	31
10	Purulia	245.20	323.20	- 24
11	South 24-Parganas	417.60	359.90	16
	Total	**3905.20**	**3095.30**	
	Average	**355.00**	**281.40**	**17**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	933.40	534.30	75
13	Darjeeling	898.80	638.70	41
14	Jalpaiguri	901.40	570.50	58
15	Maldah	583.90	331.30	76
16	North & South Dinajpur	517.60	292.30	77
	Total	**3835.10**	**2367.10**	
	Average	**767.00**	**473.40**	**65**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE, CALCUTTA ALONG WITH PER CENT DEPARTURE FROM NORMAL FOR THE MONTH OF SEPTEMBER 1999

Period from 1.9.99 to 30.9.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	327.90	191.10	72
2	Birbhum	461.50	200.00	131
3	Burdwan	505.80	214.30	136
4	Hooghly	391.80	254.00	54
5	Howrah	441.70	208.00	112
6	Midnapore	408.70	257.30	59
7	Murshidabad	466.20	208.60	123
8	Nadia	355.50	210.70	69
9	North 24-Parganas	464.50	260.00	79
10	Purulia	437.70	248.00	76
11	South 24-Parganas	583.70	272.60	114
	Total	**4845.00**	**2524.60**	
	Average	**440.45**	**229.50**	**92**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	249.20	496.00	- 50
13	Darjeeling	355.80	452.70	- 21
14	Jalpaiguri	277.00	466.80	- 41
15	Maldah	789.70	279.30	183
16	North & South Dinajpur	530.80	245.60	116
	Total	**2202.50**	**1940.40**	
	Average	**440.50**	**388.08**	**37**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE ALONG WITH PERCENT DEPARTURE FROM NORMAL FOR THE MONTH OF OCTOBER 1999

Period from 1.10.99 to 31.10.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	164.90	85.80	92
2	Birbhum	149.90	100.80	49
3	Burdwan	178.40	104.30	71
4	Hooghly	251.00	118.30	112
5	Howrah	140.00	127.80	10
6	Midnapur	230.80	142.80	62
7	Murshidabad	105.60	130.40	- 19
8	Nadia	163.00	107.60	51
9	North 24-Parganas	336.40	120.70	179
10	Purulia	200.20	85.10	135
11	South 24-Parganas	256.80	163.30	57
	Total	**2177.10**	**1286.90**	
	Average	**197.90**	**117.00**	**69**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	308.60	165.90	86
13	Darjeeling	244.10	141.30	73
14	Jalpaiguri	265.50	170.70	56
15	Maldah	169.90	111.20	53
16	North & South Dinajpur	83.00	116.90	- 29
	Total	**1071.10**	**706.00**	
	Average	**214.22**	**141.20**	**51.70**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE ALONG WITH PERCENT DEPARTURE FROM NORMAL FOR THE MONTH OF NOVEMBER 1999

Period from 1.11.99 to 30.11.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	3.60	15.30	- 76
2	Birbhum	25.70	12.20	110
3	Burdwan	15.90	15.00	6
4	Hooghly	2.10	21.70	- 90
5	Howrah	3.90	24.60	- 84
6	Midnapur	20.30	34.30	- 41
7	Murshidabad	10.50	12.60	- 17
8	Nadia	3.30	16.90	- 80
9	North 24-Parganas	1.20	19.80	- 94
10	Purulia	4.40	13.90	- 68
11	South 24-Parganas	10.90	29.20	- 63
	Total	**101.90**	**215.40**	
	Average	**9.30**	**19.60**	**- 53**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	7.00	9.70	- 27
13	Darjeeling	15.10	14.80	2
14	Jalpaiguri	6.20	16.50	- 63
15	Maldah	1.30	12.50	- 89
16	North & South Dinajpur	1.50	13.00	- 88
	Total	**31.10**	**66.50**	
	Average	**6.22**	**13.30**	**- 53.25**

MONTHLY DISTRICTWISE ACTUAL & NORMAL RAINFALL RECEIVED FROM I.M.D., ALIPORE ALONG WITH PERCENT DEPARTURE FROM NORMAL FOR THE MONTH OF DEEMBER 1999

Period from 1.12.99 to 31.12.99

Sl. No.	Name of District	Actual (in mm)	Normal (in mm)	Departure (in %)
1	*2*	*3*	*4*	*5*
Sub-Division : Gangetic West Bengal				
1	Bankura	0.00	3.30	- 100
2	Birbhum	0.00	2.30	- 100
3	Burdwan	0.00	2.80	- 100
4	Hooghly	0.00	3.40	- 100
5	Howrah	0.00	4.10	- 100
6	Midnapur	0.00	2.20	- 100
7	Murshidabad	0.00	2.20	- 100
8	Nadia	0.00	3.60	- 100
9	North 24-Parganas	0.00	2.70	- 100
10	Purulia	0.00	2.20	- 100
11	South 24-Parganas	0.00	3.90	- 100
	Total	**0.00**	**32.70**	
	Average	**0.00**	**3.00**	**- 100**
Sub-Division : Sub-Himalayan West Bengal				
12	Coochbehar	0.50	2.20	- 77
13	Darjeeling	2.70	3.60	- 26
14	Jalpaiguri	0.60	7.10	- 92
15	Maldah	0.00	1.70	- 100
16	North & South Dinajpur	0.00	1.90	- 100
	Total	**3.80**	**16.50**	
	Average	**0.76**	**3.30**	- 76

IMPORTANT RESERVOIR LEVELS & OUTFLOW DATA DURING THE FLOOD SEASON OF 1999

Name of Reservoir : Maithon

Conservation Level : 146.31 m (480.00 ft)
Dead Storage Level : 132.59 m (435.00 ft)

Date	Time	Reservoir Level (in m)	Outflow (in Cumecs)	Remarks
1	*2*	*3*	*4*	*5*
18.06.99	0600	138.34	34.26	-
19.06.99	0600	138.32	31.37	-
27.06.99	0600	139.50	156.14	-
28.06.99	0600	140.43	173.10	-
02.07.99	0600	142.69	154.50	-
03.07.99	0600	142.55	173.07	-
09.07.99	0600	142.50	191.10	-
12.07.99	0600	142.66	190.83	-
15.07.99	0600	144.30	185.64	-
16.07.99	0600	144.45	170.75	-
24.07.99	0600	147.31	434.00	Above Conservation Level
25.07.99	0600	147.22	594.20	Above Conservation Level
30.07.99	0600	147.22	570.10	Above Conservation Level
31.07.99	0600	147.33	600.80	Above Conservation Level
03.08.99	0600	146.10	429.25	-
09.08.99	0600	145.88	265.58	-
12.08.99	0600	145.55	263.53	-
15.08.99	0600	146.27	272.10	-
19.08.99	0600	146.65	270.68	Above Conservation Level
21.08.99	0600	146.52	259.18	Above Conservation Level
26.08.99	0600	146.62	598.39	Above Conservation Level
28.08.99	0600	146.18	696.45	-
31.08.99	0600	145.00	659.44	-
03.09.99	0600	145.09	470.65	-
07.09.99	0600	144.88	184.48	-
08.09.99	0600	144.81	183.58	-
19.09.99	0600	146.07	162.74	-
20.09.99	0600	146.14	171.83	-
24.09.99	0600	146.88	172.88	Above Conservation Level
25.09.99	0600	149.72	1301.83	Above Conservation Level
26.09.99	0600	148.73	2037.07	Above Conservation Level
27.09.99	0600	147.89	1097.30	Above Conservation Level
28.09.99	0600	147.53	518.33	Above Conservation Level
29.09.99	0600	147.43	321.53	Above Conservation Level
09.10.99	0600	147.75	228.68	Above Conservation Level
10.10.99	0600	147.72	168.80	Above Conservation Level
12.10.99	0600	147.57	169.84	Above Conservation Level
13.10.99	0600	147.47	167.52	Above Conservation Level

IMPORTANT RESERVOIR LEVELS & OUTFLOW DATA DURING THE FLOOD SEASON OF 1999

Name of Reservoir : Panchet

Conservation Level : 124.97 m (410.00 ft)
Dead Storage Level : 119.48 m (392.00 ft)

Date	Time	Reservoir Level (in m)	Outflow (in Cumecs)	Remarks
1	*2*	*3*	*4*	*5*
16.06.99	0600	121.33	23.96	-
18.06.99	0600	121.30	43.64	-
24.06.99	0600	122.00	130.62	-
28.06.99	0600	122.48	80.61	-
04.07.99	0600	124.49	125.16	-
05.07.99	0600	124.49	158.66	-
11.07.99	0600	124.98	168.68	Above Conservation Level
12.07.99	0600	125.37	141.55	Above Conservation Level
14.07.99	0600	126.83	210.19	Above Conservation Level
15.07.99	0600	126.12	927.79	Above Conservation Level
24.07.99	0600	126.77	1140.22	Above Conservation Level
25.07.99	0600	126.77	1119.38	Above Conservation Level
30.07.99	0600	127.00	1118.70	Above Conservation Level
31.07.99	0600	126.85	1378.68	Above Conservation Level
03.08.99	0600	124.91	852.07	Above Conservation Level
09.08.99	0600	126.60	995.38	Above Conservation Level
10.08.99	0600	126.25	1259.32	Above Conservation Level
11.08.99	0600	125.82	929.32	Above Conservation Level
22.08.99	0600	125.17	354.44	Above Conservation Level
23.08.99	0600	125.27	348.15	Above Conservation Level
27.08.99	0600	125.59	949.09	Above Conservation Level
28.08.99	0600	125.73	959.68	Above Conservation Level
03.09.99	0600	126.57	955.97	Above Conservation Level
04.09.99	0600	126.32	976.89	Above Conservation Level
07.09.99	0600	126.28	898.03	Above Conservation Level
08.09.99	0600	126.14	648.51	Above Conservation Level
18.09.99	0600	126.66	530.91	Above Conservation Level
19.09.99	0600	126.76	525.56	Above Conservation Level
24.09.99	0600	127.10	526.94	Above Conservation Level
25.09.99	0600	129.69	1240.95	Above Conservation Level
26.09.99	0600	129.97	1257.11	Above Conservation Level
27.09.99	0600	129.05	1699.39	Above Conservation Level
28.09.99	0600	128.18	1401.02	Above Conservation Level
29.09.99	0600	127.49	974.35	Above Conservation Level
09.10.99	0600	127.23	348.15	Above Conservation Level
10.10.99	0600	127.42	436.44	Above Conservation Level
13.10.99	0600	126.62	325.90	Above Conservation Level

IMPORTANT RESERVOIR LEVELS & OUTFLOW DATA DURING THE FLOOD SEASON OF 1999

Name of Reservoir : Tenughat

Conservation Level : 263.66 m (865.00 ft)
Dead Storage Level : 249.02 m (817.00 ft)

Date	Time	Reservoir Level (in m)	Outflow (in Cumecs)	Remarks
1	*2*	*3*	*4*	*5*
18.06.99	0600	257.30	5.13	-
21.06.99	0600	257.30	5.13	-
27.06.99	0600	258.87	64.05	-
28.06.99	0600	259.25	144.68	-
01.07.99	0600	258.78	168.62	-
02.07.99	0600	258.56	189.23	-
11.07.99	0600	257.95	111.28	-
12.07.99	0600	259.26	590.90	-
13.07.99	0600	258.99	520.70	-
14.07.99	0600	258.65	461.11	-
22.07.99	0600	259.84	1122.88	-
23.07.99	0600	258.96	1578.17	-
29.07.99	0600	259.61	670.14	-
30.07.99	0600	259.20	1726.56	-
08.08.99	0600	259.58	1109.08	-
09.08.99	0600	258.89	1409.54	-
10.08.99	0600	258.30	828.54	-
14.08.99	0600	258.18	401.18	-
20.08.99	0600	258.23	376.41	-
21.08.99	0600	258.14	596.53	-
27.08.99	0600	258.44	627.37	-
28.08.99	0600	258.44	793.36	-
01.09.99	0600	258.67	890.30	-
05.09.99	0600	259.23	1118.81	-
07.09.99	0600	258.06	483.30	-
08.09.99	0600	258.10	477.59	-
15.09.99	0600	258.15	451.58	-
16.09.99	0600	258.04	529.15	-
24.09.99	0600	258.03	267.65	-
25.09.99	0600	258.01	437.15	-
26.09.99	0600	257.94	421.34	-
27.09.99	0600	257.89	229.96	-
28.09.99	0600	257.82	211.75	-
29.09.99	0600	257.75	190.79	-
08.10.99	0600	258.65	417.83	-
09.10.99	0600	258.47	654.43	-
12.10.99	0600	258.12	22.89	-
14.10.99	0600	258.42	4.30	-

IMPORTANT RESERVOIR LEVELS & OUTFLOW DATA DURING THE FLOOD SEASON OF 1999

Name of Reservoir : Kangsabati

Conservation Level : 134.11 m (440.00 ft)
Dead Storage Level : 120.40 m (395.00 ft)

Date	Time	Reservoir Level (in m)	Outflow (in Cumecs)	Remarks
1	*2*	*3*	*4*	*5*
19.06.99	0600	122.54	-	-
21.06.99	0600	122.56	-	-
27.06.99	0600	123.06	-	-
28.06.99	0600	123.20	-	-
04.07.99	0600	123.63	-	-
05.07.99	0600	123.66	-	-
11.07.99	0600	124.21	-	-
12.07.99	0600	124.24	-	-
18.07.99	0600	125.13	-	-
19.07.99	0600	125.33	-	-
25.07.99	0600	126.28	84.74	-
26.07.99	0600	126.46	-	-
01.08.99	0600	128.38	-	-
02.08.99	0600	128.60	-	-
04.08.99	0600	128.66	98.99	-
09.08.99	0600	128.50	179.21	-
10.08.99	0600	128.50	196.17	-
11.08.99	0600	128.38	201.94	-
17.08.99	0600	127.57	127.20	-
23.08.99	0600	127.85	-	-
29.08.99	0600	129.43	-	-
30.08.99	0600	129.69	-	-
02.09.99	0600	130.07	163.80	-
03.09.99	0600	130.01	195.39	-
07.09.99	0600	129.72	186.45	-
08.09.99	0600	129.54	212.13	-
18.09.99	0600	129.62	6.59	-
19.09.99	0600	129.72	-	-
20.09.99	0600	129.83	-	-
24.09.99 24.09.99	0600 1500	131.58 -	- 2548.49 (90,000 cusecs)	Maximum observed inflow into Kangsabati Reservoir 2,57,000 cusecs (7277.36 cumecs) on 24.09.99.

Date	Time	Reservoir Level (in m)	Outflow (in Cumecs)	Remarks
1	*2*	*3*	*4*	*5*
25.09.99	0600	133.94	1891.65	-
26.09.99	0600	133.55	1465.84	-
27.09.99	0600	133.58	361.77	-
28.09.99	0600	133.38	465.36	-
29.09.99	0600	133.35	227.46	-
06.10.99	0600	133.79	86.84	-
07.10.99	0600	133.76	110.87	-
12.10.99	0600	133.23	213.90	-
14.10.99	0600	132.88	224.02	-

IMPORTANT RESERVOIR LEVELS & OUTFLOW DATA DURING THE FLOOD SEASON OF 1999

Name of Reservoir : Messanjore

Conservation Level : 121.34 m (398.00 ft)
Dead Storage Level : 106.37 m (349.00 ft)

Date	Time	Reservoir Level (in m)	Outflow (in Cumecs)	Remarks
1	*2*	*3*	*4*	*5*
19.06.99	0600	113.538	-	-
21.06.99	0600	113.538	-	-
27.06.99	0600	116.540	-	-
28.06.99	0600	117.638	-	-
04.07.99	0600	119.140	-	-
05.07.99	0600	119.129	-	-
07.07.99	0600	119.497	46.14	-
12.07.99	0600	119.375	152.22	-
14.07.99	0600	119.619	158.12	-
15.07.99	0600	119.482	459.55	-
20.07.99	0600	119.116	266.18	-
27.07.99	0600	119.131	464.66	-
28.07.99	0600	118.963	5.36	-
01.08.99	0600	118.979	571.15	-
08.08.99	0600	119.162	5.18	-
09.08.99	0600	119.314	-	-
14.08.99	0600	119.956	-	-
16.08.99	0600	119.664	492.72	-
17.08.99	0600	119.631	220.57	-
23.08.99	0600	119.588	238.89	-
26.08.99	0600	119.482	402.90	-
29.08.99	0600	119.238	1058.25	-
31.08.99	0600	119.847	256.53	-
01.09.99	0600	119.604	530.97	-
07.09.99	0600	119.253	23.53	-
09.09.99	0600	119.177	95.29	-
15.09.99	0600	119.908	321.65	-
16.09.99	0600	119.710	430.26	-
24.09.99	0600	119.908	313.64	Above Conservation Level
24.09.99	-	122.830 (1,30,259 cusecs)	3688.49	
25.09.99	0600	121.920	-	Above Conservation Level
25.09.99	-	122.860 (2,08,000 cusecs)	5889.85	Maximum observed inflow into Messanjore Reservoir 2,27,750 cusecs on 25.09.99.

Date	Time	Reservoir Level (in m)	Outflow (in Cumecs)	Remarks
1	*2*	*3*	*4*	*5*
26.09.99	0600	120.335	203.42	-
27.09.99	0600	120.045	448.88	-
28.09.99	0600	120.198	160.44	-
29.09.99	0600	120.213	204.26	-
07.10.99	0600	120.670	165.39	-
09.10.99	0600	120.762	52.14	-
13.10.99	0600	120.579	138.35	-
14.10.99	0600	120.442	135.73	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Sankosh	L.R.P. Crossing	29.06.99	46.95	1000	-
		02.07.99	47.00	1000	-
		13.07.99	47.05	1000	-
Warning Level		20.07.99	46.80	1000	-
		26.07.99	46.70	1000	-
E.D.L. : 49.10 m		29.07.99	46.85	1000	-
D.L. : 48.20 m		11.08.99	46.75	1000	-
		13.08.99	47.30	1000	-
		25.08.99	48.00	1000	-
		26.08.99	47.90	1000	-
		03.09.99	46.80	1000	-
		10.09.99	46.65	1000	-
		16.09.99	46.25	1000	-
		27.09.99	46.25	1000	-
		30.09.99	46.00	1000	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Teesta	Coronation Bridge	26.06.99	147.00	1000	-
		28.06.99	151.00	1000	-
		01.07.99	148.35	1000	-
Warning Level		12.07.99	148.00	1000	-
		19.07.99	147.70	1000	-
E.D.L. : 151.80 m		23.07.99	148.05	1000	-
D.L. : 149.40 m		29.07.99	147.55	1000	-
		10.08.99	147.20	1000	-
		12.08.99	147.95	1000	-
		25.08.99	149.25	1000	-
		26.08.99	151.00	1000	Above DL
		03.09.99	148.30	1000	-
		10.09.99	147.35	1000	-
		17.09.99	147.00	1000	-
		26.09.99	147.90	1000	-
		30.09.99	146.50	1000	-
		08.10.99	147.05	1000	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Torsa	Hasimara	28.06.99	114.75	1000	-
		05.07.99	114.60	1000	-
		12.07.99	114.50	1000	-
Warning Level		19.07.99	115.10	1000	-
		23.07.99	114.90	1000	-
E.D.L. : 116.90 m		29.07.99	114.50	1000	-
D.L. : 116.30 m		10.08.99	114.30	1000	-
		13.08.99	114.25	1000	-
		25.08.99	115.45	1000	-
		26.08.99	116.37	1000	Above DL
		07.09.99	114.40	1000	-
		10.09.99	114.10	1000	-
		16.09.99	114.05	1000	-
		27.09.99	114.25	1000	-
		04.10.99	114.71	1000	-
		07.10.99	113.75	1000	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Jaldhaka	N.H.-31 Crossing	23.06.99	79.30	1000	-
		24.06.99	79.60	1000	-
		07.07.99	79.80	1000	-
Warning Level		13.07.99	79.71	1000	-
		19.07.99	79.76	1000	-
E.D.L. : 80.50 m		23.07.99	78.63	1000	-
D.L. : 80.00 m		29.07.99	79.36	1000	-
		10.08.99	79.55	1000	-
		18.08.99	79.82	1000	-
		25.08.99	80.00	1000	Touched DL
		26.08.99	79.91	1000	-
		06.09.99	79.57	1000	-
		13.09.99	79.48	1000	-
		21.09.99	79.53	1000	-
		27.09.99	79.35	1000	-
		04.10.99	79.35	1000	-
		08.10.99	79.43	1000	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Mansai	Mathabhanga	21.06.99	47.20	1000	-
		25.06.99	47.62	1000	-
		02.07.99	48.35	1000	Above DL
Warning Level		12.07.99	48.20	1000	Touched DL
		20.07.99	47.27	1000	-
E.D.L. : 48.70 m		22.07.99	47.17	1000	-
D.L. : 48.20 m		29.07.99	46.96	1000	-
		05.08.99	46.95	1000	-
		18.08.99	47.65	1000	-
		25.08.99	48.95	1000	Above EDL
		26.08.99	48.25	1000	Above DL
		03.09.99	47.26	1000	-
		10.09.99	47.05	1000	-
		16.09.99	46.90	1000	-
		28.09.99	46.98	1000	-
		05.10.99	46.96	1000	-
		11.10.99	47.02	1000	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Raidak-I	L.R.P. Crossing	29.06.99	44.95	1000	-
		05.07.99	46.70	1000	Touched DL
		08.07.99	44.75	1000	-
Warning Level		20.07.99	46.05	1000	-
		22.07.99	45.75	1000	-
E.D.L. : 47.60 m		29.07.99	45.54	1000	-
D.L. : 46.70 m		11.08.99	44.70	1000	-
		18.08.99	45.65	1000	-
		25.08.99	46.20	1000	-
		26.08.99	46.20	1000	-
		03.09.99	44.65	1000	-
		09.09.99	44.40	1000	-
		21.09.99	44.40	1000	-
		27.09.99	44.50	1000	-
		30.09.99	44.35	1000	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	2	3	4	5	6
Kaljani	Alipurduar	29.06.99	43.20	1000	-
		05.07.99	44.95	1000	-
		12.07.99	44.20	1000	-
Warning Level		19.07.99	43.40	1000	-
		23.07.99	43.20	1000	-
E.D.L. : 45.70 m		02.08.99	42.90	1000	-
D.L. : 45.10 m		05.08.99	42.45	1000	-
		18.08.99	43.95	1000	-
		25.08.99	44.60	1000	-
		26.08.99	44.30	1000	-
		03.09.99	42.80	1000	-
		09.09.99	42.65	1000	-
		21.09.99	42.60	1000	-
		26.09.99	42.55	1000	-
		30.09.99	42.40	1000	-
		11.10.99	42.65	1000	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	2	3	4	5	6
Ganga	Patna	22.06.99	43.22	0600	-
		30.06.99	44.58	0600	-
		07.07.99	45.67	0600	-
Warning Level		14.07.99	46.58	0600	-
		15.07.99	47.10	0600	-
E.D.L. : 49.20 m		28.07.99	46.64	0600	-
D.L. : 48.60 m		01.08.99	48.72	0600	Above DL
		11.08.99	48.33	0600	-
		18.08.99	49.00	0600	Above DL
		19.08.99	48.87	0600	Above DL
		31.08.99	48.54	0600	-
		08.09.99	49.00	0600	Above DL
		09.09.99	49.05	0600	Above DL
		22.09.99	49.11	0600	Above DL
		24.09.99	49.21	0600	Above EDL
		30.09.99	47.54	0600	-
		11.10.99	47.47	0600	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Ganga	Hatidah	22.06.99	35.96	0600	-
		30.06.99	37.15	0600	-
		07.07.99	38.06	0600	-
Warning Level		14.07.99	38.96	0600	-
		16.07.99	39.74	0600	-
E.D.L. : 42.36 m		28.07.99	39.59	0600	-
D.L. : 41.76 m		02.08.99	41.56	0600	-
		05.08.99	41.10	0600	-
		18.08.99	41.87	0600	Above DL
		19.08.99	41.92	0600	Above DL
		31.08.99	41.52	0600	-
		08.09.99	41.91	0600	Above DL
		10.09.99	42.12	0600	Above DL
		22.09.99	42.26	0600	Above DL
		25.09.99	42.47	0600	Above EDL
		30.09.99	40.84	0600	-
		12.10.99	40.64	0600	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Ganga	Manickchak Ghat	30.06.99	20.20	0600	-
		07.07.99	23.47	0600	-
		14.07.99	23.60	0600	-
Warning Level		16.07.99	23.91	0600	-
		27.07.99	23.64	0600	-
E.D.L. : 25.54m		03.08.99	24.98	0600	Above DL
D.L. : 24.69 m		05.08.99	24.95	0600	Above DL
		18.08.99	25.36	0600	Above DL
		20.08.99	25.48	0600	Above DL
		03.09.99	25.40	0600	Above DL
		11.09.99	25.37	0600	Above DL
		13.09.99	25.46	0600	Above DL
		16.09.99	25.25	0600	Above DL
		27.09.99	26.13	0600	Above EDL
		30.09.99	25.45	0600	Above DL
		11.10.99	24.32	0600	

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Ganga	Farakka	23.06.99	17.59	0600	-
		30.06.99	19.60	0600	-
		07.07.99	20.57	0600	-
Warning Level		14.07.99	21.32	0600	-
		16.07.99	21.84	0600	-
E.D.L. : 23.77 m		27.07.99	21.61	0600	-
D.L. : 22.25 m		04.08.99	23.15	0600	Above DL
		05.08.99	23.12	0600	Above DL
		18.08.99	23.64	0600	Above DL
		20.08.99	23.83	0600	Above EDL
		31.08.99	23.84	0600	Above EDL
		03.09.99	23.88	0600	Above EDL
		14.09.99	24.01	0600	Above EDL
		16.09.99	23.78	0600	Above EDL
		27.09.99	24.70	0600	Above EDL
		30.09.99	24.07	0600	Above EDL
		11.10.99	22.59	0600	Above DL

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Ganga	Nurpur	07.07.99	16.93	0600	-
		14.07.99	17.83	0600	-
		15.07.99	18.57	0600	-
Warning Level		28.07.99	18.22	0600	-
		04.08.99	19.64	0600	-
E.D.L. : 21.64 m		05.08.99	19.61	0600	-
D.L. : 21.03 m		18.08.99	20.15	0600	-
		19.08.99	20.25	0600	-
		01.09.99	20.35	0600	-
		03.09.99	20.35	0600	-
		13.09.99	20.39	0600	-
		16.09.99	20.23	0600	-
		27.09.99	21.17	0600	Above DL
		30.09.99	20.81	0600	Above DL
		11.10.99	19.00	0600	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Mahananda	Dangraghat	23.06.99	33.67	0600	-
		29.06.99	35.54	0600	-
		05.07.99	36.08	0600	Above DL
Warning Level		13.07.99	36.45	0600	Above EDL
		20.07.99	35.34	0600	-
E.D.L. : 36.15 m		22.07.99	35.02	0600	-
D.L. : 35.65 m		29.07.99	34.58	0600	-
		11.08.99	34.70	0600	-
		18.08.99	35.47	0600	-
		23.08.99	35.98	0600	Above DL
		27.08.99	36.75	0600	Above EDL
		07.09.99	35.16	0600	-
		09.09.99	34.96	0600	-
		16.09.99	34.55	0600	-
		27.09.99	36.55	0600	Above EDL
		30.09.99	35.19	0600	-
		08.10.99	34.70	0600	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Mahananda	Jhawa	23.06.99	28.14	0600	-
		29.06.99	30.90	0600	-
		05.07.99	31.68	0600	Above DL
Warning Level		13.07.99	32.08	0600	Above EDL
		16.07.99	31.54	0600	Above DL
E.D.L. : 31.90 m		23.07.99	30.84	0600	-
D.L. : 31.40 m		29.07.99	30.46	0600	-
		11.08.99	29.81	0600	-
		18.08.99	31.37	0600	-
		20.08.99	31.55	0600	Above DL
		27.08.99	31.96	0600	Above EDL
		03.09.99	31.06	0600	-
		09.09.99	30.48	0600	-
		16.09.99	30.07	0600	-
		27.09.99	32.02	0600	Above EDL
		30.09.99	31.14	0600	-
		11.10.99	30.23	0600	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Mahananda	Englishbazar	23.06.99	15.07	0600	-
		30.06.99	17.84	0600	-
		07.07.99	18.89	0600	-
Warning Level		14.07.99	20.40	0600	-
		21.07.99	21.39	0600	-
E.D.L. : 23.50 m		23.07.99	21.47	0600	-
D.L. : 22.75 m		29.07.99	20.98	0600	-
		05.08.99	20.44	0600	-
		18.08.99	20.85	0600	-
		25.08.99	21.63	0600	-
		01.09.99	22.39	0600	-
		06.09.99	22.63	0600	-
		09.09.99	22.41	0600	-
		16.09.99	21.81	0600	-
		26.09.99	23.33	0600	Above DL
		04.10.99	23.66	0600	Above EDL
		07.10.99	23.40	0600	Above DL

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Bhagirathi	Katwa	09.06.99	11.46	0600	
		13.08.99	11.43	0600	-
		27.08.99	12.85	0600	-
Warning Level		29.09.99	14.56	0600	Above EDL
		-	-	-	-
E.D.L. : 14.32 m		-	-	-	-
D.L. : 13.71 m		-	-	-	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Bhagirathi	Kalna	03.09.99	7.535	0600	-
		29.09.99	8.925	0600	Above EDL
		-	-	-	-
Warning Level		-	-	-	-
		-	-	-	-
E.D.L. : 8.24 m		-	-	-	-
D.L. : 7.63 m		-	-	-	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Bhagirathi	Jangipur	05.07.99	18.62	0600	-
		14.07.99	18.59	0600	-
		21.07.99	19.28	0600	-
Warning Level		22.07.99	19.80	0600	-
		29.07.99	19.01	0600	-
E.D.L. : 20.88 m		05.08.99	18.73	0600	-
D.L. : 20.27 m		18.08.99	19.47	0600	-
		19.08.99	19.42	0600	-
		30.08.99	19.80	0600	-
		03.09.99	19.80	0600	-
		15.09.99	19.92	0600	-
		16.09.99	19.96	0600	-
		27.09.99	21.43	0600	Above EDL
		30.09.99	20.66	0600	Above DL
		07.10.99	19.00	0600	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Bhagirathi	Berhampore	05.07.99	15.54	0600	-
		14.07.99	15.35	0600	-
		21.07.99	15.72	0600	-
Warning Level		26.07.99	16.53	0600	-
		02.08.99	16.09	0600	-
E.D.L. : 17.83 m		05.08.99	15.78	0600	-
D.L. : 17.22 m		18.08.99	16.50	0600	-
		19.08.99	16.47	0600	-
		30.08.99	16.58	0600	-
		03.09.99	16.61	0600	-
		15.09.99	16.29	0600	-
		17.09.99	16.51	0600	-
		28.09.99	18.02	0600	Above EDL
		30.09.99	17.86	0600	Above EDL
		07.10.99	16.21	0600	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Sui	Pajal	07.07.99	26.35	0600	-
		14.07.99	27.05	0600	-
		20.07.99	27.38	0600	-
Warning Level		22.07.99	27.13	0600	-
		04.08.99	25.87	0600	-
E.D.L. : 28.00 m		06.08.99	25.93	0600	-
D.L. : 27.43 m		18.08.99	26.98	0600	-
		25.08.99	27.28	0600	-
		31.08.99	28.03	0600	Above EDL
		03.09.99	27.63	0600	Above DL
		10.09.99	26.33	0600	-
		16.09.99	25.61	0600	-
		27.09.99	28.11	0600	Above EDL
		01.10.99	27.93	0600	Above DL

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Sui	Katchua	06.07.99	24.15	0600	-
		14.07.99	25.30	0600	-
		19.07.99	25.56	0600	-
Warning Level		22.07.99	25.05	0600	-
		29.07.99	23.70	0600	-
E.D.L. : 26.98 m		05.08.99	23.70	0600	-
D.L. : 25.49 m		18.08.99	25.00	0600	-
		25.08.99	25.60	0600	Above DL
		01.09.99	26.62	0600	Above DL
		03.09.99	26.58	0600	Above DL
		09.09.99	25.68	0600	Above DL
		16.09.99	22.65	0600	-
		28.09.99	27.40	0600	Above EDL
		03.10.99	27.47	0600	Above EDL
		07.10.99	26.00	0600	Above DL

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Tangon	Banshihari	28.06.99	24.00	0600	-
		06.07.99	23.93	0600	-
		15.07.99	26.17	0600	Above DL
Warning Level		23.07.99	25.98	0600	Above DL
		04.08.99	24.40	0600	-
E.D.L. : 26.21 m		05.08.99	24.17	0600	-
D.L. : 25.60 m		18.08.99	25.30	0600	-
		25.08.99	25.40	0600	-
		31.08.99	26.26	0600	Above EDL
		03.09.99	26.24	0600	Above EDL
		10.09.99	24.30	0600	-
		22.09.99	25.75	0600	Above DL
		29.09.99	26.87	0600	Above EDL
		30.09.99	26.91	0600	Above EDL
		08.10.99	25.30	0600	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Nagar	Makdampur	06.07.99	29.90	0600	-
		13.07.99	30.39	0600	-
		15.07.99	31.09	0600	-
Warning Level		23.07.99	29.89	0600	-
		04.08.99	29.58	0600	-
E.D.L. : 31.86 m		06.08.99	29.62	0600	-
D.L. : 31.54 m		18.08.99	29.92	0600	-
		25.08.99	30.08	0600	-
		30.08.99	31.17	0600	-
		03.09.99	31.86	0600	-
		09.09.99	29.58	0600	-
		16.09.99	28.88	0600	-
		27.09.99	32.05	0600	Above EDL
		30.09.99	31.57	0600	Above DL
		11.10.99	29.30	0600	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Fulahar	Teljana R/S	30.06.99	26.426	0600	-
		06.07.99	27.830	0600	Above DL
		14.07.99	28.390	0600	Above EDL
Warning Level		16.07.99	27.970	0600	Above DL
		26.07.99	27.470	0600	Above DL
E.D.L. : 28.35 m		27.07.99	27.430	0600	Touched DL
D.L. : 27.43 m		05.08.99	27.430	0600	Touched DL
		13.08.99	27.250	0600	-
		20.08.99	28.250	0600	Above DL
		26.08.99	28.360	0600	Above EDL
		03.09.99	27.980	0600	Above DL
		13.09.99	27.660	0600	Above DL
		16.09.99	27.450	0600	Above DL
		28.09.99	28.910	0600	Above EDL
		30.09.99	28.220	0600	Above DL
		11.10.99	27.070	0600	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Punarbhava	Gangarampur	30.06.99	23.12	0600	-
		06.07.99	25.00	0600	-
		14.07.99	26.30	0600	Above DL
Warning Level		15.07.99	26.20	0600	Above DL
		22.07.99	25.67	0600	-
E.D.L. : 26.415 m		24.07.99	24.60	0600	-
D.L. : 25.815 m		05.08.99	24.05	0600	-
		18.08.99	24.70	0600	-
		25.08.99	25.37	0600	-
		27.08.99	26.30	0600	Above DL
		03.09.99	26.65	0600	Above EDL
		10.09.99	23.75	0600	-
		20.09.99	22.95	0600	-
		28.09.99	26.57	0600	Above EDL
		30.09.99	26.25	0600	Above DL
		08.10.99	24.65	0600	-

Annexure - III
(Sheet-13/16)

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Jamuna	Hilli	07.07.99	22.23	0600	-
		14.07.99	23.25	0600	Above DL
		21.07.99	23.37	0600	Above DL
Warning Level		22.07.99	23.55	0600	Above DL
		04.08.99	22.19	0600	-
E.D.L. : 23.76 m		05.08.99	22.05	0600	-
D.L. : 23.15 m		18.08.99	22.56	0600	-
		25.08.99	22.91	0600	-
		31.08.99	24.29	0600	Above EDL
		03.09.99	23.93	0600	Above EDL
		09.09.99	22.79	0600	-
		16.09.99	22.15	0600	-
		28.09.99	24.53	0600	Above EDL
		30.09.99	24.31	0600	Above EDL

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Atrai	Balurghat	30.06.99	19.71	0600	-
		07.07.99	20.42	0600	-
		14.07.99	23.14	0600	-
Warning Level		15.07.99	23.99	0600	Above EDL
		22.07.99	21.82	0600	-
E.D.L. : 23.76 m		29.07.99	19.12	0600	-
D.L. : 23.15 m		05.08.99	19.10	0600	-
		18.08.99	20.57	0600	
		25.08.99	22.04	0600	-
		27.08.99	23.29	0600	Above DL
		03.09.99	20.84	0600	-
		09.09.99	19.16	0600	-
		17.09.99	18.82	0600	-
		28.09.99	23.77	0600	Above EDL
		30.09.99	22.78	0600	-
		08.10.99	19.44	0600	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Dwaraka	Sankoghat	29.06.99	20.75	0600	Above DL
		05.07.99	**19.20**	**0600**	-
		14.07.99	19.50	0600	-
Warning Level		21.07.99	21.00	0600	Above DL
		23.07.99	21.35	0600	Above EDL
E.D.L. : 21.30 m		01.08.99	20.45	0600	Above DL
D.L. : 20.42 m		05.08.99	18.55	0600	-
		18.08.99	20.90	0600	-
		25.08.99	20.30	0600	-
		01.09.99	**20.90**	**0600**	Above DL
		03.09.99	20.12	0600	-
		15.09.99	**20.85**	**0600**	Above DL
		16.09.99	21.24	0600	Above DL
		27.09.99	**21.68**	**0600**	Above EDL
		01.10.99	19.95	0600	-
		07.10.99	**18.85**	**0600**	-

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Bhairab	Akheriganj	07.07.99	15.41	0600	-
		14.07.99	16.25	0600	-
		19.07.99	16.67	0600	-
Warning Level		28.07.99	16.53	0600	
		04.08.99	17.66	0600	-
E.D.L. : 19.05 m		09.08.99	17.30	0600	-
D.L. : 18.44 m		18.08.99	18.21	0600	-
		20.08.99	18.38	0600	-
		01.09.99	**18.58**	**0600**	Above DL
		03.09.99	18.62	0600	Above DL
		14.09.99	**18.66**	**0600**	Above DL
		16.09.99	18.55	0600	Above DL
		28.09.99	**19.27**	**0600**	Above EDL
		30.09.99	18.97	0600	Above DL
		07.10.99	**17.25**	**0600**	-

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Jalangi	Swarupganj	23.06.99	5.85	0600	-
		30.06.99	7.73	0600	-
		05.07.99	8.01	0600	-
Warning Level		14.07.99	7.87	0600	-
		19.07.99	8.52	0600	Above DL
E.D.L. : 9.05 m		26.07.99	9.08	0600	Above EDL
D.L. : 8.44 m		04.08.99	9.04	0600	Above DL
		05.08.99	8.98	0600	Above DL
		18.08.99	9.27	0600	Above EDL
		19.08.99	**9.36**	**0600**	**Above EDL**
		01.09.99	9.48	0600	Above EDL
		03.09.99	9.54	0600	Above EDL
		09.09.99	9.17	0600	Above EDL
		22.09.99	9.36	0600	Above EDL
		29.09.99	10.60	0600	Above EDL
		30.09.99	10.59	0600	Above EDL
		07.10.99	9.75	0600	Above EDL

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Churni	Hanskhali	30.06.99	7.73	0600	Above DL
		05.07.99	5.18	0600	-
		14.07.99	5.96	0600	-
Warning Level		21.07.00	6.49	0600	-
		27.07.99	6.78	0600	-
E.D.L. : 8.14 m		04.08.99	6.80	1200	-
D.L. : 7.53 m		06.08.99	6.86	0600	-
		18.08.99	**7.41**	**0600**	-
		24.08.99	7.50	0600	-
		01.09.99	**7.72**	**0600**	**Above DL**
		07.09.99	7.81	0600	Above DL
		09.09.99	**7.74**	**0600**	**Above DL**
		22.09.99	7.78	0600	Above DL
		29.09.99	**8.79**	**0600**	**Above EDL**
		06.10.99	9.10	0600	Above EDL
		07.10.99	9.08	0600	Above EDL

IMPORTANT GAUGE LEVEL OF RIVER DURING FLOOD SEASON OF 1999

River	Gauge at	Date	Level (in m)	Time	Remarks
1	*2*	*3*	*4*	*5*	*6*
Mundeswari	Harinkhola	28.06.99	8.33	0600	-
		13.07.99	8.37	0600	-
		27.07.99	11.78	0600	-
Warning Level		01.08.99	12.13	0600	-
		09.08.99	9.51	0600	-
E.D.L. : 12.80 m		25.09.99	14.24	1200	Above EDL
D.L. : 12.19 m		27.09.99	13.56	0600	Above EDL
		28.09.99	13.11	0600	Above EDL

IMPORTANT BARRAGE LEVEL & DISCHARGE DATA DURING THE FLOOD SEASON OF 1999

Name of Barrage : Tilpara

Date	Time	Barrage Level (in m)	Discharge in Cumecs	Remarks
1	*2*	*3*	*4*	*5*
19.06.99	6.00	62.453	-	-
23.06.99	6.00	62.423	57.60	-
02.07.99	6.00	59.131	-	-
10.07.99	6.00	59.223	-	-
15.07.99	6.00	59.772	-	-
20.07.99	6.00	60.137	-	-
30.07.99	6.00	59.985	-	-
06.08.99	6.00	62.636	-	-
16.08.99	6.00	61.661	875.65	-
23.08.99	6.00	62.362	472.80	-
27.08.99	6.00	61.722	526.07	-
31.08.99	6.00	61.996	765.55	-
01.09.99	6.00	61.935	637.35	-
13.09.99	6.00	62.606	30.08	-
16.09.99	6.00	62.027	768.94	-
25.09.99	6.00	63.033	4561.13	Discharge down Tilpara Barrage on 24.9.99 at 1730 hours 1,12,642 cusecs
26.09.99	6.00	62.118	3472.91	
27.09.99	6.00	59.284	398.12	
29.09.99	6.00	59.131	288.50	
04.10.99	6.00	61.935	166.34	
60.10.99	6.00	61.570	103.32	-
07.10.99	6.00	62.088	511.48	-
16.10.99	6.00	62.575	130.27	-
20.10.99	6.00	60.990	1999.39	-
21.10.99	6.00	50.070	274.99	-

IMPORTANT BARRAGE LEVEL & DISCHARGE DATA DURING THE FLOOD SEASON OF 1999

Name of Barrage : Durgapur

Date	Time	Barrage Level (in m)	Discharge in Cumecs	Remarks
1	*2*	*3*	*4*	*5*
15.06.99	6.00	64.404	121.78	-
28. 06.99	6.00	64.313	547.99	-
30.06.99	6.00	64.313	489.94	-
08.07.99	6.00	64.313	487.10	-
15.07.99	6.00	64.160	1721.86	-
16.07.99	6.00	64.190	1674.42	-
21.07.99	6.00	64.160	1071.15	-
24.07.99	6.00	64.160	1824.46	-
26.07.99	6.00	64.160	1969.91	-
27.07.99	6.00	64.160	1838.05	-
30.07.99	6.00	64.160	1881.18	-
01.08.99	6.00	64.160	2023.95	-
03.08.99	6.00	64.160	1242.00	-
09.08.99	6.00	64.160	1449.87	-
10.08.99	6.00	64.140	1556.81	-
14.08.99	6.00	64.160	1252.61	-
18.08.99	6.00	64.160	944.64	-
27.08.99	6.00	64.160	1660.26	-
28.08.99	6.00	64.160	2038.42	-
02.09.99	6.00	64.160	1749.16	-
07.09.99	6.00	64.160	1032.38	-
17.09.99	6.00	64.313	774.55	Maximum dis-
25.09.99	6.00	64.008	6122.78	charge recorded
26.09.99	6.00	63.886	4378.16	down Durgapur
27.09.99	6.00	64.008	3423.89	Barrage at 00.00
28.09.99	6.00	64.008	2132.50	hours 2,18,650
29.09.99	6.00	64.008	1709.82	cusecs.
05.10.99	6.00	64.465	509.76	-
11.10.99	6.00	64.465	601.09	-
12.10.99	6.00	64.465	431.88	-
20.10.99	6.00	64.008	3100.33	-
21.10.99	6.00	64.008	2507.04	-
22.10.99	6.00	64.008	2374.63	-

Annexure-V
(Sheet-1/11)

PROFORMA STATEMENT SHOWING DISTRICTWISE DETAILS OF DIFFERENT TYPES OF DAMAGES & THE COST INVOLVED THEREIN FOR RESTORATION WORKS DUE TO RECENT FLOOD DURING 1999

Nature of Extent of Damages							Inundated Area	Date of *Occurrence*	Cost of Restoration		Total Amount Required	Remarks
Number of Breaches (in No.)	Washed Out (in km)	Severely Damaged (in km)	Partially Damaged (in km)	Damaged to dry Block pitching, Revetment slope, Protection work (in km)	Slips, Bank Erosion (in km)	Damages to Sluice/Structures, Protective works (in No.)	(in sq.km)		Initial Cost for Restoration (in Lakhs)	Final Cost for Restoration (in Lakhs)	(in Lakhs)	
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
Name of District : SOUTH 24-PARGANAS												
Name of Division	Kakdwip Irrigation Division											
Name of Rivers	Hooghly, Baratola, Muriganga, Banstola, Ghughudanga, Kalnagini, Chunpuri, Chonargan, Hatania-Doania, Bay of Bengal, Hooghly, Jagaddal, Saptamukhi, Chaltaberia, Curzon Creek											
Name of P.S.	Kakdwip, Namkhana, Patharpratima, Sagar											
11	1.962	35.40	12.66	6.06	--	19	21.25	Jun. 10 & 11 Sep. 23 to 30	125.35	50.00	175.35	
Name of Division	Jaynagar Irrigation Division											
Name of Rivers	Mridangabhanga, Thakuran, Gobadia, Matla, Hogal, Bidya, Raimongal, Raidighi											
Name of P.S.	Raidighi, Mathurapur-II, Gosaba, Basanti, Canning-I, Kultoli, Patharpratima											
84	10.725	83.38	22.55	11.48	--	5	98.00	Jun. 10 & 11 Sep. 23 to 30	230.54	35.00	265.54	
Name of Division	Canals Division											
Name of Rivers	Hooghly, Matla											
Name of P.S.	Kulpi, Diamond Harbour-I & II, Budge Budge-I & II, Canning, Bhangar											
1	0.200	4.16	3.10	2.56	--	5	5.00	Jun. 10 & 11 Sep. 23 to 30	21.86	15.00	36.86	
								Total	**377.75**	**100.00**	**477.75**	

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of District : **NORTH 24-PARGANAS**												
Name of Division Name of Rivers Name of P.S.		Basirhat Irrigation Division Ichamati. Bidyadhari, Chhoto Kalagachi, Kalindi, Raymongal, Bara Kalagachi, Dansa, Sahebkhali Baduria, **Swarupnagar**, Basirhat-I, Basirhat-II, Hasnabad, Sandeshkhali-I & II, Minakhan, Hingalganj										
--	--	12.21	24.43	4.00	--	11	--	Jun 10 & 11, Sep 23 to 30	20.00	50.00	70.00	
Name of Division Name of Rivers Name of P.S.		Canals Division Hooghly, Haroagong, Kultigong Dum Dum, South Dum Dum, North Dum Dum, Rajarhat, Gopalpur, Haroa, Garulia										
--	--	1.00	1.50	0.50	--	4	6.00	Jun 10 & 11, Sep 23 to 30	5.25	50.00	55.25	Drainage Congestion
								Total	**25.25**	**100.00**	**125.25**	
Name of District : **SOUTH 24-PARGANAS**												
Name of Division Name of Rivers Name of P.S.		Metropolitan Drainage Division No.I Begore Khal Behala, Maheshtala										
--	--	4.00	2.40	--	--	--	6.03	Sep.23 to Oct. 04	--	5.00	5.00	Av. Depth of submergence was 0.90 m.
Name of Division Name of Rivers Name of P.S.		Metropolitan Drainage Division No.II T. P. Basin Jadavpur, Kasba, Tiljala										
--	--	--	--	--	--	--	20.00	Sep. 24 to Oct. 01	--	--	--	
								C.O.	--	**5.00**	**5.00**	

Annexure-V
(Sheet-3/11)

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of Division Name of Rivers Name of P.S.		Urban Drainage Division T. P. Main Khal Closure Tiljala						**B .F.**	--	**5.00**	**5.00**	
--	--	--	0.03	--	--	--	28.00	Aug 25, Sep. 24 to Oct 18	--	1.08	1.08	
Name of Division Name of Rivers Name of P.S.		Suburban Drainage Division Manikhali, Churial, Alampur, Balarampur, Kantakhali Maheshtala, Thakurpukur, Metiabruz, Budge Budge, Falta, Bishnupur, Nodakhali										
--	--	--	0.15	--	2.635	3	51.25	Sep. 24 & 25	--	109.60	109.60	
Name of District :		**NORTH 24-PARGANAS**						**Total**	--	**115.68**	**115.68**	
Name of Division Name of Rivers Name of P.S.		Metropolitan Drainage Division No.I Lower Bagjola Khal Rajarhat, Bhangore, Haroa										
--	0.10	0.50	1.30	--	18.00	20	82.00	Sep 23 to Oct 02	--	8.00	8.00	Av. Depth of submergence was 0.75 m.
Name of Division Name of Rivers Name of P.S.		Metropolitan Drainage Division No.II Upper Bagjola Khal Kamarhati, Baranagar, **Dum Dum, Lake Town**										
--	--	--	--	--	--	--	11.02	Sep 24 to Oct 01	--	0.05	0.05	Av. Depth of submergence was 0.30 m.
Name of Division Name of Rivers Name of P.S.		Urban Drainage Division Nowi Khal, Khardah Khal, Fatesah Khal, C.C. Branch Khal Rajarhat, Barasat, Khardah, Airport										
--	--	--	--	--	--	--	23.40	Aug. 15 and Sep 24 to Oct. 18	--	4.20	4.20	**Av. Depth of submergence at different khals was 0.90 m.**
								C.O.	--	**12.25**	**12.25**	

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of Division Name of Rivers **Name of P.S.**		Bidyadhari Drainage Division Ichamati, Jamuna, Sealdagong --						**B.F.**	--	**12.25**	**12.25**	
3	--	--	--	--	--	3	20.00	Sep. 22 to 27	--	10.00	10.00	
Name of Division Name of Rivers Name of P.S.		Suburban Drainage Division Bager Khal, Ichapur Bizpur, Noapara										
--	--	--	0.12	--	0.21	3	1.00	September 24 & 25	--	17.40	17.40	
								Total	--	**39.65**	**39.65**	
Name of District : **HOWRAH**												
Name of Division Name of Rivers Name of P.S.		Howrah Irrigation Division Damodar, Lower Rampur Khal, Upper Rampur Khal, Hurhura Khal, Kana Damodar, Rajapur & its Branches, Metia, Kamarsala, Hooghly, Rupnarayan Udaynarayanpur, Amta-I&II, Bauria, Khanakul, J.I.Pur, Panchla, Domjur, Uluberia, Bagnan, Shyampur, Sankrail										
61	1.50	6.20	4.66	0.36	2.286	--	82.00	September 24 to 26	23.75	470.00	493.75	
Name of Division Name of Rivers Name of P.S.		Lower Damodar Construction Division Amta Channel (Lower Damodar) Bagnan, Uluberia										
--	--	--	--	--	0.500	--	--	September 20 to 30	--	30.00	30.00	
								Total	**23.75**	**500.00**	**523.75**	

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of District : HOOGLY												
Name of Division		Hooghly Irrigation Division										
Name of Rivers		Darakeswar, Sankari, Mundeswari, Damodar, Dakatia Khal, Madaria Khal, Rajapur, Baidyabati, Dankuni Cut Kunti Channel, Ghea River, Kana River, River Lower, Kedarmoti, Hooghly, Iksas										
Name of P.S.		Khanakul, Arambagh, Goghat, Pursurah, Jangipara, Haripal, Chanditala, Srirampur, Dankuni, Singur, Polba, Bhadreswar, Balagarh, Mogra, Chinsurah, Dadpur										
1	1.75	8.20	17.45	2.14	1.55	21 Waterlogging :	600.00 1193.00	Sep 24 to 26, Sep 28	26.23	224.70	250.93	
Name of District : MIDNAPORE												
Name of Division		Hooghly Irrigation Division										
Name of Rivers		Sankari										
Name of P.S.		Ghatal										
--	--	1.00	1.50	0.40	--	--	--	Sep 25	1.03	15.00	16.03	
Name of District : BURDWAN												
Name of Division		Hooghly Irrigation Division										
Name of Rivers		Damodar										
Name of P.S.		Jamalpur, Memari										
--	--	0.40	--	--	0.50	2	--	Sep 26 & 27	6.95	17.00	23.95	
								Total	**34.21**	**256.70**	**290.91**	
								I & W Deptt. Demand	**24.15**	**200.00**	**224.15**	

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of District : MIDNAPORE												
Name of Division Name of Rivers Name of P.S.	Contai Irrigation Division Kaliaghai, Baliaghai Main Drain, Haldi, Hooghly, Pichaboni Khal, Orissa Coast Canal Potashpur, Bhagwanpur, Nandigram, Egra, Ramnagar											
--	0.125	0.15	0.26	1.50 Ghoges :	1.22 140 Nos.	24 Nos. / 1 No.	8.50 km Overtopping	August 08	29.07	85.000	114.070	
Name of Division Name of Rivers Name of P.S.	East Midnapore Division New Cossye, Kherai, Buxi, Durbachatty, Old Cossye, Silaboti, Rupnarayan, Gangakhali Khal, Kaliaghai, Sankarara Khal, Nunan Khal, Mathuri Khal, **Gopalpur Khal, Pairatungi Khal** Panskura, Moyna, Tamluk, Pingla, Kolaghat, Daspur, Ghatal, Sabang											
23	--	9.20	46.13	2.53 Ghoges :	4.43 509 Nos.	56 0.050 km	62.00 **6.67 km** Overtopping	**August 07**, Sep 25 to 27 & October 04	68.04	294.480	362.520	
Name of Division Name of Rivers Name of P.S.	West Midnapore Division Kaliaghai, Kapaleswari, Kalaichandi Khal, Cossye, Old Cossye, New Cossye Narayangarh, Sabang, Midnaore Sadar, Kharagpur, Debra											
41	0.500	3.645	54.50	2.50 Ghoges :	5.05 293 Nos.	7 Nos. / 5 Nos.	237.00 14.50 km Overtopping	August 7 to 9, **19, Sep. 25 to** Sep. 27	87.16	466.835	553.995	
								Total	**184.27**	**846.315**	**1030.585**	

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of District :		**BURDWAN**										
Name of Division		Damodar Head Works Division										
Name of Rivers		Ajay, Kunur										
Name of P.S.		Kanksa, Ausgram, Mangalkote, Bhatar										
1	0.50	10.80	15.70	1.50	6.70	1	4.86	Sept. 15 & October 19	19.02	159.75	178.77	
Name of Division		Damodar Canals Division										
Name of Rivers		Bhagirathi, Damodar, Ajay, Banka										
Name of P.S.		Ketugram, Katwa, Galsi, Burdwan, Memari, Mangalkote										
--	--	3.00	9.00	20.78	4.90	--	--	Sep. 24 to 30	16.92	51.85	68.77	
Name of Division		Lower Damodar Irrigation Division										
Name of Rivers		Damodar										
Name of P.S.		Jamalpur										
--	--	--	--	2.00	--	--	--	Sep. 24 to 30	6.23	78.40	86.63	
Name of Division		Burdwan Irrigation Division										
Name of Rivers		Bhagirathi										
Name of P.S.		Purbasthali, Kalna										
--	--	--	1.00	2.00	--	--	23.00	Sep. 24 to 30	6.18	--	6.18	
Name of District :		**BANKURA**						**Total**	**50.35**	**290.00**	**340.35**	
Name of Division		Damodar Head Works Division										
Name of Rivers		Damodar										
Name of P.S.		Barjora										
--	--	1.00	1.00	--	0.50	--	8.10	Sept. 25	--	10.00	10.00	
								Total	**--**	**10.00**	**10.00**	

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of District : PURULIA												
Name of Division Name of Rivers Name of P.S.		Purulia Irrigation Division Different Schemes --										
264 (1026 m)	--	--	25.10	--	294	25	--	Sep 23 to 25	--	129.71	129.71	
Name of Division Name of Rivers Name of P.S.		Purulia Investigation & Planning Division Different Schemes Kashipur, Arsha, Raghunathpur, Para, Bandown										
34 (251 m)	--	0.015	5.63	--	61	4	--	Sep 23 & 24	--	26.68	26.68	
Name of Division Name of Rivers Name of P.S.		Purulia Construction Division Different Schemes Arsha, Kashipur, Santuri & Saltora, Bara Bazar, Balarampur										
46 (279 m)	--	--	4.07	--	95	3	--	--	--	18.61	18.61	
								Total	--	**175.00**	**175.00**	
Name of District : NADIA												
Name of Division Name of Rivers Name of P.S.		Nadia Irrigation Division Bhagirathi, Jalangi, Churni, Herer Khal Kaliganj, Nabadwip, Santipur, Ranaghat-I, Chakdaha, Tehatta, Karimpur, Krishnanagar, Chapra, Hanskhali										
22	1.48	2.30	52.30	4.98	2.70	2	2000.00	Sep 24 to 27	20.00	410.00	430.00	
								Total	**20.00**	**410.00**	**430.00**	

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of District : **MURSHIDABAD**												
Name of Division	Berhampore Irrigation Division											
Name of Rivers	Babla, Mayurakshi, Belekuya, Kana Mayurakshi, Dwarka, Bele Brahmani											
Name of P.S.	Rejinagar, Burwan, Bharatpur, Kandi, Khargram, Nabagram, Berhampore, Beldanga, Jiaganj, Suti, Raghunathganj, Sagardighi, Lalgola, Lalbagh, Bhagabangola, Raninagar, Daulatabad, Islampur, Domkal, Hariharpara, Nawda											
190 (17.17 km)	--	7.10	7.20	--	38.92	20	1850.00	Sep 25 to 27	38.40	1299.20	1337.60	
Name of Division	Ganga Anti Erosion Division No.I											
Name of Rivers	Ganga											
Name of P.S.	--											
--	--	--	--	--	5.20	--	--	Jul to Oct.	111.70	660.00	771.70	
Name of Division	Ganga Anti Erosion Division No.II											
Name of Rivers	Ganga											
Name of P.S.	Jalangi											
--	--	--	--	--	2.00	--	--	Jul to Oct.	118.50	100.00	218.50	
								Total	**268.60**	**2059.20**	**2327.80**	
Name of District : **DAKSHIN DINAJPUR**												
Name of Division	South Dinajpur Irrigation Division											
Name of Rivers	Tangon, Punarbhaba, Atrai, Jamuna											
Name of P.S.	Kushmundi, Banshihari, Gangarampur, Balurghat, Kumarganj, Hilly,											
--	0.50	2.28	24.84	1.92	1.63	**	817.94	Jul. to Sep.	49.75	80.00	129.75	
			** 4 (Four) Nos. Sluice with Protective Work. 3 (Three) Nos. Wooden Bridge with approach.					**Total**	**49.75**	**80.00**	**129.75**	

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of District : UTTAR DINAJPUR												
Name of Division Name of Rivers Name of P.S.		North Dinajpur Irrigation Division Nagar, Mahananda, Sui, Bina, Gamari, Chiramati, Dhapasi, Kullick, Tangon, Dauk, Doluncha Itahar, Raiganj, Kaliyaganj, Hemtabad, Chopra, Islampur										
19 (0.32 km)	0.37	24.78	30.93	0.26	12.14	19 Nos. Sluice, 2 Nos. Wooden Bridge and 1 No. Structure	458.00	Sep 26 to 29	50.50	250.00	300.50	
								Total	**50.50**	**250.00**	**300.50**	
Name of District : MALDA												
Name of Division Name of Rivers Name of P.S.		Mahananda Embankment Division Fulahar, Mahananda, Kalindri Harishchandrapur, Ratua, Kharba, Gazol										
4	--	38.50	31.00	0.80	At Ramayanpur & Belsingri	14 Nos. Sluice, 4 Nos. Spur	340.00	June. 28, Jul . 9, Sep. 24 to Oct. 06	80.00	347.00	427.00	
Name of Division Name of Rivers Name of P.S.		Malda Irrigation Division Srimati, Mahananda, Kalindri, Ganga Gazol, Englishbazar, Malda, Ratua, Manickchak, Kaliachak										
17	3.45	9.66	17.60	2.50	**	13 Nos. Sluice & 2 Nos. Spur (Spur Nos. 19 & 20)	76.50	Sep. 24, Sep. 27 to Oct. 02	20.50	253.00	273.50	
								Total	**100.50**	**600.00**	**700.50**	

** 0.33 km slips occurred in river side and country side slope in mouza Manickchak, Englishbazar, Kaliachak along river Ganga.

1	2	3	4	5	6	7	8	9	10	11	12	13
Name of District : **BIRBHUM**												
Name of Division Name of Rivers Name of P.S.		Mayurakshi Head Quarter Division Mayurakshi, Kuskarini, & Different Canals Rajnagar, Md. Bazar, Mayureswar, Bolpur, Kandi, Bharatpur, Ketugram, Sainthia, Murarai										
16 (4.692 km)	--	65.91 [1 No. 0.305 km Canal Bank]	Messan-jore Dam. Tilpara Barrage	4.023	5.122 (13 Places)	7 Nos.	1005.00	Sep to Oct	--	816.76	816.76	
Name of Division Name of Rivers Name of P.S.		Mayurakshi South Canals Division Ajay, Kuiya-Babla Bolpur, Dubrajpur, Nanoor, Ketugram, Bharatpur, Kandi, Khoirasole, Illambazar										
48 (2.922 km)	--	5 Nos. 4.292 km [174 Nos. 5.090 km Canal Bank]	Kadisala Weir	0.035	17.803 (27 Places)	9 Nos.	740.00	Sep to Oct	--	411.08	411.08	
Name of Division Name of Rivers Name of P.S.		Mayurakshi North Canals Division Mayurakshi, Bansloi, Brahamani Md. Bazar, Mayureswar, Rampurhat, Murarai, Nalhati, Barwan										
9 (0.345)	--	4 Nos. 7.976 km [7 Places Canal Bank]	--	--	8.598 [22 Places]	--	747.00	Sep to Oct	--	208.01	208.01	
								Total	--	**1435.85**	**1435.85**	

Annexure-VI
(Sheet-1/1)

REQUIREMENT OF FUND FOR FLOOD FIGHTING & RESTORATION WORKS FOR THE FLOOD OF 1999

Sl. No.	Name of District	Requirement of Fund (Rs. In Lakhs)			
		Works already completed (Flood Fighting Works)	Works proposed to be completed by June, 2000	Total	Remarks
1	*2*	*3*	*4*	*5*	*6*
1.	Coochbehar	35.00	250.00	285.00	
2.	Jalpaiguri	90.00	650.00	740.00	
3.	Darjeeling (Siliguri Mahakuma Parishad)	30.00	170.00	200.00	
4.	Uttar Dinajpur	50.50	250.00	300.50	
5.	Dakshin Dinajpur	49.75	80.00	129.75	
6.	Maldah	100.50	600.00	700.50	
7.	Murshidabad	137.80	2190.00	2327.80	
8.	Nadia	20.00	410.00	430.00	
9.	Midnapore	167.25	650.00	817.25	
10.	Birbhum	75.00	1075.00	1150.00	
11.	Burdwan	50.35	300.00	350.35	
12.	Howrah	23.75	500.00	523.75	
13.	Hooghly	24.15	200.00	224.15	
14.	North 24-Parganas	25.25	100.00	125.25	
15.	South 24-Parganas	377.75	100.00	477.75	
16.	Calcutta (Corporation Area)	--	--	--	
17.	Purulia	25.00	150.00	175.00	
18.	Bankura	--	10.00	10.00	
	Total	**1282.05**	**7685.00**	**8967.05**	

Annexure-VII
(Sheet-1/1)

TABLE OF DISTRICTWISE AREA INUNDATED IN THE YEAR 1999 DUE TO FLOOD AGAINST THE ACTUAL TERRITORIAL AREAS

Sl. No.	Name of District	Territorial Areas (in sq.km.)	Average Inundated Areas (in sq.km.)	Remarks
1	*2*	*3*	*4*	*5*
1.	South 24-Parganas	14136	229.53	
2.	North 24-Parganas		143.42	
3.	Midnapore	14081	329.00	
4.	Hooghly	3149	600.00	
5.	Howrah	1467	82.00	
6.	Calcutta (Corporation Area)	104	---	
7.	Murshidabad	5324	1850.00	
8.	Nadia	3927	2000.00	
9.	Birbhum	4545	2492.00	
10.	Burdwan	7024	27.86	
11.	Maldah	3733	416.50	
12.	Jalpaiguri	6227	538.51	
13.	North Dinajpur	5858	458.00	
14.	South Dinajpur		817.94	
15.	Darjeeling	3149	---	
16.	Coochbehar	3387	239.60	
17.	Bankura	6882	8.10	
18.	Purulia	6259	---	

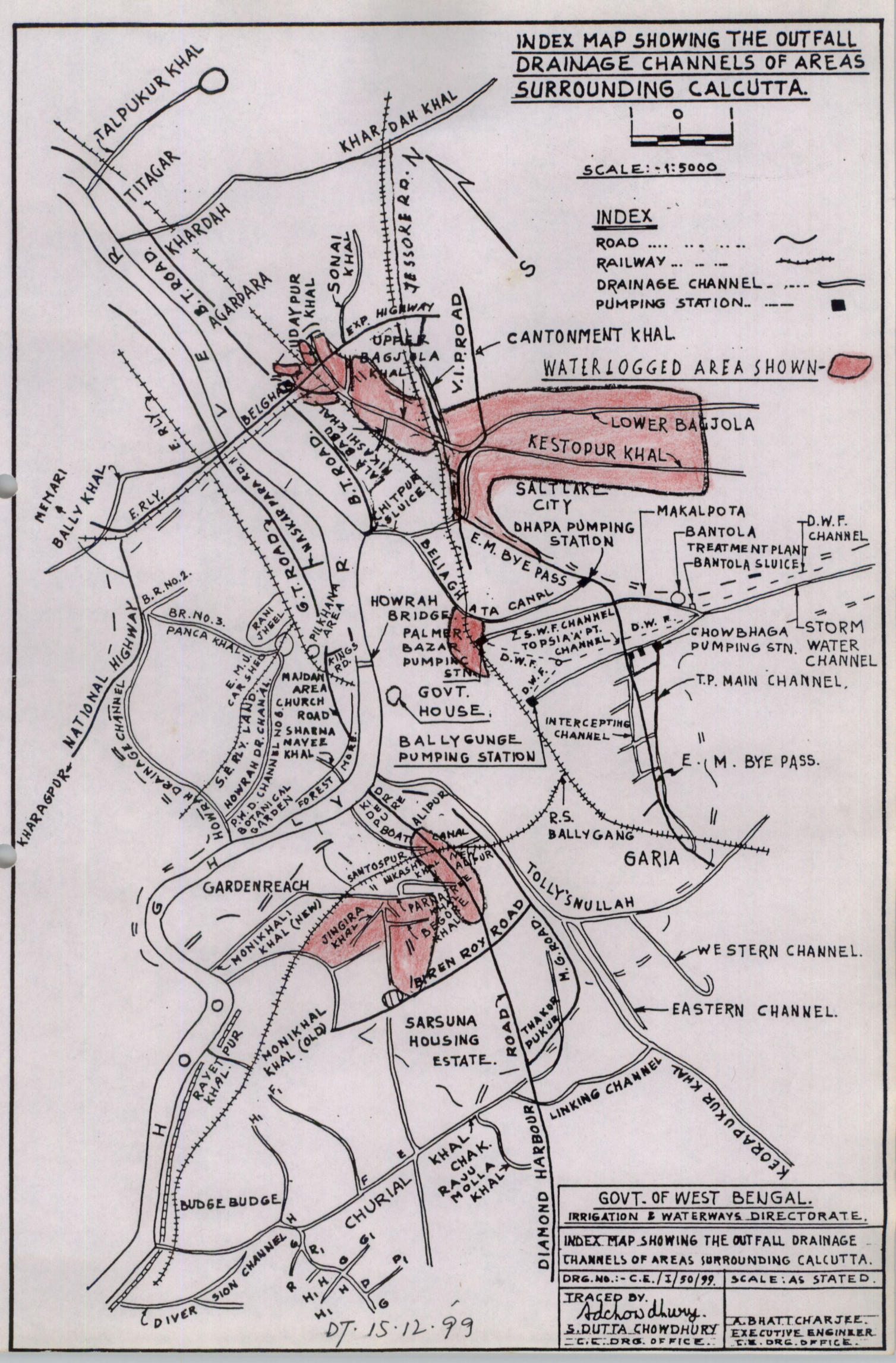
DAM/BARRAGE RELEASE DATA FOR THE PERIOD FROM 24.9.99 TO 28.9.99, 19.10.99 AND 20.10.99

[Figures in Cusecs]

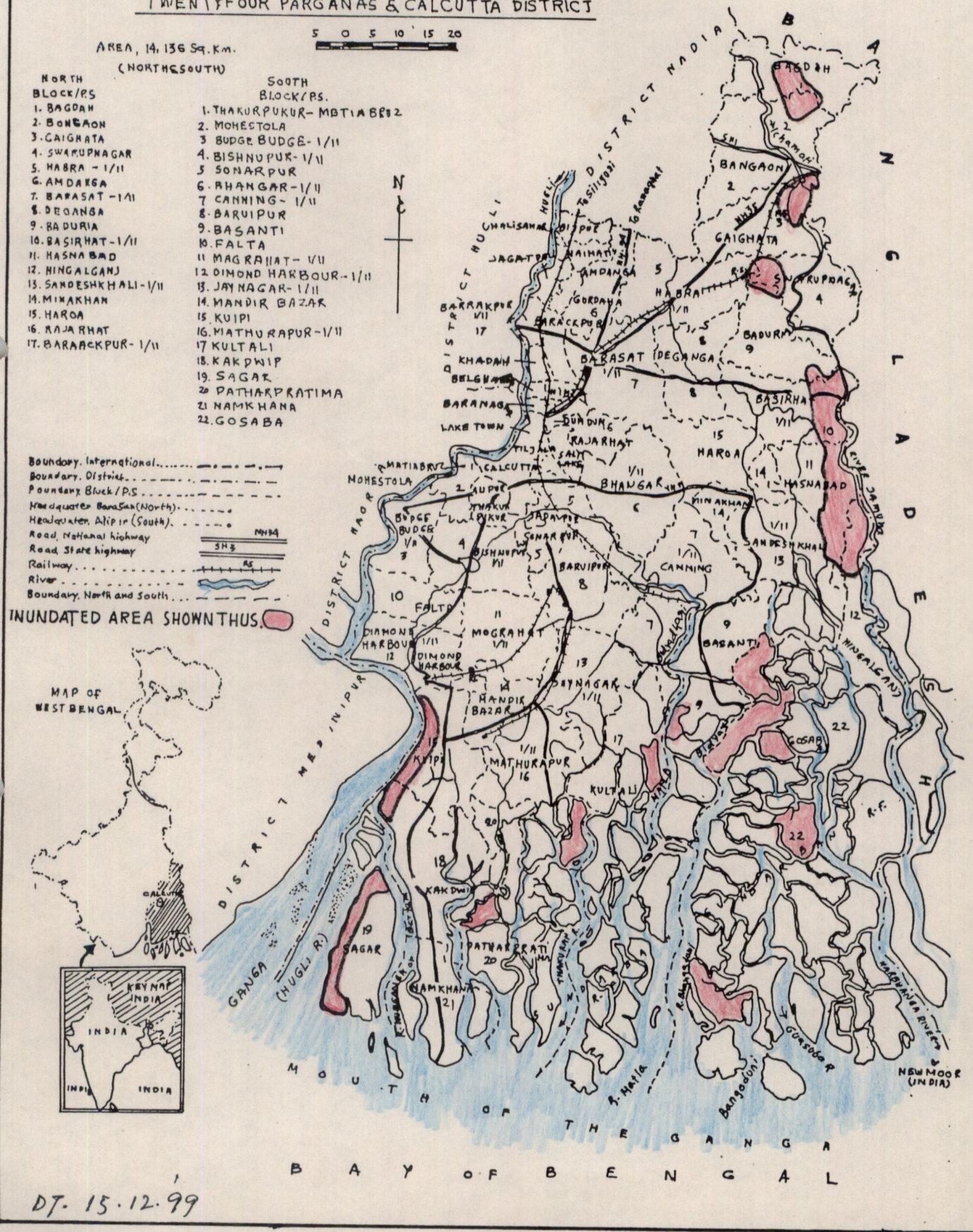
Station	24.9.99	25.9.99	26.9.99	27.9.99	28.9.99	19.10.99	20.10.99
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
D V B I							
Maithon	40,000	50,000	70,000	40,000	17,000	20,000	20,000
Panchet	80,000	40,000	50,000	60,000	50,000	50,000	50,000
Durgapur	1,86,450 (20.00 hr)	2,18,650 (0.00 hr)	1,54,596 (6.00 hr)	1,20,900	75,300	76,100	1,09,475 (3.00 hr)
MAYURAKSHI BASIN							
Messanjore 398.00 ft (Conservation Level)	1,30,259 (403.00 ft)	2,08,000① (403.10 ft)	7,184	5,570	5,570	76,860 (396.95 ft) (20.00 hr)	69,440 (396.05 ft) (01.00 hr)
Tilpara Barrage	1,54,661	2,10,680	75,755	15,925	16,560	85,054 (23.00 hr)	83,699 (01.00 hr)
Hinglow	57,600 (323.00 ft)	9,792	3,144	3,169	3,172	7,742	---
KANGSABATI BASIN							
Kangsabati	90,000② (from 15.00 hrs)	76,000	59,900 26,000 (from14.00 hrs)	16,000	16,000 (Dam was closed at 16.00 hrs)	41,000 (at 10.30 hrs)	20,000

① Maximum observed inflow into Massanjore Reservoir 2,27,750 cusecs on 25.9.99.

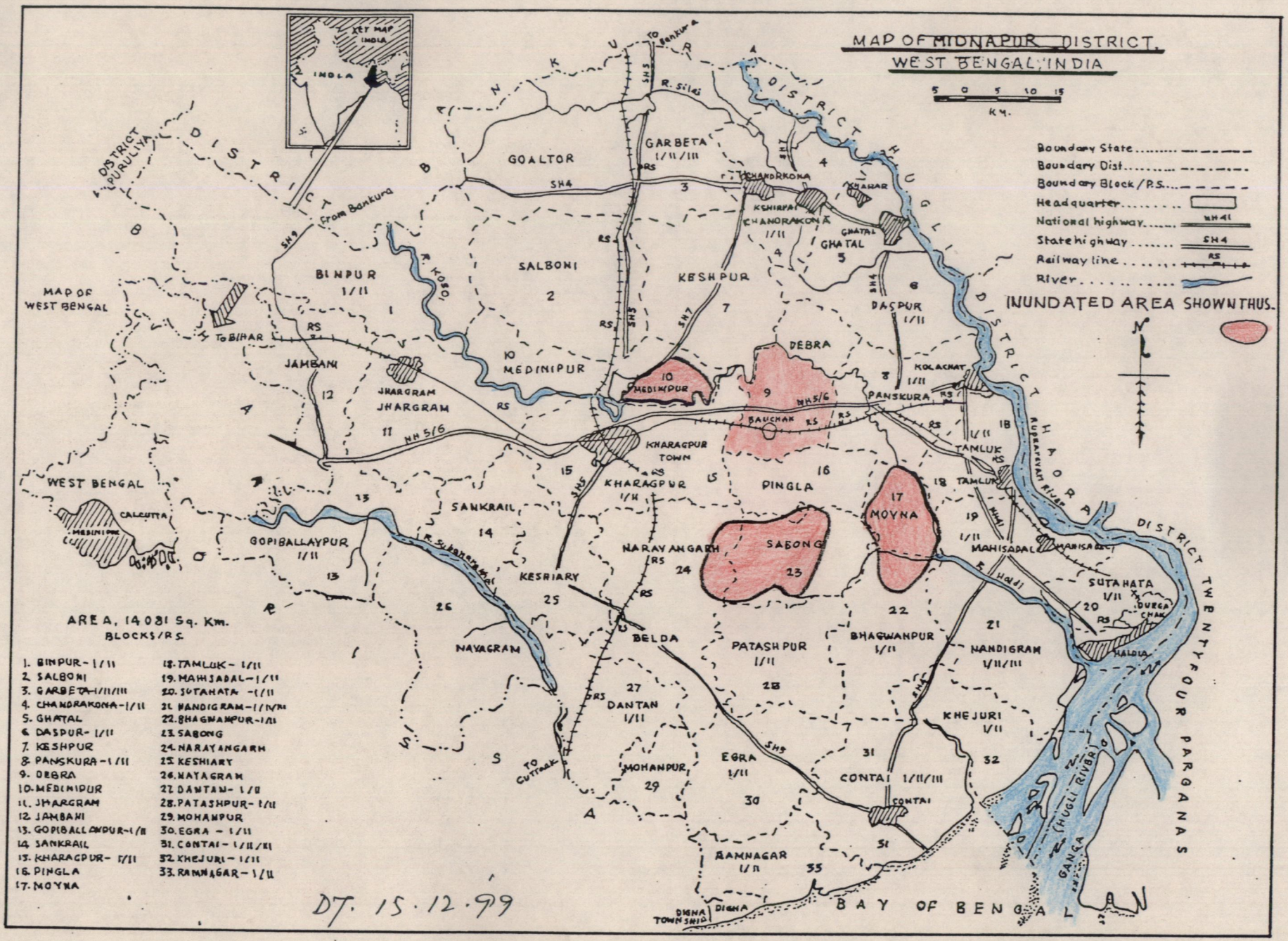
② Maximum observed inflow into Kangsabati Reservoir 2,57,000 cusecs on 24.9.99.

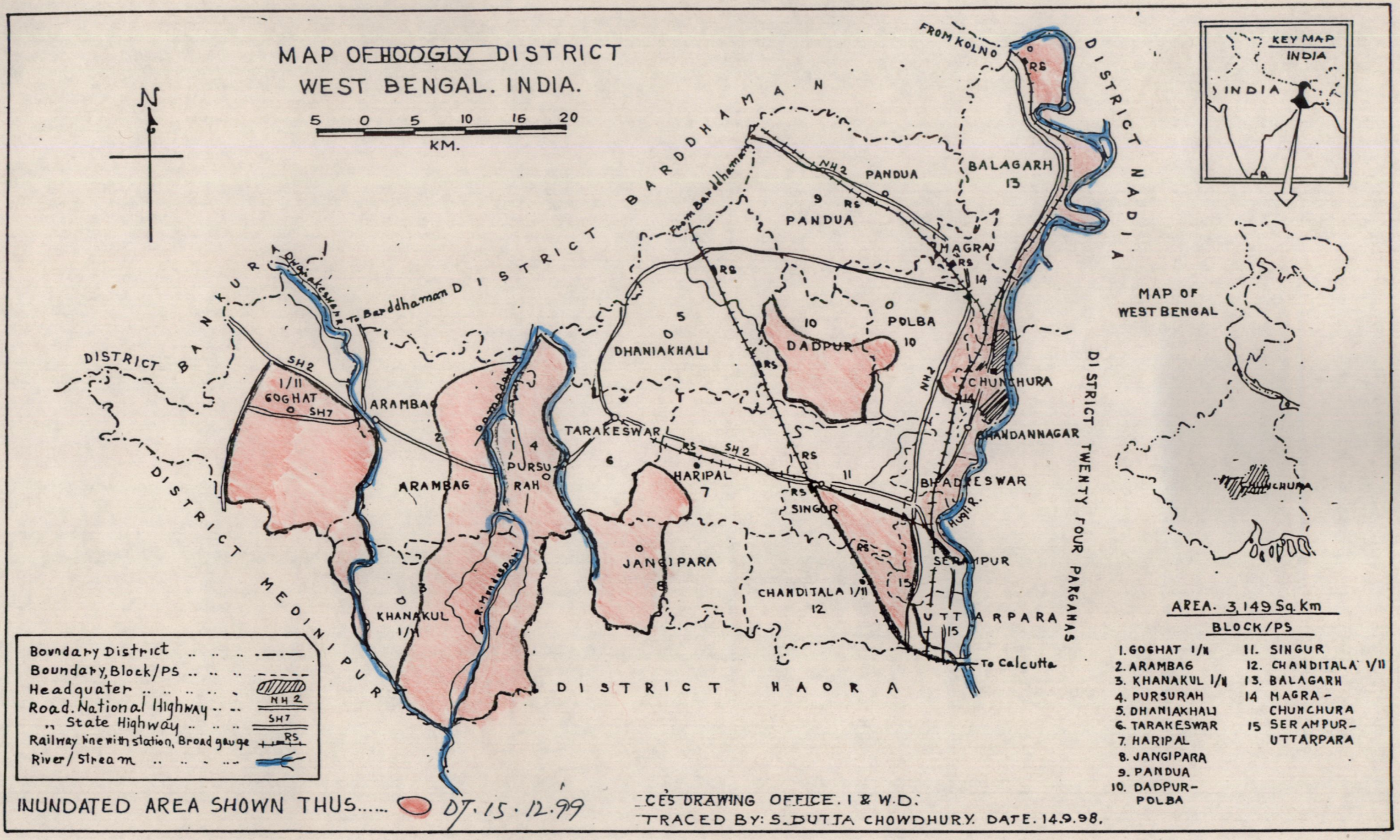

INDEX MAP SHOWING THE OUTFALL DRAINAGE CHANNELS OF AREAS SURROUNDING CALCUTTA.
SCALE:-1:5000
INDEX
ROAD
RAILWAY
DRAINAGE CHANNEL
PUMPING STATION
WATERLOGGED AREA SHOWN
TALPUKUR KHAL
TITAGAR
KHARDAH
KHARDAH KHAL
B.T. ROAD
AGARPARA
SONAI KHAL
JESSORE RD.
N
S
UDAYPUR KHAL
EXP. HIGHWAY
UPPER BAGJOLA KHAL
V.I.P. ROAD
CANTONMENT KHAL
LOWER BAGJOLA
KESTOPUR KHAL
SALTLAKE CITY
DHAPA PUMPING STATION
MAKALPOTA
BANTOLA
TREATMENT PLANT
BANTOLA SLUICE
D.W.F. CHANNEL
STORM WATER CHANNEL
E.M. BYE PASS
BELIAGHATA CANAL
HOWRAH BRIDGE
PALMER BAZAR PUMPING STN.
S.W.F. CHANNEL
TOPSIA 'A' PT. CHANNEL
D.W.F.
CHOWBHAGA PUMPING STN.
T.P. MAIN CHANNEL
INTERCEPTING CHANNEL
E. M. BYE PASS.
GOVT. HOUSE.
BALLYGUNGE PUMPING STATION
R.S. BALLYGANG
GARIA
TOLLY'S NULLAH
WESTERN CHANNEL.
EASTERN CHANNEL.
KEORAPUKUR KHAL
LINKING CHANNEL
DIAMOND HARBOUR ROAD
M.G. ROAD
THAKUR PUKUR
SARSUNA HOUSING ESTATE.
BIREN ROY ROAD
GARDENREACH
MONIKHALI KHAL (NEW)
JINGIRA KHAL
MONIKHAL KHAL (OLD)
RAYETPUR KHAL
BUDGE BUDGE
CHURIAL
KHAL CHAK.
RAJU MOLLA KHAL
DIVERSION CHANNEL
HOOGHLY
KHARAGPUR NATIONAL HIGHWAY
HOWRAH DRAINAGE CHANNEL
MEMARI & BALLY KHAL
E.RLY.
BELGHAR
NASKARPARA RD.
G.T. ROAD
PILKHANA AREA
KINGS RD.
MAIDAN AREA
CHURCH ROAD
SHARNA MAYEE KHAL
HOWRAH DR. CHANNEL NO. 6
P.W.D. BOTANICAL GARDEN
FOREST MORE
B.R. NO. 2.
BR. NO. 3.
PANCA KHAL
RANI JHEEL
E.M.U. CAR SHED
S.E. RLY. LAND
KIDDERPURE BOAT CANAL
ALIPUR
SANTOSPUR
NIKASHI KHAL
NEW ALIPUR
PARNASREE KHAL
BEGORE KHAL
DT. 15.12.99
GOVT. OF WEST BENGAL.
IRRIGATION & WATERWAYS DIRECTORATE.
INDEX MAP SHOWING THE OUTFALL DRAINAGE CHANNELS OF AREAS SURROUNDING CALCUTTA.
DRG. NO.:- C.E./I/50/99.
SCALE: AS STATED.
TRACED BY.
Adchowdhury.
S. DUTTA CHOWDHURY
C.E. DRG. OFFICE.
A. BHATTACHARJEE.
EXECUTIVE ENGINEER
C.E. DRG. OFFICE.

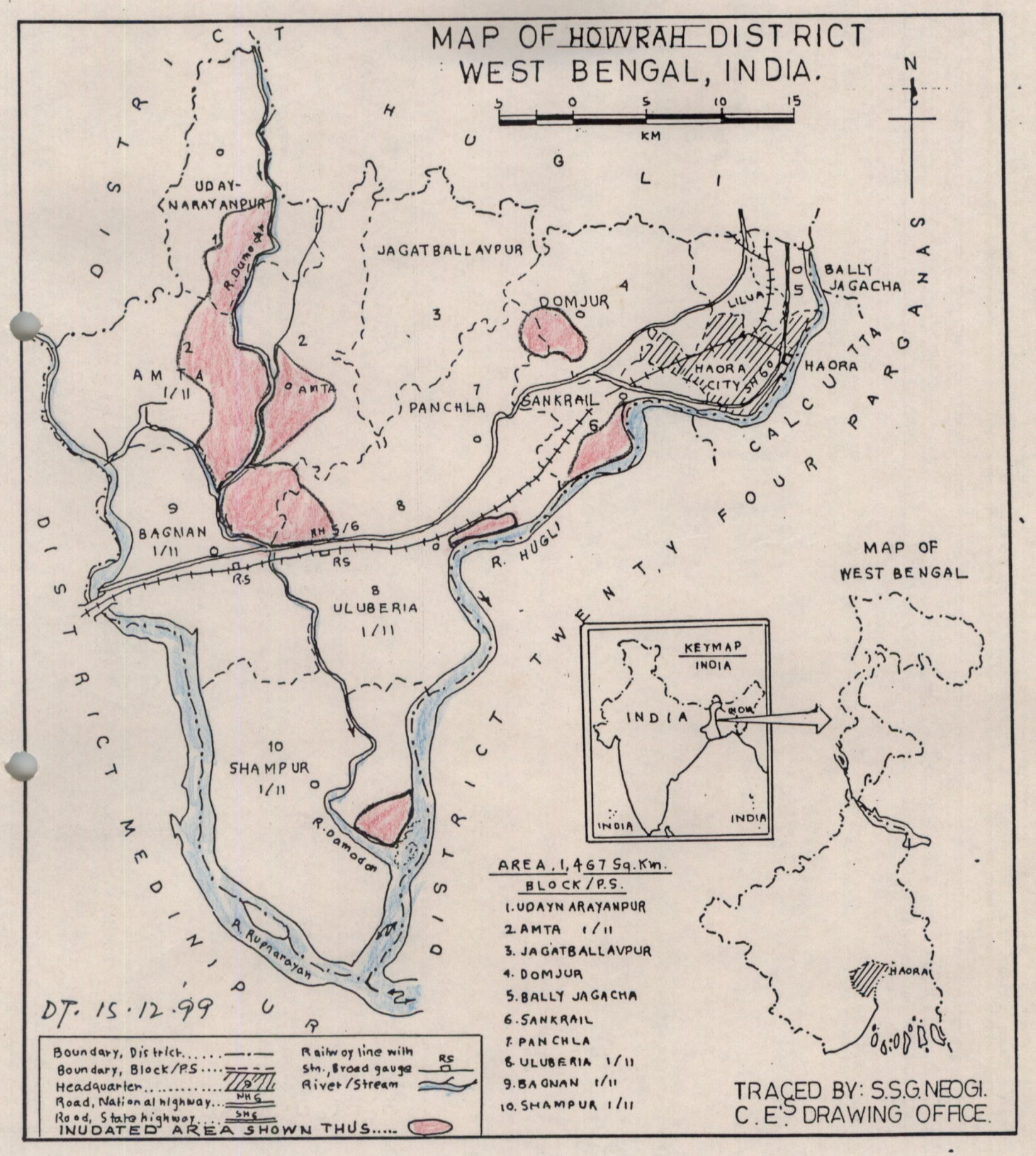
MAP OF
TWENTYFOUR PARGANAS & CALCUTTA DISTRICT

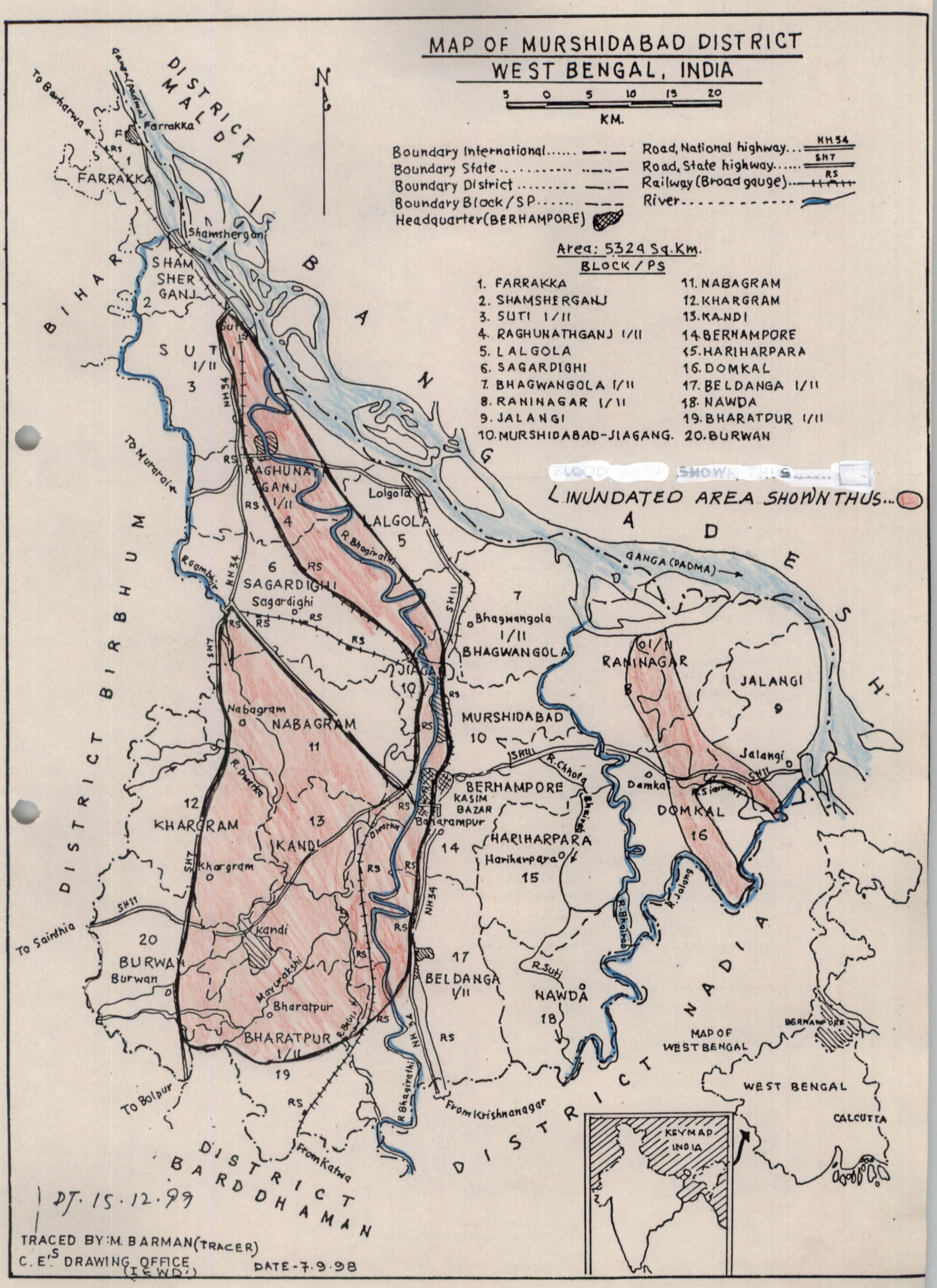


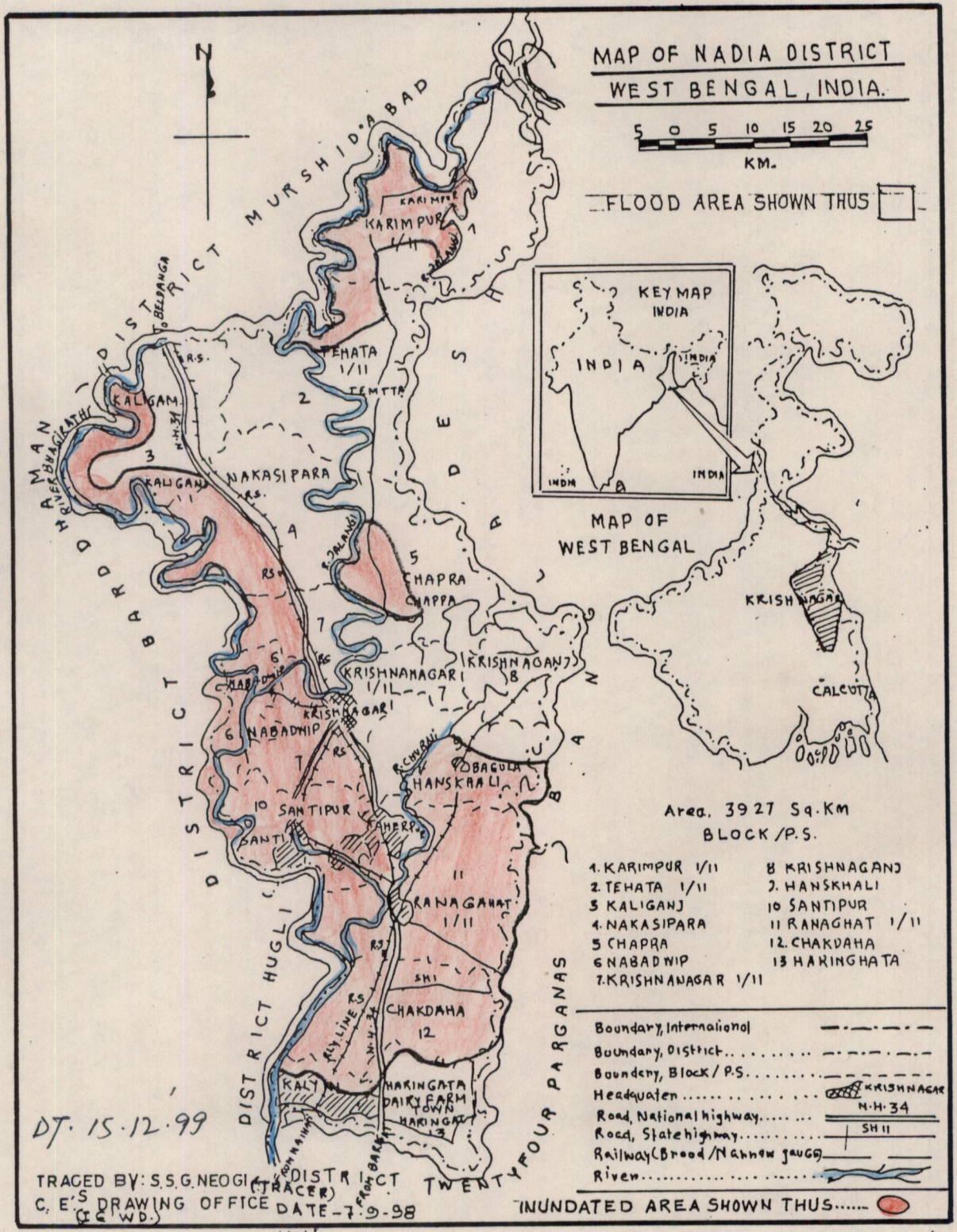
DT. 15.12.99


MAP OF MIDNAPUR DISTRICT,
WEST BENGAL, INDIA
KM.
Boundary State
Boundary Dist.
Boundary Block/P.S.
Headquarter
National highway
State highway
Railway line
River
INUNDATED AREA SHOWN THUS.
KEY MAP INDIA
INDIA
DISTRICT PURULIYA
DISTRICT BANKURA
DISTRICT HUGLI
DISTRICT HAORA
DISTRICT TWENTYFOUR PARGANAS
MAP OF WEST BENGAL
WEST BENGAL
CALCUTTA
MEDINIPUR
TO BIHAR
From Bankura
TO Bankura
R. Silai
R. Kosai
R. Subanarekhal
R. Haldi
R. Rupnarayan River
GOALTOR
GARBETA 1/II/III
CHANDRAKONA
KHARAR
KSHIRPAI
CHANDRAKONA 1/II
GHATAL
SALBONI
KESHPUR
BINPUR 1/II
DASPUR 1/II
DEBRA
KOLACHAT 1/II
JAMBANI
JHARGRAM
MEDINIPUR
PANSKURA
BAUCHAK
KHARAGPUR TOWN
KHARAGPUR 1/II
PINGLA
TAMLUK
MOYNA
SANKRAIL
GOPIBALLAYPUR 1/II
NARAYANGARH
SABONG
MAHISADAL
KESHIARY
SUTAHATA 1/II
DURGA CHAK
HALDIA
NAYAGRAM
BELDA
PATASHPUR 1/II
BHAGWANPUR 1/II
NANDIGRAM 1/II/III
DANTAN 1/II
KHEJURI 1/II
MOHANPUR
EGRA 1/II
CONTAI 1/II/III
CONTAI
RAMNAGAR 1/II
DIGHA TOWNSHIP
DIGHA
TO CUTTACK
GANGA
(HUGLI RIVER)
BAY OF BENGAL
AREA, 14081 Sq. Km.
BLOCKS/P.S.
1. BINPUR - 1/II
2. SALBONI
3. GARBETA - 1/II/III
4. CHANDRAKONA - 1/II
5. GHATAL
6. DASPUR - 1/II
7. KESHPUR
8. PANSKURA - 1/II
9. DEBRA
10. MEDINIPUR
11. JHARGRAM
12. JAMBANI
13. GOPIBALLAYPUR - 1/II
14. SANKRAIL
15. KHARAGPUR - 1/II
16. PINGLA
17. MOYNA
18. TAMLUK - 1/II
19. MAHISADAL - 1/II
20. SUTAHATA - 1/II
21. NANDIGRAM - 1/II/III
22. BHAGWANPUR - 1/II
23. SABONG
24. NARAYANGARH
25. KESHIARY
26. NAYAGRAM
27. DANTAN - 1/II
28. PATASHPUR - 1/II
29. MOHANPUR
30. EGRA - 1/II
31. CONTAI - 1/II/III
32. KHEJURI - 1/II
33. RAMNAGAR - 1/II
DT. 15.12.99


MAP OF HOOGLY DISTRICT
WEST BENGAL. INDIA.
N
5 0 5 10 15 20
KM.
KEY MAP
INDIA
INDIA
MAP OF
WEST BENGAL
HOOGHLY
AREA. 3,149 Sq. km
BLOCK/PS
1. GOGHAT I/II
2. ARAMBAG
3. KHANAKUL I/II
4. PURSURAH
5. DHANIAKHALI
6. TARAKESWAR
7. HARIPAL
8. JANGIPARA
9. PANDUA
10. DADPUR-POLBA
11. SINGUR
12. CHANDITALA I/II
13. BALAGARH
14. MAGRA-CHUNCHURA
15. SERAMPUR-UTTARPARA
Boundary District
Boundary, Block/PS
Headquater
Road. National Highway NH 2
State Highway SH 7
Railway line with station, Broad gauge RS
River/Stream
INUNDATED AREA SHOWN THUS.....
DT. 15.12.99
CE'S DRAWING OFFICE. I & W.D.
TRACED BY: S. DUTTA CHOWDHURY. DATE. 14.9.98.
DISTRICT BARDDHAMAN
DISTRICT BANKURA
DISTRICT MEDINIPUR
DISTRICT NADIA
DISTRICT TWENTY FOUR PARGANAS
DISTRICT HAORA
FROM KOLNO
To Barddhaman
To Calcutta
GOGHAT I/II
ARAMBAG
KHANAKUL I/II
PURSURAH
DHANIAKHALI
TARAKESWAR
HARIPAL
JANGIPARA
CHANDITALA I/II
SINGUR
PANDUA
DADPUR
POLBA
MAGRA
CHUNCHURA
BALAGARH
CHANDANNAGAR
BHADRESWAR
SERAMPUR
UTTARPARA
R. Mundeswari
R. Damodar
R. Dwarakeswar
R. Hugli R.
NH2
SH2
SH7
RS


MAP OF HOWRAH DISTRICT
WEST BENGAL, INDIA.
5 0 5 10 15
KM
N
DISTRICT HUGLI
UDAY-NARAYANPUR
R. Damodar
JAGATBALLAVPUR
DOMJUR
BALLY JAGACHA
LILUA
HAORA CITY
SH 6
HAORA
AMTA 1/11
AMTA
PANCHLA
SANKRAIL
CALCUTTA
FOUR PARGANAS
BAGNAN 1/11
NH 5/6
RS
R. HUGLI
ULUBERIA 1/11
DISTRICT TWENTY
DISTRICT MEDINIPUR
SHAMPUR 1/11
R. Damodar
R. Rupnarayan
MAP OF WEST BENGAL
KEYMAP INDIA
INDIA
HAORA
AREA, 1,467 Sq. Km.
BLOCK/P.S.
1. UDAYNARAYANPUR
2. AMTA 1/11
3. JAGATBALLAVPUR
4. DOMJUR
5. BALLY JAGACHA
6. SANKRAIL
7. PANCHLA
8. ULUBERIA 1/11
9. BAGNAN 1/11
10. SHAMPUR 1/11
DT. 15.12.99
Boundary, District
Boundary, Block/P.S.
Headquarter
Road, National highway
Road, State highway
Railway line with Stn., Broad gauge
River/Stream
INUDATED AREA SHOWN THUS.....
TRACED BY: S.S.G. NEOGI.
C.E.'S DRAWING OFFICE.

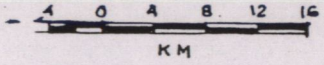

MAP OF MURSHIDABAD DISTRICT
WEST BENGAL, INDIA
5 0 5 10 15 20
KM.
Boundary International
Boundary State
Boundary District
Boundary Block / SP
Headquarter (BERHAMPORE)
Road, National highway... NH34
Road, State highway... SH7
Railway (Broad gauge)... RS
River
Area: 5324 Sq.Km.
BLOCK / PS
1. FARRAKKA
2. SHAMSHERGANJ
3. SUTI I/II
4. RAGHUNATHGANJ I/II
5. LALGOLA
6. SAGARDIGHI
7. BHAGWANGOLA I/II
8. RANINAGAR I/II
9. JALANGI
10. MURSHIDABAD-JIAGANG.
11. NABAGRAM
12. KHARGRAM
13. KANDI
14. BERHAMPORE
15. HARIHARPARA
16. DOMKAL
17. BELDANGA I/II
18. NAWDA
19. BHARATPUR I/II
20. BURWAN
FLOOD AREA SHOWN THUS
INUNDATED AREA SHOWN THUS
DISTRICT MALDA
DISTRICT BIRBHUM
DISTRICT NADIA
DISTRICT BARDDHAMAN
BIHAR
BANGLADESH
GANGA (PADMA)
To Berharwa
Farrakka
FARRAKKA
Shamshergani
SHAMSHERGANJ
SUTI I/II
To Murarai
RAGHUNATHGANJ I/II
Lolgola
LALGOLA
R. Bhagirathi
Raambhia
SAGARDIGHI
Sagardighi
Bhagwangola
BHAGWANGOLA
JIAGANJ
Nabagram
NABAGRAM
MURSHIDABAD
R. Dwarka
R. Chhora
BERHAMPORE
KASIM BAZAR
Baharampur
KHARGRAM
Khargram
KANDI
HARIHARPARA
Hariharpara
RANINAGAR
JALANGI
Jalangi
Damka
DOMKAL
R. Jalang
R. Bhairab
R. Suti
NAWDA
BELDANGA I/II
To Sainthia
Kandi
BURWAN
Burwan
Bharatpur
BHARATPUR I/II
To Bolpur
From Krishnanagar
From Katwa
NH34
SH11
SH7
RS
MAP OF WEST BENGAL
BERHAMPORE
WEST BENGAL
CALCUTTA
KEYMAP INDIA
DT. 15.12.99
TRACED BY: M. BARMAN (TRACER)
C.E.'S DRAWING OFFICE (I&WD)
DATE-7.9.98



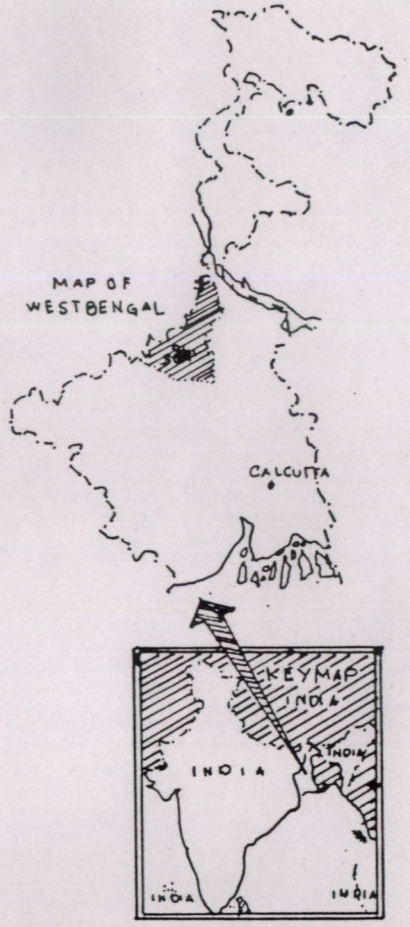
DT. 15.12.99

TRACED BY: S.S.G. NEOGI (TRACER)
C.E.'S DRAWING OFFICE (I.C.W.D.)
DATE - 7.9.98

MAP OF BIRBHUM DISTRICT
WEST BENGAL, INDIA



Boundary State
" District
" Block / P.S.
Headquarter, District
State Highway
Important Metalled road
Railway Line with Station (Broad gauge)
" " " " (Narrow gauge)
River and Stream
INUNDATED AREA SHOWN THUS.....



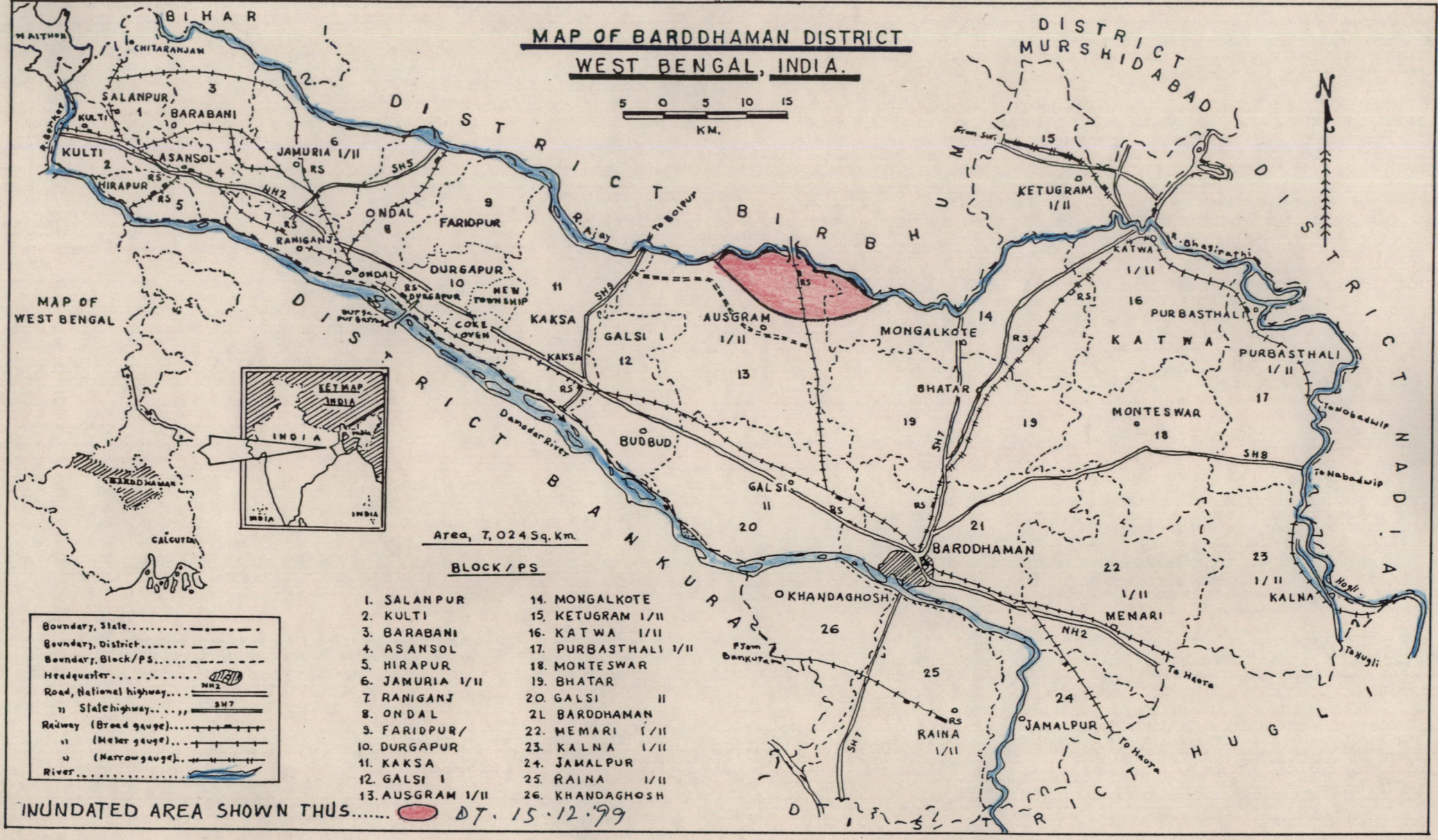
AREA, 4,545 Sq. Km.

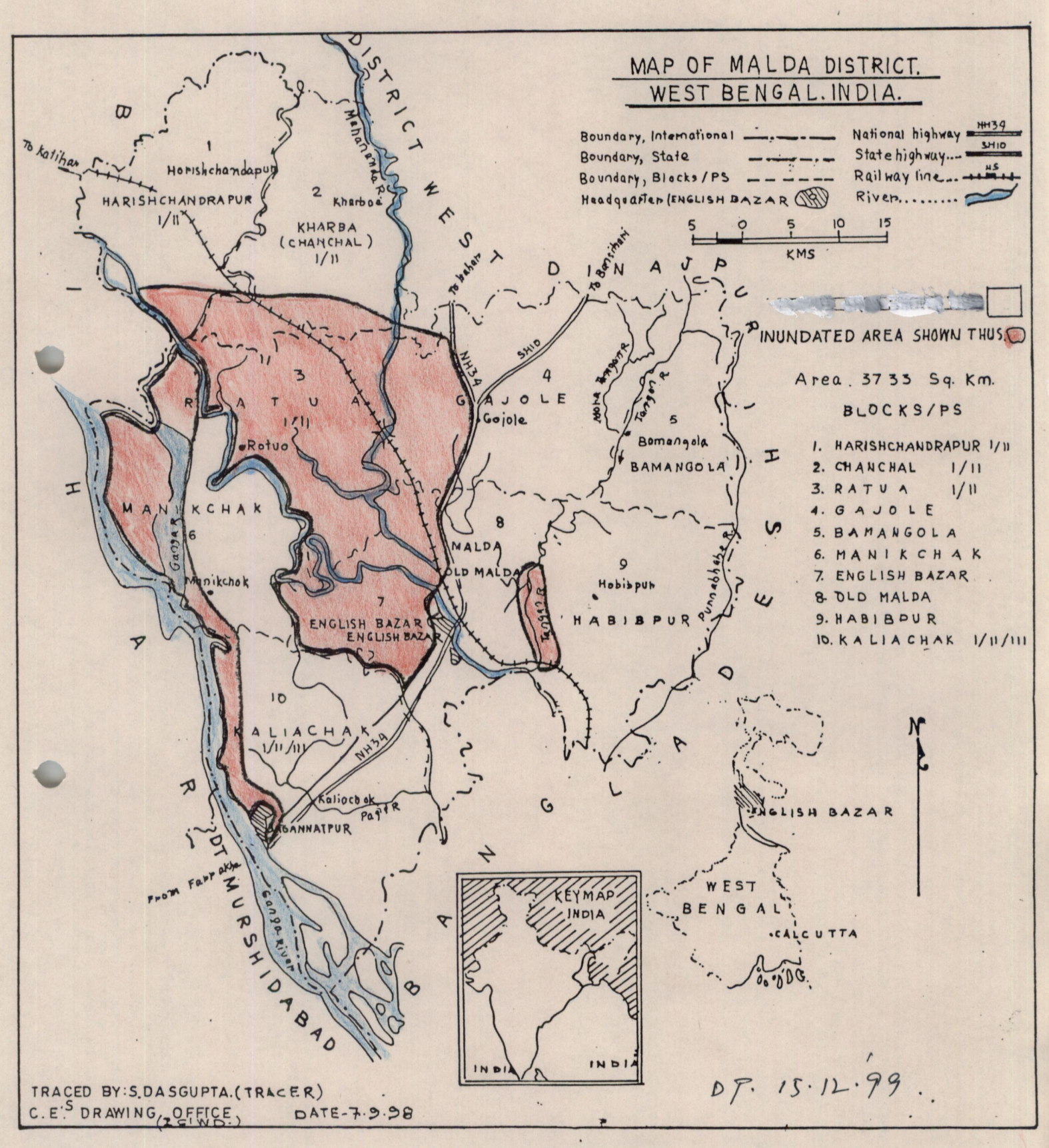
BLOCKS/P.S.

1	MURAROI I/II	8	RAJNAGAR
2.	NALHATI I/II	9	KHOYRASOLE
3	RAMPURHAT I/II	10	DUBRAJPUR
4.	MUHAMMAD BAZAR	11	ILLAMBAZAR
5	MAYURESWAR I/II	12	BOLPUR (SRIHIKETAN)
6	SAINTHIA	13	LABHPUR
7	SURI . . . I/II	14.	NANOOR.

dt. 15/12/99

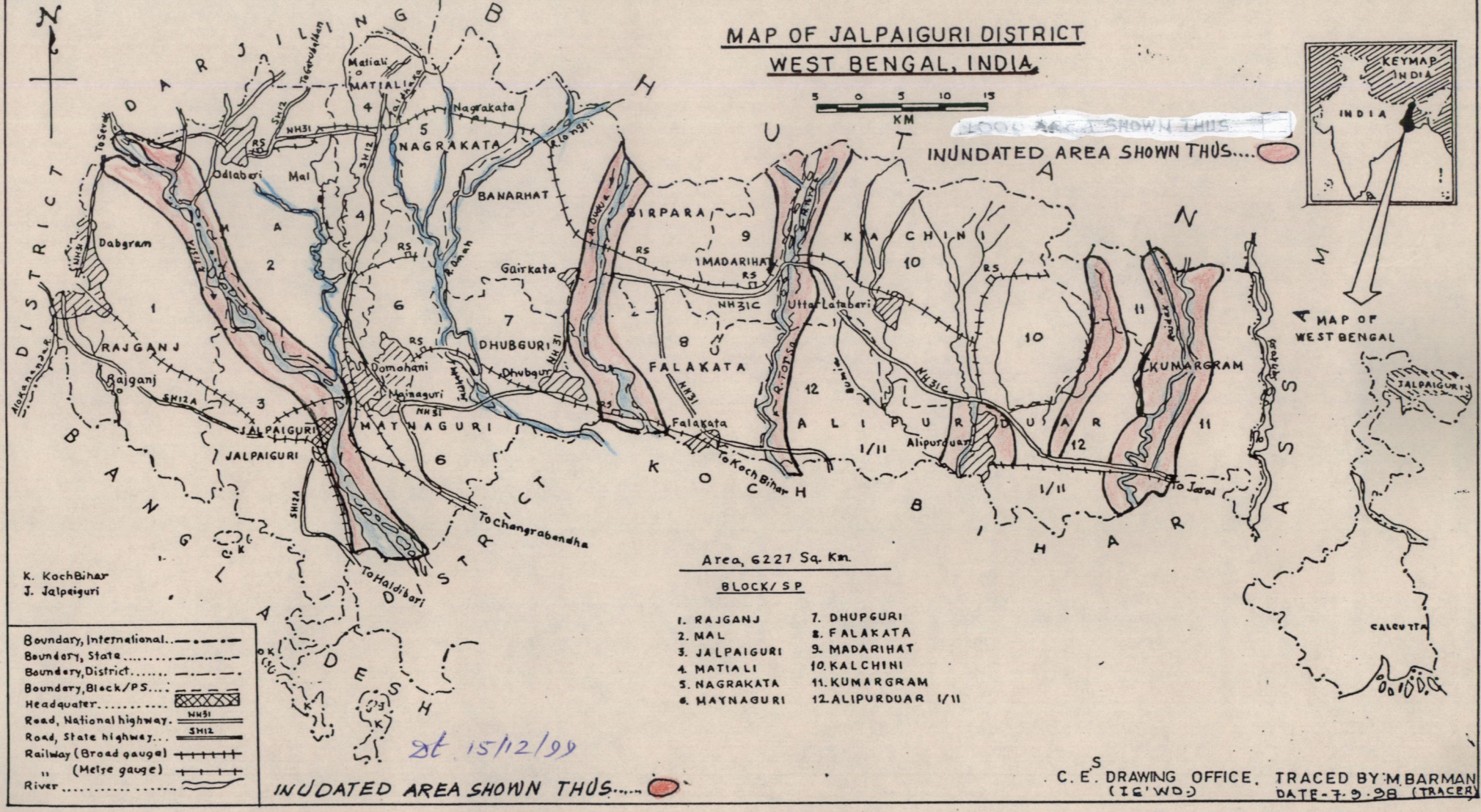
TRACED BY FROM
C.E. ORAING BRACH IE W.D.


MAP OF BARDDHAMAN DISTRICT
WEST BENGAL, INDIA.
5 0 5 10 15
KM.
N
BIHAR
DISTRICT MURSHIDABAD
DISTRICT BIRBHUM
DISTRICT BANKURA
DISTRICT NADIA
DISTRICT HUGLI
MAP OF WEST BENGAL
MAITHON
CHITARANJAN
SALANPUR
BARABANI
KULTI
ASANSOL
HIRAPUR
JAMURIA 1/11
RANIGANJ
ONDAL
FARIDPUR
DURGAPUR
NEW TOWNSHIP
COKE OVEN
KAKSA
GALSI I
AUSGRAM 1/11
MONGALKOTE
BHATAR
BUDBUD
GALSI II
BARDDHAMAN
KHANDAGHOSH
RAINA 1/11
JAMALPUR
MEMARI
KALNA
KATWA 1/11
PURBASTHALI 1/11
MONTESWAR
KETUGRAM 1/11
KATWA
PURBASTHALI
To Bolpur
R. Ajay
R. Bhagirathi
Damodar River
From Bankura
To Haora
To Nabadwip
To Hugli
Hugli
KETMAP INDIA
INDIA
BARDDHAMAN
CALCUTTA
Area, 7,024 Sq. Km.
BLOCK / PS
1. SALANPUR
2. KULTI
3. BARABANI
4. ASANSOL
5. HIRAPUR
6. JAMURIA 1/11
7. RANIGANJ
8. ONDAL
9. FARIDPUR/
10. DURGAPUR
11. KAKSA
12. GALSI I
13. AUSGRAM 1/11
14. MONGALKOTE
15. KETUGRAM 1/11
16. KATWA 1/11
17. PURBASTHALI 1/11
18. MONTESWAR
19. BHATAR
20. GALSI II
21. BARDDHAMAN
22. MEMARI 1/11
23. KALNA 1/11
24. JAMALPUR
25. RAINA 1/11
26. KHANDAGHOSH
Boundary, State
Boundary, District
Boundary, Block/PS
Headquarter
Road, National highway
" State highway
Railway (Broad gauge)
" (Meter gauge)
" (Narrow gauge)
River
INUNDATED AREA SHOWN THUS
DT. 15.12.'99

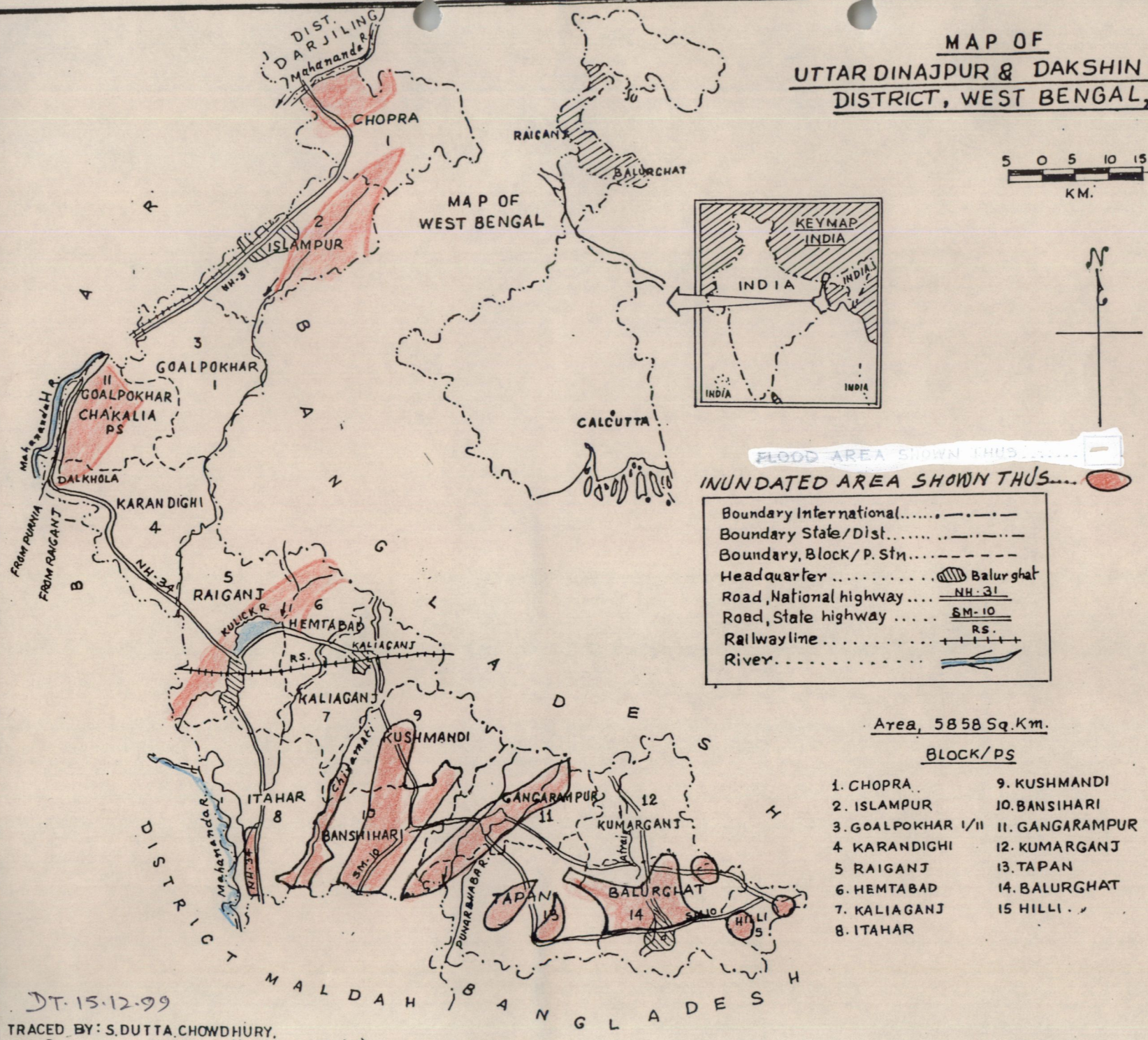


TRACED BY: S. DASGUPTA. (TRACER)
C.E.'S DRAWING OFFICE (I&CAD.) DATE-7.9.98

DT. 15.12.99.


MAP OF JALPAIGURI DISTRICT
WEST BENGAL, INDIA
5 0 5 10 15
KM
INUNDATED AREA SHOWN THUS....
KEYMAP INDIA
INDIA
MAP OF WEST BENGAL
DARJILING
BHUTAN
DISTRICT
BANGLADESH
KOCH BIHAR
ASSAM
MATIALI
NAGRAKATA
BANARHAT
BIRPARA
MADARIHAT
KALCHINI
RAJGANJ
JALPAIGURI
MATNAGURI
DHUBGURI
FALAKATA
ALIPURDUAR
KUMARGRAM
Matiali
Nagrakata
Odlabari
Mal
Dabgram
Rajganj
Gairkata
Domohani
Mainaguri
Dhubguri
Falakata
Uttar Lataberi
Alipurduar
To Jaral
To Koch Bihar
To Chengrabandha
To Haldibari
To Sevak
To Gerubathan
Alokanandar
JALPAIGURI
CALCUTTA
Area, 6227 Sq. Km.
BLOCK/SP
1. RAJGANJ
2. MAL
3. JALPAIGURI
4. MATIALI
5. NAGRAKATA
6. MAYNAGURI
7. DHUPGURI
8. FALAKATA
9. MADARIHAT
10. KALCHINI
11. KUMARGRAM
12. ALIPURDUAR 1/11
K. KochBihar
J. Jalpaiguri
Boundary, International
Boundary, State
Boundary, District
Boundary, Block/PS
Headquater
Road, National highway
Road, State highway
Railway (Broad gauge)
" (Metre gauge)
River
INUDATED AREA SHOWN THUS.....
Dt. 15/12/99
C. E. S. DRAWING OFFICE. (IG'WD.)
TRACED BY M. BARMAN
DATE-7.9.98 (TRACER)

MAP OF
UTTAR DINAJPUR & DAKSHIN DINAJPUR
DISTRICT, WEST BENGAL, INDIA.



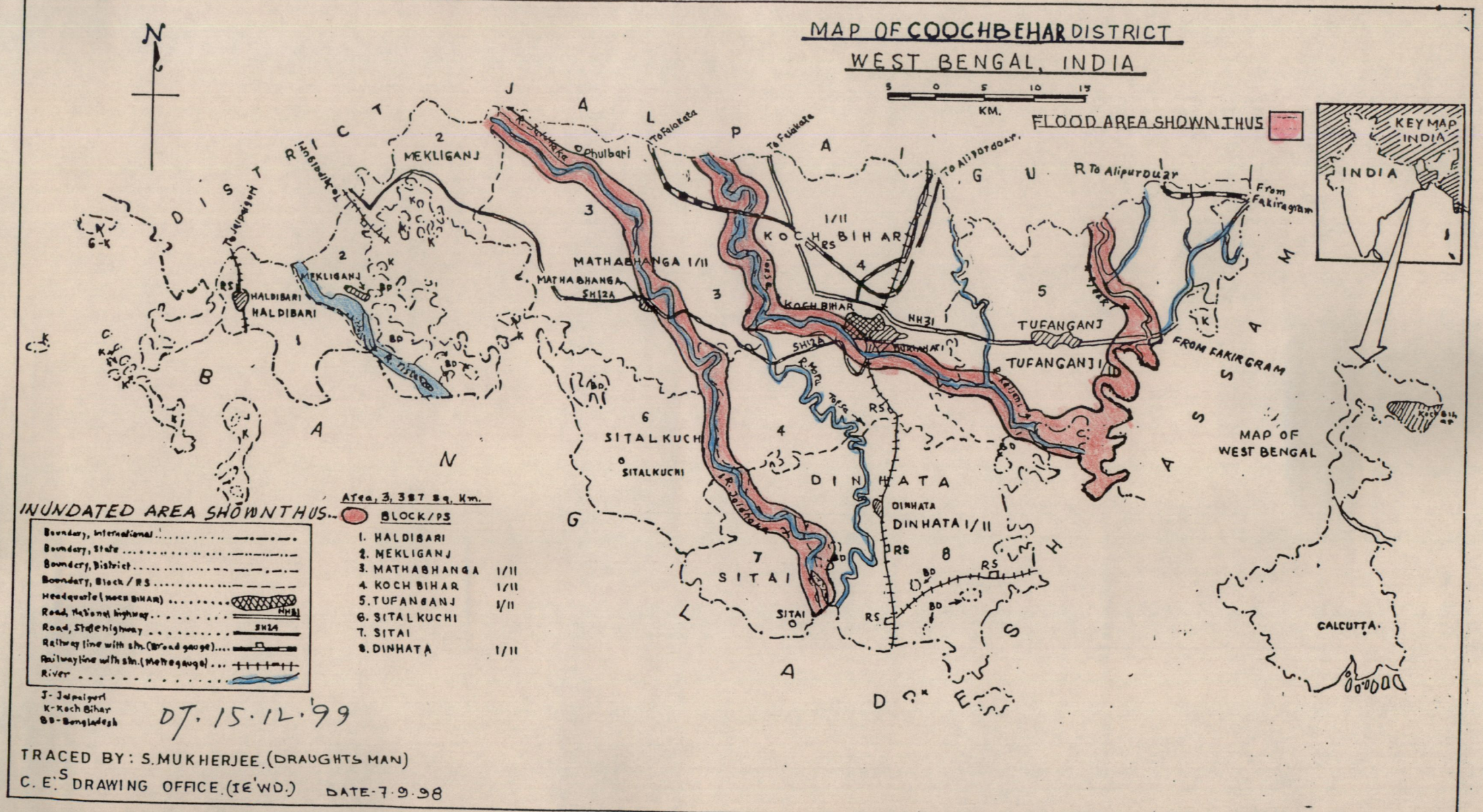
Area, 5858 Sq.Km.

BLOCK/PS

1. CHOPRA	9. KUSHMANDI
2. ISLAMPUR	10. BANSIHARI
3. GOALPOKHAR I/II	11. GANGARAMPUR
4. KARANDIGHI	12. KUMARGANJ
5. RAIGANJ	13. TAPAN
6. HEMTABAD	14. BALURGHAT
7. KALIAGANJ	15. HILLI
8. ITAHAR	

DT. 15.12.99

TRACED BY: S. DUTTA CHOWDHURY.
C. E.'S DRAWING OFFICE (DRAUGHTSMAN) DATE. 7.9.98
(T.S.W.O.)



DT. 15.12.'99

TRACED BY: S. MUKHERJEE. (DRAUGHTS MAN)

C. E. S DRAWING OFFICE. (I&WD.) DATE-7.9.98

RIVER RESEARCH INSTITUTE

MAP SHOWING PROPOSED HYDROLOGICAL OBSERVATION SITES ALONG WITH EXISTING SITES OF WEST BENGAL

SCALE 0 8 16 MILES

EXISTING GAUGE DISCHARGE & SILT OBSERVATION SITES

A ... GAUGE

B ... GAUGE & DISCHARGE

C ... GAUGE DISCHARGE & SILT

SL NO	RIVER	STATION		SL NO	RIVER	STATION	
1	TEESTA	CHUNGTHANG	A	81	AJOY	BUDRA	A
2	"	DIKCHU	C	82	"	NUTANHAT	B
3	"	RANGPO	C	83	"	KATWA	C
4	"	TEESTABAZAR	C	84	DAMODAR	DURGAPUR	B
5	"	CORONATION BRDG.	C	85	"	RANDIA	B
6	"	RANGDHAMALI	A	86	"	SILNA	A
7	"	KATHANBARI	A	87	"	UJJURY	A
8	"	DOMOHANI	B	88	"	JHANPUR	A
9	"	KING'S GHAT	A	89	"	EDILPUR	A
10	"	MANDALGHAT	A	90	"	AMIRPUR	A
11	"	MEKHLIGANJ	A	91	"	PALLA	A
12	RANGPO	RANGPO	A	⊗ 92	"	JAMALPUR	A
13	GREAT RANGIT	NAYABAZAR	C	93	"	SUREKALIA	B
14	RAMAN	SINGLA BAZAR	C	94	"	MAHINDAPUR	B
15	LISH	NH31 RD. BRDG. SITE	C	95	DARAKESWAR	ARAMBAG	A
16	GHISH	-DO-	C	⊗ * 96	"	BHUKIBAGA	C
17	CHEL	-DO-	C	97	SILLI	GODGHAT	A
18	NEORA	-DO-	C	98	PUNARBHABA	BANDAR	A
19	JALDHAKA	NAGRA-KATA RD. BRDG	C	99	"	RANICHAK	A
20	"	MANSAIGHATA	C	100	"	GOPIGANJ	A
⊗ 21	"	M/D RD. BRDG.	A	⊗ 101	"	DINAN	A
⊗ 22	DIANA	CHANGMARI RD. BRDG.	C	102	"	GANGAKALI OUTFAL	A
23	TORSA	KESHAB ASHRAM	A	⊗ 103	"	SWADIGHAT	A
⊗ 24	"	HASIMARA RLY. BRDG.	C	⊗ 104	"	PAIRATUNGI	A
⊗ 25	"	GHUGUMARI RLY. BRDG	C	⊗ 105	"	DANIPUR	A
⊗ 26	SONKOSH	SANKOSH	C	⊗ 106	"	GEONKHALI	A
27	SILTORSA	SILBANIHAT	A	⊗ * 107	MUNDESWARI	HARINKHOLA	B
28	CHARTORSA	CHARTORSA GHAT	A	* 108	KANGSABATI	PURULIA	C
⊗ 29	KALJANI	ALIPURDUAR	C	⊗ * 109	"	TUSAMI	C
30	"	ASSAM ACCESS RD.	A	110	"	MOHANPUR	B
⊗ 31	RAIDAK I	CHAPANI RLY. BRDG.	C	111	"	PANSKURA	B
⊗ 32	" II	TELIPARA RLY CROSSING	C	⊗ * 112	KUMARI	TETLA	C
33	RAIDAK	KUMARGRAM	C	113	KALIAGHAI	AMGACHHIA	A
34	" (LOWER)	TUFANGANJ	A	114	"	KALIMANDAP	A
35	" (UPPER)	NEWLAND T.E.	A	115	HALDI	ETAMOGRA	A
36	MAHANANDA	SILIGURI	C	116	"	TEROPEKHIA	A
⊗ 37	"	ENGLISH BAZAR	A	117	RASULPUR	KALINAGAR	A
38	KALINDRI	NIMABARAI	A	118	TOLLY'S NULAH	GARIA	A
⊗ 39	TANGAN	BANSIBARI	B	119	TOLLY'S NULAH	RUPSA	A
40	"	RADHIKAPUR	B	120	"	TOLLYGANJ BRDG	A
41	"		A	121	"	HAOTIGO BRDG.	A
⊗ 42	PUNARBHABA	GANGARAMPUR	B	⊗ 122	ICHHAMATI	TENTULA	A
⊗ 43	ATRAI	PITARAMPUR BALURGHAT	B	⊗ 123	"	BASIRHAT	A
44	GANGA		A	⊗ 124	"	HASNABAD	A
45	"		A	⊗ 125	"	KALINAGAR	A
46	"	FARAKKA	C	126	MATLA	CANNIG	A
47	"	DHULIAN	A	127	PEALI	HOBKA SLUICE	A
⊗ 48	"	CHAKGHAT	A	⊗ * 128	KALIGUNG	NAWA KUNTI JN.	B
⊗ 49	"	NURPUR	A	⊗ * 129	"	HAROAHAT	B
50	"	BISHWANATHPUR	A	⊗ * 130	"	MALANCHA	A
⊗ 51	"	JALLANGI BAZAR	A	⊗ * 131	"	GRISIGHATA	A
⊗ 52	BHAGIRATHI	NURPUR	A	⊗ * 132	"	BERMATORE	A
53	"	BISWANATHPUR	A	⊗ 133	"	GOMAKNIA	A
⊗ 54	"	GERIA	A				
⊗ 55	"	JANGIPUR	A				
⊗ 56	"	BERHAMPUR	A				
⊗ 57	"	KATWA	A				
⊗ 58	BHAIRAB	AKHRIGANJ	A				
⊗ 59	HOOGHLY	KANSPUKUR	A				
60	"	TRIBENI	A				
61	"	CHITPUR LOCK	A				
62	"	GARDEN REACH	A				
63	"	MANIKKALI	A				
64	"	ASWRA	A				
65	"	SELUBERIA	A				
66	"	ULUBERIA	A				
67	"		A				
68	"	HOOGHLY GHAT	A				
69	"		A				
70	"	BALAM	A				
71	"	GANGOA	A				
72	"	BASAN	A				
73	JALLANGI	KRISHNANAGAR	A				
⊗ 74	"	SWARUPGANJ	A				
⊗ 75	CHURNI	HANSKHALI	A				
⊗ 76	AJAY	PANDABESWAR	A				
⊗ 77	"	BETA	A				
⊗ 78	"		A				
⊗ * 79	"	ILLAMBAZAR	C				
80	"	MALIARA	A				

⊗ DATA BASIN RECEIVED BY R.R.

* STATION CONTROLLED BY R.O.

PROPOSED GAUGE & DISCHARGE & SILT OBSERVATION SITES

A ... GAUGE

B ... GAUGE DISCHARGE & SILT

SL NO	RIVER	STATION
1	KALJANI	BALARAMPUR (BELOW CONFLUENCE WITH TORSA) .. b
2	DHARLA	NEAR DINHATA .... b
3	JALDHAKA	NEAR GOSANMARI .... b (ROAD CROSSING OF SITALKUCHI TO DINHATA)
4	RAIDAK	BELOW TUFANGANJ ... b
5	MAHANANDA	ENGLISH BAZAR ... b
6	NAGAR	ROAD CROSSING BETWEEN RAIGANJ AND DALKHOLA .. b
7	DWARKA	BELOW CONFLUENCE WITH CHILLA NADI .... a
8	"	BELOW CONFLUENCE WITH BRAHMANI ... b
9	"	BELOW CONFLUENCE WITH DAOKI RIVER ... a
10	DAOKI	ROAD CROSSING NEAR KANDI ... b
11	MAYURAKSHI	SAINTHIA ... b
12	"	ABOVE CONFLUENCE WITH KAYA RIVER ... a
13	KOPAI	BELOW JUNCTION WITH BAKRESWAR RIVER ... a
14	AJOY	ABOVE PANDABESWAR NEAR W.BENGAL BIHAR BORDER (NEAR GHURULIA) ... a
15	KUNUR	ABOVE JUNCTION WITH AJOY RIVIER ... b
16	JALLANGI	AMTALA NEAR SURTI JUNCTION
17	"	KRISHNANAGAR ... b
18	DARAKESWAR	BANKURA ROAD CROSSING . b
19	"	" " BELOW OUTFAL OF ASIA NADI NEAR BISHNUPUR . a
20	SILABATI	ROAD CROSSING NEAR GARBETA . b
21	AMODAR NADI	ABOVE JUNCTION WITH DARAKESWAR ... a
22	KANGSABATI	SIJUA (BELOW TARAFINI JUNCTN) .. b
23	KHARI	BELOW CONFLUENCE WITH BANKA RIVER ... b
24	GHEA	ABOVE CONFLUENCE WITH KUNTI RIVER ... a
25	RUPNARAYAN	DAINAN (IN KOLAGHAT RD. BRDG) .. b
26	HURHURA	ABOVE OUTFAL ON RUPNARAYAN . b
27	PANSURI KHAL OR CHABBISBIGRA KHL	ABOVE OUTFAL ON RUPNARAYAN ... b
28	KALIAGHAI	BELOW GHANDIA KHAL JUNCTION ... b
29	"	BELOW BAGHAI KL JUNGTN ... a
30	SUBARNAREKHA	NAYAGRAM (BELOW DOLONG JUNCTION) ... b
31	DOLONG	ABOVE OUTFAL ON SUBARNAREKHA ... a

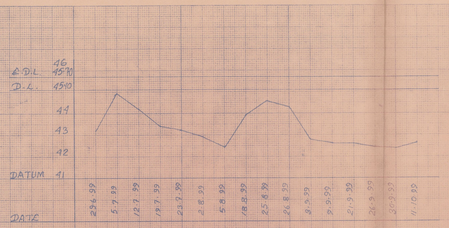
M-R-16/90

16.4.90

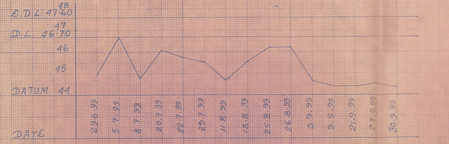
DRG. NO :- M-R-16/90

DATE 16.4.90

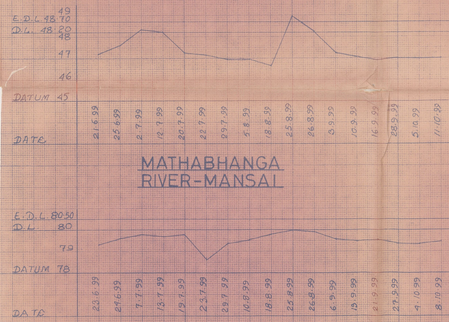
IMPORTANT GAUGE LEVEL OF RIVERS DURING FLOOD SEASON OF 1999



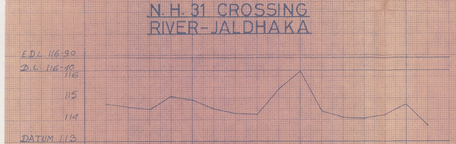
ALIPURDUAR
RIVER-KALJANI



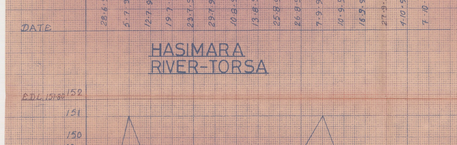
L. R. P CROSSING
RIVER-RAIDAK-I



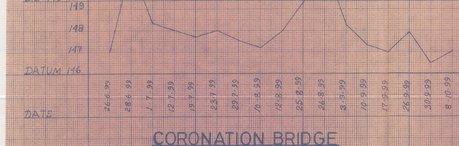
MATHABHANGA
RIVER-MANSAI



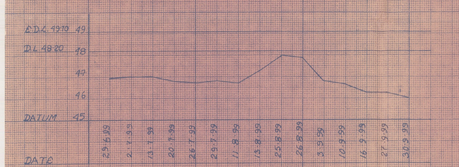
N.H. 31 CROSSING
RIVER-JALDHAKA



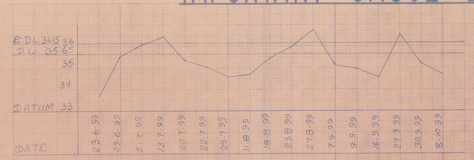
HASIMARA
RIVER-TORSA



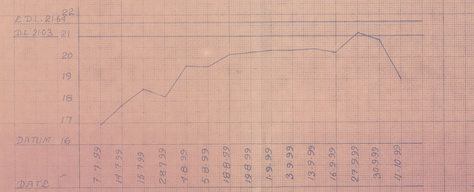
CORONATION BRIDGE
RIVER-TEESTA



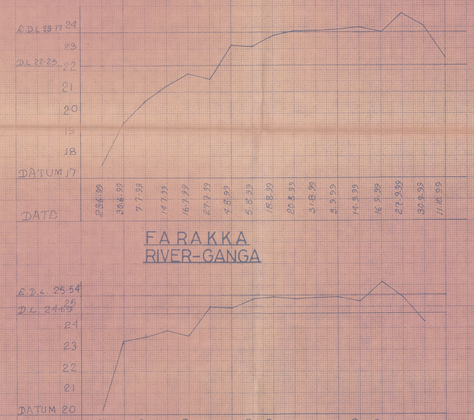
L. R. P. CROSSING
RIVER-SANKOSH



DANGRAGHAT
RIVER-MAHANANDA

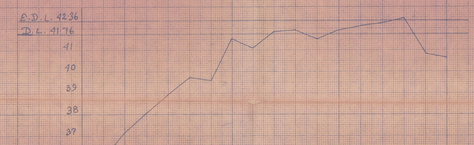


NURPUR
RIVER-GANGA

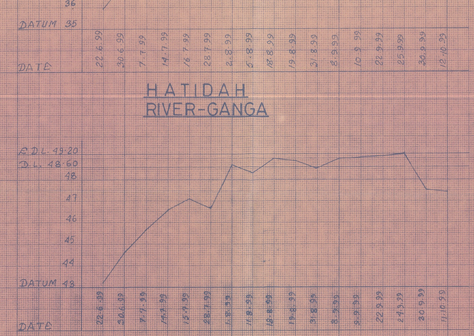


FARAKKA
RIVER-GANGA

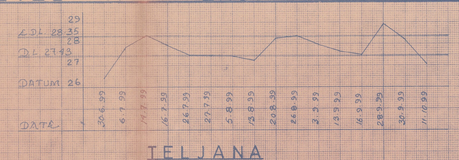
MANIKCHAK GHAT
RIVER-GANGA



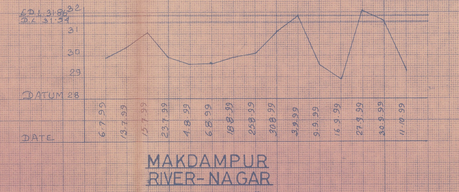
HATIDAH
RIVER-GANGA



P A T N A
RIVER-GANGA

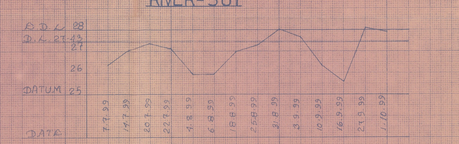


T E L J A N A
RIVER-FULAHAR

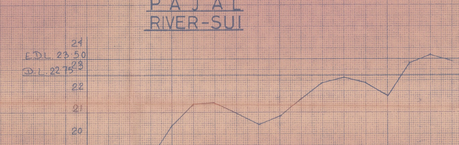


MAKDAMPUR
RIVER-NAGAR

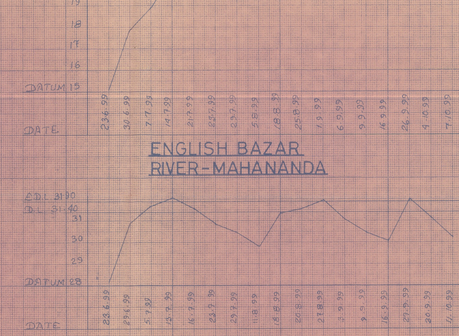
BANSHIHARI
RIVER-TANGON



KACHUA
RIVER-SUI

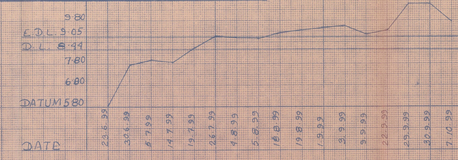


P A J A I
RIVER-SUI

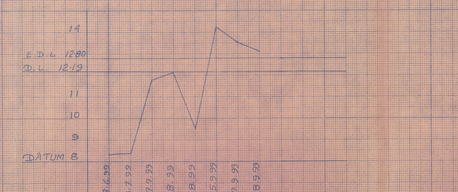


ENGLISH BAZAR
RIVER-MAHANANDA

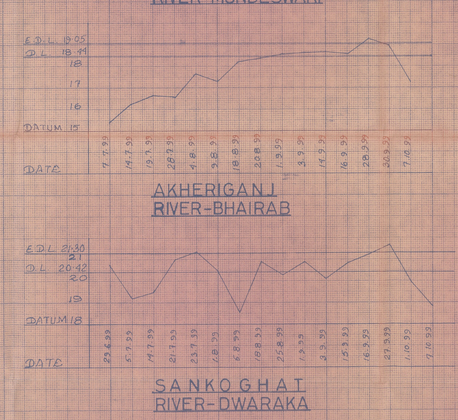
G H O W A
RIVER-MAHANANDA



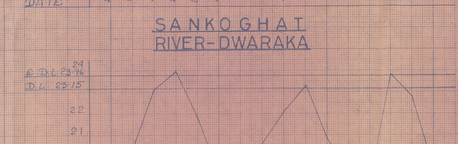
SWARUPGANJ
RIVER-JALANGI



HARINKHOLA
RIVER-MUNDESWARI

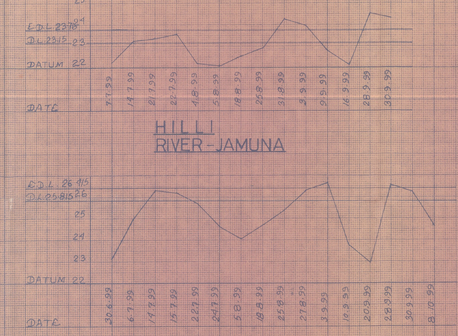


AKHERIGANJ
RIVER-BHAIRAB



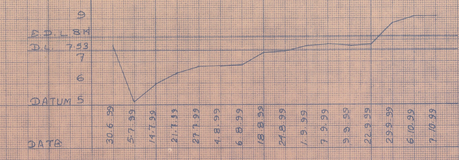
SANKOGHAT
RIVER-DWARAKA

BALURGHAT
RIVER-ATRAI

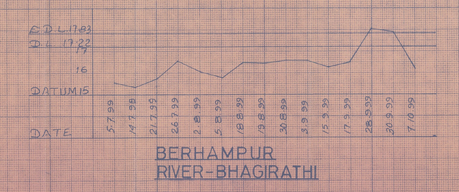


HILLI
RIVER-JAMUNA

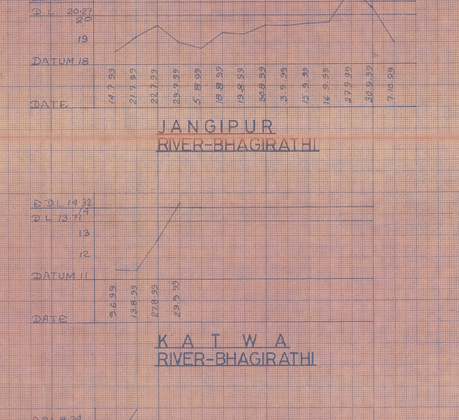
GANGARAMPUR
RIVER-PUNARBHAVA



HASKHALI
RIVER-CHURNI

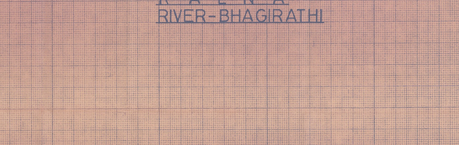


BERHAMPUR
RIVER-BHAGIRATHI



JANGIPUR
RIVER-BHAGIRATHI

K A T W A
RIVER-BHAGIRATHI



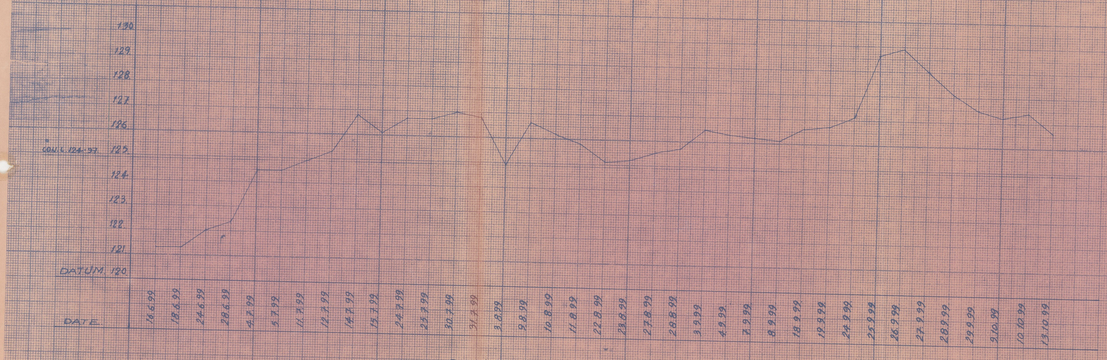
K A L N A
RIVER-BHAGIRATHI

DRAWN BY :- (T. K. MANDAL)
DRAUGHTSMAN
C.E.S DRAWING OFFICE

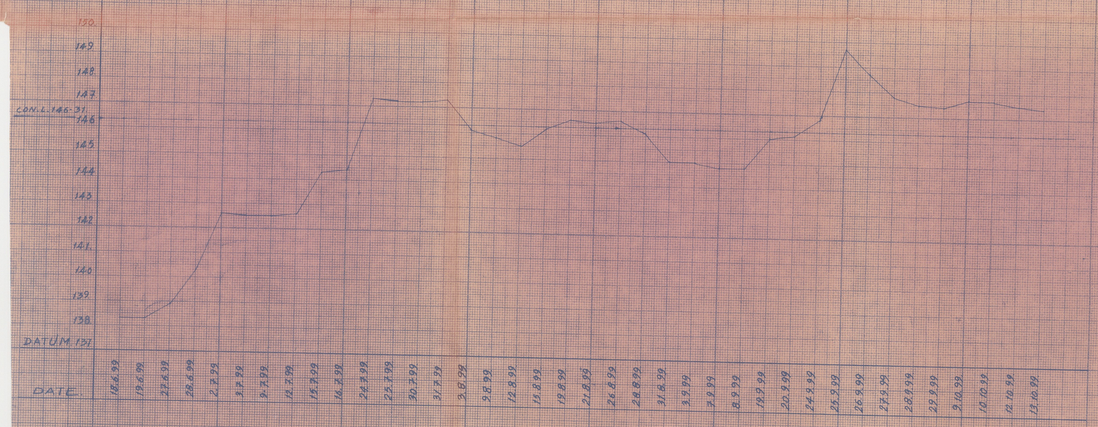
(A. BHATTACHARYA)
A. BHATTACHARYA
EXECUTIVE ENGINEER
C.E.S DRAWING OFFICE

ALL DIMENSIONS ARE IN METRE , SCALE :- 1:100

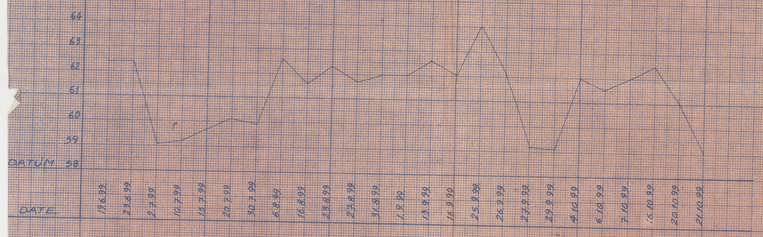
IMPORTANT RESERVOIR AND BARRAGE AND OUTFLOW DATA DURING THE FLOOD SEASON OF 1999



PANCHET RESERVOIR

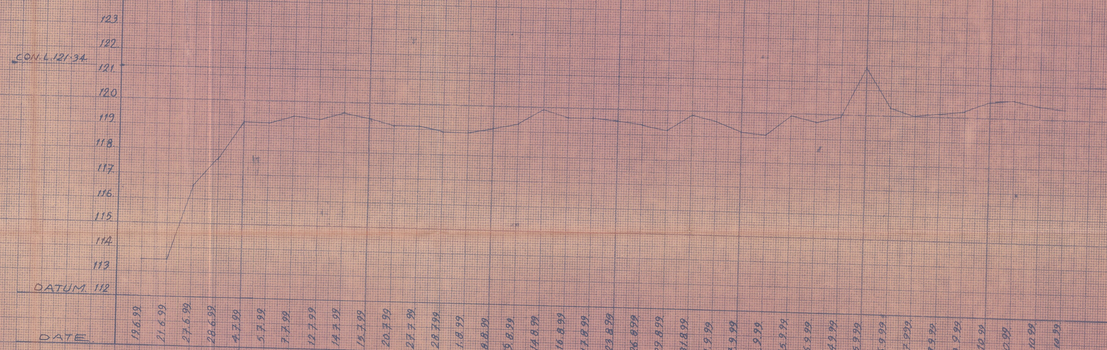


MAITHON RESERVOIR



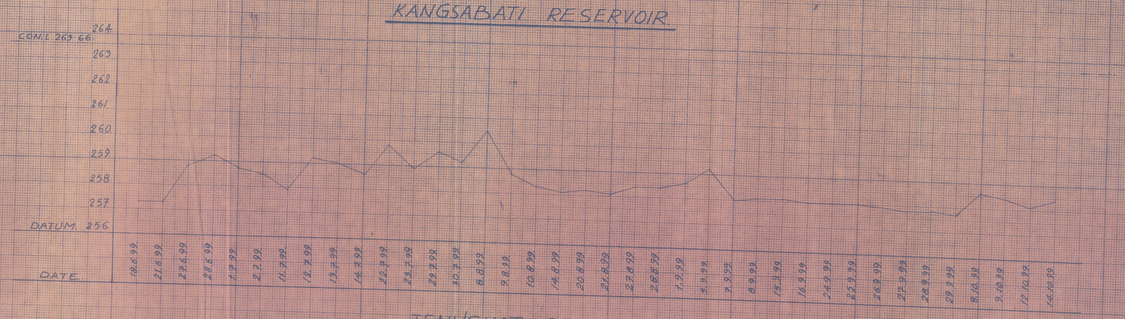
TILPARA BARRAGE.

DURGAPUR BARRAGE.



MASSANJORE RESERVOIR

KANGSABATI RESERVOIR



TENUGHAT RESERVOIR

(ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.)

DRAWN BY: S. DUTTA CHOWDHURY
(DRAUGHTSMAN)
C.E.'S DRG. OFFICE. DATE: 17.11.99.

A. BHATTACHARYA
EXECUTIVE ENGINEER
G.E.'S DRAWING OFFICE.

WEST BENGAL

SCALE – 1:1000000

1 CENTIMETRE - 10 KILOMETRES

LEGENDS

1. INTERNATIONAL BOUNDARY
2. STATE BOUNDARY
3. DISTRICT BOUNDARY
4. RIVER
5. RESERVOIR
6. RLY LINE
7. NH

INUNDATED AREA SHOWN THUS....

85° 86° 87° 88° 89° 90°

28° 27° 26° 25° 24° 23° 22° 21°

GANGTOK THIMPHU

ILAM DARJILING KALIMPANG DARJILING KAPSIYANG SHILIGURI JHAPA JALPAIGURI JAIPAIGURI ISLAMPUR KISHANGANJ KOCHBIHAR DINHATA

PURNEA KATIHAR GANGA BHAGALPUR SANTAL PARGANAS DINAJPUR RAIGANJ WEST DINAJPUR BALURGHAT RANGPUR MALDAH INGRAJBAZAR BOGRA RAJSHAHI

MASSANJORE RESERVOIR BARAKAR KONAR RESERVOIR DHANBAD MAITHON RESERVOIR PANCHET RESERVOIR BIRBHUM SIURI ASANSOL RANIGANJ DURGAPUR BOLPUR BARDDHAMAN MURSHIDABAD AJIMGANJ BAHARAMPUR KANDI KUSHTIA NADIA NAVADWIP KRISHNANAGAR SHANTIPUR JESSORE KALNA RANAGHAT BAGDAHA CHAKDAHA BANGAON

RANCHI PURULIYA PURULIYA BANKURA BISHNUPUR JAMSHEDPUR SINGHBHUM RAIPUR GHATAL HUGLI CHUNCHURA NAIHATI GOBARDANGA BARAKPUR BARASAT BARANAGAR BASIRHAT CALCUTTA ALIPUR KHULNA HAORA ULUBERIYA

MEDINIPUR JHARGRAM KHARAGPUR TAMLUK KANTHI TWENTY FOUR PARGANAS DIAMOND HARBOUR SUNDARBANS

MAYURBHANJ BALASORE CUTTACK ORISSA COASTAL CANAL SUBARNAREKHA BAY OF BENGAL

RIVERS: TEESTA, RANGIT, KOSI, MAHANANDA, KARATOYA, TORSA, KALJANI, RAIDAK, JALDHAKA, JAINTI, PUNARBHABA, CHIRAMATI, TANGON, KULIK, PAGLA, GUMANI, BRAHMANI, PAKURIA, DWARKA, MAYURAKSHI, KOPAI, KUYE, AJAY, KUNOOR, DAMODAR, DWARESWAR, KASAI, SILABATI, RUPNARAYAN, KELAGHAI, KAPALESWARI, SUBARNAREKHA, HALDI, HUGLI, BARATALA, SAPTAMUKHI, JAMIRA, MATLA, BANGADURI, GOSABA, HARINGHATA, BIDYADHARI, HARINGHATA, BHAGIRATHI, JALANGI, CHURNI, MATLA

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