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ANNUAL FLOOD REPORT - 1997

IRRGATION AND WATERWAYS DIRECTORATE

GOVERNMENT OF WEST BENGAL

CALCUTTA.....February.....1998

ANNUAL FLOOD REPORT OF WEST BENGAL

FOR THE YEAR - 1997

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I N T R O D U C T I O N

1. 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 21^0 31' 14" North latitudes and 85^0 45' 20" and 98^0 53' East longititudes. The geographical area of the State is about 87, 853 Sq.Km. Flood season in State s 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	=	37,600 Sq.Km
4. Area already protected	=	26,500 " "

RIVER BASINS :-

1.1 The State can be demarcated into three district drainage basins, coming under the Ganga, Brahmaputra ~~xxx~~ and Subarnarekha System ~~and~~ respectively. The afore stated main basins in turn can be divided into Sub-basins having individual catchments of their own. The area wise 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 northen regions of the State, the rivers within the Brahmaptura system consists of a total area of 14,208 Km^2 the main rivers being Sankosh, Raidak, Torsa, Kaljani, Jaldhaka, Teesta.

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1.2.2. GANGA BASIN:- 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 throwing through the narrow Central waist line of the present shape of this State had been an active Delta under.

The Ganga system comprise 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 as under :-

Serial No.	Name of river Sub-Basin.	Catchment area in KM^2
A.	Mahananda	9460
B.	Punarbhaba	730
C.	Atrai	910
D.	Bagla Barsloi	730
E.	Dwarka-Brahmani	2500
F.	Bhagirathi-Hooghly	1170
G.	Jalangi	5344
H.	Mayurakshi	2720
I.	Ajoy	2490
J.	Keri-Gangur-Ghea	1302
K.	Churni	800
L.	Damodar	5250
M.	Dwarkeswar	4430
N.	24-Parganas(South & North) and Calcutta Port Drainage Basin.	4330
O.	Kangsabati	8369
P.	Silabati	3952
Q.	Rupnarayan	2548
R.	Bidhan	820
S.	Rusulpur	1130
T.	Haldi	980
U.	Tidal Zone (Sundarbans Areas)	11320

The different tributaries of these rivers are listed below :-

A.	Sankosh	-	Chiklajhore
B.	Torsa	-	Raidak-I, Raidak-II, Turturi.
C.	Torsa	-	Kaljani, Sil-Torsa, Char, Torsa, Dolong, Sanjai, Chargharia, Goram, Dina, Pana, Jainti, Gabur, Basra.
D.	Jaldhaka	-	Mujnai, Murti, Diana, Sutanga, Dolong, Dharala, Ghatia, Kumlar Gilandi, Buduya.
E.	Teesta	-	Great Rangeet, Raman, Rangro, Lish, Ghish, Chel, Mal, Neora, Karali.

Brief Description of the above rivers :-

A. Sankosh :- It is the eastern most 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 out falls into Brahmaputra in Bangladesh by the name Gandachar. The river has its origin in Bhutan.

B. Raidak :- Originate in Mt. Akungchu at an altitude of 4000 M of Bhutan. The river bifurcate into two channels at Bhutanghat, close to Indo Bhutan border. One of the branches, namely Raidak-I joints the unite stream of Torsa and Kaljani, while the Raidak-II is joined by Sankosh and outfalls into Brahmaputra to Bangladesh by the name Gangachar.

C. Torsa :- The river Torsa in Chumbi Valley of southern hill at an altitude of 7065M. It flows through Tibet, Bhutan, West Bengal and Bangladesh. Below Hasimara Bridge(on NH 34) it bifurcate into two channels. viz. Sil Torsa and Char Torsa. They reunite at Datlakhwa forest. The river passes by the Coochbehar town and is joined by Kaljani river 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 and Sub-mountaineous regions, if finally flows into Dharals 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.

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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		- Halangi, Silamari, Bhairab, Suta.
8.	Mayurakshi		- Mayurakshi, Babla, Noon Beel Shiddheswari, Kuiya, Bakreswar, Kopai, Sal, Monikarnia, Laoki, Kana Mor, Gambhira.
9.	Ajoy		- Ajoy, Hinglow, Kungor.
10.	Khari-Gangur-Ghea		- Khari, Brahmani, Kabks, Bangour, Ghea, Behula, Kara
11.	Churni		- Churni.
12.	Damodar		- Damodar, Barakar, Sali.
13.	Dwarakeswar		- Gandheswari, Arkasha, Barai, Dwarkeswari.
14.	Rupnarayan		- Mundeswari, Dwarkeswar, Gandheswari, Barai, Damoda Tarjuli, Sankari, Silabati Joynanda, Kibai, Parang, Kanki.
15.	Haldi		- Haldi, Kangsabati, Kumari, Bhairab, Banki, Tarafeni, Kaliaghai, Bagdrai, Chand Kapaleswari
16.	Rasulpur		- Rasulpur, Dichban
17.	Tidal Rivers		- Tolly's Nullah, Keoropukur Ichamati, Raimongal, Kultiganga, Una, Kalindi, Hari, Banga, Gosaba, Metia Liali, Thakuran Raidighi, Saptamukhi, Muri Ganga.

A brief note on the above Sub-Basins

)Mahananda - The river Mahananda originate from Patlajhora near Kurseang town. It bifurcates into two channels, Viz. Fulahar Branch which flows throuc Bihar and Bansloi Branch which 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 Godagarighat just downstream, of the point where Ganga leaves the boundary of West Bengal.

)Atrai :- Punarbhaba- Some rivers like Sahu, Nim, Talma, Chani, Panga originate from the highlands in the district of Jalpaiguri. They gradually meet together afterwards, the combined stream assumes the same Karatowa. It then enters Bangladesh where it assumes the name Atrai and bifurcates into two channels viz. Deepa and Atrai.

The Question channel i.e. Atrai re-enters West Bengal in Kumarganj P.W. of West Dinajpur district. Covering some 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 ~~West Bengal~~ 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.

Nagar-Kulik Gamari Chimati Tangon-Jalangi

(3) 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. Theyultimately outfalls into Mahananda..

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

Tangon is a tributory of 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 itsorigin in the North Bihar, flowing across the plains of Purnea district, it enters Malda and outfalls into Mahananda.

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(4) Pagla-Bansloi-Brahmani :- These rivers rise in 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 when it receives water from Padma. The river ends its journey by finally outfalling into Hooghly area, Nabadwip town. In its lower stage of journey it is also known as Kharda.

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

(6) Ichamati-Churni :- River Mathabhanga rises near the mouth of the Jalangi on the Padma. It is not an important river in this State as it flows mainly in Bangladesh. It flows only a few Kms. within Nadia district. At this stage, the river bifurcates into two channels, the eastern branch, i.e. Churni runs a few Kms 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 lives on wash-outs by tidal flows.

(7) Bhagirathi-Hooghly :- Bhagirathi or Hooghly is the main river in the State. It is in fact the main artery of flow. Before the 12th century, the Ganga has 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 down stream due to the run off and outflow 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-Bahla :- 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 Bijol Beel of Murshidabad district. Bahla takes off from the Beel and drains into Bhagirathi.

(9) Ajoy :- It rises in the hills near Deoghar in Bihar. The principal tributaries of this river areas Patro, Janiti, Barna, Kunoor and Hinglow.

(10) Damodar :- It rises in the Palamoun hills in Bihar. The river bifurcates into two channels at Beguahane. The main flow passes through [illegible]

(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 or Palaspai Khal, it ultimately outfalls into Hooghly. The river is tidal throughout its entire course.

Dwarakeswar rises from the highlands of Purulia district. River Gangeswari rising from Bankura district meet Dwarakeswar near Bankura town receiving waters of others 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 treversing through Midnapore district, it meets Dwarkeswar.

(12) Kangsabati-Kalighai-Haldi :- River Kangsabati rising in Purulia district is joined by Kumari in Bankura district. Further down it is joined by the combined stream of Bhairab Banki and Trafeni rivers and thereafter flows on through the Midnapore district. After a tortous Palaspai Khal out falls 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 Hooghly river popularly known as Sundarbans and form an intricate network with a number of criss-cross into connection channels, thus dividing the land spill channels of Ganga, then upland supply running dry, during winter months. But gradually their offtakes from Ganga have deteriorates and in some cases being out-off from the river. New 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 thick area, starting from Hooghly river successively the Bartal of Muriganga or Channel Creek, Saptamukhi Thakuran, Matla, Gosaba, Muriganga, Raimongal. etc.

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

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1.2.3 SUBARNAREKHA BASIN :-

The river Subarnarekha, though it has every small catchment within this State has got separate entity as it direct falls into the Bay of Bengal. It has its origin in the hills of Chotonagpur Range at an elevation of 609M. 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 Khurkai above Chandil in Bihar, Kakhai in Bihar and Orissa and belongs 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 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 homgeneous from the materological 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 susceptable heavy rains both in respect of amount as well as in frequency of occurance. 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, September and July in that order.

On the basis of rainfall distributed, the State can be sub-divided into two break zones.

i) The Himalayan and Sub-Himalayan Region.

ii) The Gangetic Plains.

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The Himalayan and Sub-Himalayan regions comprising districts of Darjeeling, Jalpaiguri, Cooch-Behar and Northern Part of Islampur Sub-Divisionof West Dinajpur district of high intensity of Rainfallfrom 200 cm.to over 400 cm about 80% of which is found to occur during the monsoon season fromJune to September. On the average Darjeeling, Cooch-Behar and Jalpaiguri get 114.112 & 110 rainy days respectively in a year. The monsoon generally follow a northernly tract to ultimately break up against Eastern Himalayan causing very heavy rainfall and conditions, it shifts northwards to the Himalayan foot hills.It has been found that a precipitation to the tune of 200 or 300 mm in 2½ hours is not unusual while in more than forty occasions or rainfall of 250mm and above have been registered during 1891-1965.

The Gangetic plain which constitute 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 1400mm.

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 1400mm and 1650mm.

SECTOR :III Comprising Howrah, Eastern portion of West Dinajpur South 24-Parganas and Midnapur District which register and average annual rainfal between 1650mm and 1900mm.

Such regional averations in the precipiption pattern causes flood conditions from time to time.

The rainfall data as collected from Indian Metrological Department for the districts is shown in Annexures.

Report on flood & erosion in
West Bengal during the year 1997

The main rainfall season in this state is the South West monsoon season during which the entire land(excepting the extreme north, the extreme north east and extreme south) gets 75% of the annual rainfall. The gangatic planes of West Bengal also gets 78% of its annual rainfall during the period from June to September. This year the onset of monsoon over West Bengal was spread between middle of June to last week of September.Moreover the damages due to flood & cyclonic storm mainly concentrated in the district of Midnapore, 24-Parganas North & South and adjoining area of Hooghly river. Apart from that Malda district also faced continuous erosion problem along the left bank of river Ganga.North Bengal also suffered some extent.Due to heavy rainfall in different spell North Bengal rivers crossed Danger Level in many places and also crossed extreme danger level in places. The high flood passing through these rivers caused extensive damages at various vulnerable embankments spurs, structures, & other protective works which are given below.

Due to heavy rainfall on 30.6.97 water level rises on all the rivers of North Bengal, as a result protection works & pitching works in different places have been seriously damaged.On 3. 7. 97. Balabhut,Dhupguri, embankment on Left Bank of river Kaljani & Gadadhar Embankment on Left Bank of river Gadadhar severely damaged Protective measures were taken up. Due to heavy rainfall on 7.7.97 & 11. 7. 97.Tikomia embankment of 500m length launched at the Left Bank of river Mansai. Kaljani & Dakshin Ambari embankment at the Right Bank of river Kaljani damaged severely from 60M to 110M. Banaguri embankment for a length of about 125M launched & damaged. Tikimia embankment for a length of 100M totally launched on 14.7.97 river Atrai, Punarbhava & Tangon of South Dinajpur district were flowing above danger level. As a result 5 breaches occured at Rampura Chandra embankment along river Punarbhava which inundated an a rea approx. 7 Sq.Km in P.S.Tapan of South Dinajpur District. Dakshin Ambari embankment on right bank of river Kaljani in P.S. Kutowali has severely damaged from 190M to 300M. Due to heavy rainfall at Cooch-Behar on 11. 8. 97(193.20mm) 150M boulder apron launched at Banaguri embankment under Mathabhanga P.S. on river Mansai. Severe bank erosion were being observed on many places at Cooch Behar & Jalpaiguri district. 85 Nos. porcupines washed away out of 182 laid as a Protective measure at Joypur in river Jayanti in P.S.Alipurduar, under Cooch-Behar & Jalpaiguri District.6 porcupines stands at Belakopa embankment on river Raidak-II washed away. 30M armoured embankment & 30M unarmoured portion of embankment at Bairati Garjat Chumda embankment in left bank of river Mansai washed away by flood of 13. 8. 97. Due to heavy rainfall Right Bank of river Turtui at Lokenathpur eroded about 250M.Heavy erosion on the left bank of Kaljani

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& washed away at Poddarpara on river Cheko under Alipurduar. Bank erosion about 30M adjoining RLI pump house at stake. Emergent measure have been taken up to tackle the situation. Chengmari embankment from 470M to 565M Left Bank of river Liana effected seriously due to flood.

River Ganga eroded the Left Bank at Gorepara about a length of 500M and width of 45M(A.V.) in P.s. Kaliachak in the district of Malda. The marginal embankment at Gorepara also threatened. In Murshidabad district the River Ganga/Padma was eroding at Alipur at the upstream of CAIP work at Akhariganj. River Ganga at Farakka & Manikchak crosses Extreme Danger Level & Danger Level in many times as shown in the annexure. River Ganga at the upstream of Spur No. 24 in Gorepara Durgaran-tala affected a length of about 500M. Mahananda in Englishbazar crosses Extreme Danger Level on 16. 7. 97 & Danger Level in many times as shown in annexure. Fulhar at Toljana also crosses Danger Level on 16.7.97.

The District Midnapore, South & North 24-Parganas & adjoining area of Hooghly river experienced floods & cyclone in four spells from June to August, 1997. In the first spell heavy rain occured in Bankura & Midnapore district from 26. 6. 97 to 29.6.97. As a result water level of river Cossye in Midnapore district rises quickly & crossed Extreme Danger Level at Mohanpur on 26. 6. 97 at 07.hours & at Panskura on 29. 6. 97 one breach occured at Srikanta-Kalahanda in P.S.Tamluk at the Left Bank of river Kosye & another at mouza Kamalpur in P.S.Debra leading to inundation of an area of 40 Sq.KM & 50 Sq.KM in P.S. Tamluk & Debra respectively. In the second spell heavy rainfall concentrated at the Upper Catchment of Kangsabati reservoir in Purulia & Bankura District on 23. 7. 97 varying from 127.40m.m. to 237.00m.m. and rises the reservoir level rapidly which necessitated to release of water down the spillway to the maximum of 1,19,646 cusec at 16.00 hours on 23.7.97 & continued for 5 hours & there after gradually reduced to NIL from 18.00 hours on 25. 7. 97. As a result, the water level of river Cossye in the lower part at Mohanpur in Midnapur district crosses Extreme Danger Level at 16 hours on 24.7.97 (27.52M) and the corresponding discharge down the river was recorded as 1,73,950 cusecs. Which causes number of breaches, Gloges, slips, etc. at various vulnerable places of embankments of Cossye & its branches & inundated further 70 Sq.KM in P.S. Debra & 40 Sq.KM in P.S.Panskura. Within a short period another spell (i.e. on 5.8. & 6.8.97), another spell (the spell) of rainfall with Cyclonic wind occured, as a result the old inundated area aggrevated further and an area of 30.Sq.Km in P.S.Kaspur & 130 Sq.Km in P.S Panskura- 1 & II unto Kolaghat was under water, Breaches, Gloges & slips occured in various vulnerable places in L.C.embankment. Right embankment of Mukdari Khal, Right & Left Embankment of Tapa Drainage Khal, Kherichak & Nowamanik Khal etc. In the fourth spell during the period from 19.8.97 to 21.8.97 a deep depression in the Bay of Bengal occured at the time of high tide level

at Uttar Balabhut & 50M embankment damaged at the left bank of river Kasko. Protective work of round sausage have been damaged of Purima Kotal which causes severe damages in the coastal area of Midnapore, South & North 24-Parganas district. The height of the wave was so high that it crossed over the top of guard wall by 1.50M and flooded the coastal area of Digha. The sea guard wall & concrete path way were also badly damaged. Moreover the high tide water level causes several nos of breaches ghoges, slips etc. in the vulnerable zones of flood embankment of river Rupnarayan, Haldia, Hooghly river etc. The major part of the Sundarban embankment of South & North 24-Parganas affected badly. At many ~~times~~ places the embankment breaches & washed away causing saline inundation in a vast area.

In a short the flood of 1997 causes inundation, in a vast area of Midnapore, South & North-24-Parganas,Hooghly, South Dinajpur districts & damages Irrigation and Waterways Department embankments, structures in the form of breaches, ghoges, slips etc. which involves a huge expenditure to restore the assets to its pre flood stage.

ANNEXURE-A

Rainfall in West Bengal during 1997 (in mm)

Name of Districts	From 1.1.97 to 31. 5. 97		From 1.6.97 to 15. 10. 97		From 1.1.97 to 15. 10. 97		Percentage Departure on 15.10.97	Remarks
	Actual	Normal	Actual	Normal	Actual	Normal		
Cooch-Behar	417.3	528.3	2198.6	2539.9	2615.9	3068.2		
Jalpaiguri	386.1	524.6	2449.6	2596.4	2835.7	3121.0		
Darjeeling	303.4	365.4	2205.3	2545.6	2508.7	2911.0		
M a l d a	186.7	205.9	1447.2	1287.2	1633.9	1493.1		
Balurghat (S.Dinajpur) Raiganj (N.Dinajpur)	88.6	209.3	1390.4	1237.4	1479.0	1446.7		
Murshidabad	262.4	204.4	1283.4	1114.0	1545.8	1318.4		
Birbhum	217.8	159.5	1626.7	1033.5	1844.5	1193.0		
N a d i a	426.0	264.3	1515.2	1060.7	1941.2	1325.0		
Burdwan	225.6	199.1	1175.0	1108.6	1400.6	1307.7		
Bankura	195.3	187.0	1357.8	1070.9	1533.1	1257.9		
Purulia	149.0	118.8	1516.5	1167.9	1665.5	1286.7		
Midnapur	372.1	219.7	1321.5	1210.7	1693.6	1430.4		
Hooghly	183.8	205.1	989.9	1201.4	1178.7	1406.5		
Howrah	321.1	280.9	915.4	1307.7	1236.5	1588.6		
24-Parganas (North)	370.0	240.1	1487.8	1265.6	1857.8	1505.7		
24-Parganas (South)	343.2	241.4	1376-5	1374.6	1719.7	1616.0		

ANNEXURE-II

Table showing Rainfall in mm.at different Station during different critical periods during June, July, August, 1997.

Serial No.	Station.	27.6.97	28.6.97	29.6.97	22.7.97	23.7.97	24.7.97	6.8.97	Remarks
1.	Simulia	17.6	33.2	139.2	23.2	127.4	---	101.0	Upper Catchment Kangsabati Dam in Purulia and Bankura District
2.	Rangogora	16.4	205.0	58.8	4.8	--	---	83.4	
3.	Kharidwara	31.7	230.0	61.4	80.8	237.0	---	57.4	
4.	Tusuma	41.6	174.4	46.4	91.0	140.6	---	86.8	
5.	Bandhu	N.A.	NA.	NA.	42.0	104.0	11.8	77.0	
6.	Extn.of Bandhu	N.A.	N.A.	N.A.	85.0	195.0	25.0	40.0	
7.	Tatko	N.A.	NA.	N.A.	N.A.	42.0	30.0	22.0	
8.	Purulia	N.A.	N.A.	N.A.	29.0	134.0	22.4	72.0	
9.	Parga	N.A.	N.A.	N.A.	15.0	150.0	9.0	120.4	
10.	Saharajore	N.A.	N.A.	N.A.	N.A.	86.0	47.4	142.0	
11.	Kumari	N.A.	NA.	N.A.	N.A.	13.0	35.0	77.0	
12.	Kangsabati Dam	39.6	206.0	206.00	5.80	65.0	65.20	37.4	
13.	Binpur	42.6	264.4	13.6	0.20	1.4	49.0	85.80	Lower Catchment of Kangsabati River in Midnapur District.
14.	Mohanpur	41.8	151.8	9.8	12.8	9.8	10.60	114.4	
15.	Midnapur	52.8	173.0	9.4	25.20	27.20	6.20	82.60	

ANNEXURE - III

TABLE SHOWING THE RELEASE FROM KANGSABATI DAM FROM 19.07.97 TO 25.07.97 & FROM 06.08.97 TO 07.08.97.

CONSERVATION LEVEL = 435.02 FEET

Date	Time	Reservoir Level (in ft.)	Canal (in cusec)	Spillway (in cusec)	Total (in cusecs)
19.07.97	06.00	434.60	4460	--	4,460
20.07.97	06.00	435.20	5852	--	5,852
21.07.97	06.00	435.50	6815	--	6,815
	17.00	435.70	--	10,036	10,036
22.07.97	06.00	435.70	5530	10,872	16,402
	17.00	436.45	5530	16,270	21,800
	19.30	436.60	5330	26,215	31,545
	22.30	437.40	4410	50,558	54,968
23.07.97	06.00	438.40	4410	50,843	55,253
	11.00	439.10	4410	60,327	64,737
	11.30	439.20	4410	91,382	95,792
	16.00	439.35	4410	1,19,464	1,23,874
24.07.97	00.00	439.00	4410	1,05.000	1,09.410
	05.00	438.00	4410	1,03,130	1,07.540
	06.00	438.00	4410	89,206	93,616
	09.00	437.60	4410	69,667	74,077
	17.00	436.60	4410	50,000	54,410
	19.00	436.40	4410	30,000	34,410
25.07.97	08.00	435.50	4410	20,549	24,959.
	12.00	435.40	4410	10,729	15,139
	18.00	435.40	5398	N I L	5,398
06.08.97	13.00	436.90	4783	34,624	39,407
07.08.97	06.00	436.80	4746	34,721	39,467

Important Reservoir Levels & Discharges data

during flood season in 1997.

Me of servoir/	Conservation Level in (M)	Date.	Time.	Reservoir Level in(M)	Discharge in Cumecs	Remarks
NCHET	124.968	3.7.97	6.00	124.36	229.75	
PANCHET		4.7.97	6.00	124.57	322.85	
		13.7.97	6.00	124.70	287.18	
		14.7.97	6.00	124.79	343.46	
		16.7.97	6.00	124.53	343.00	
		18.7.97	6.00	124.80	187.13	
		19.7.97	6.00	125.17	184.82	Above Conservation level
		20.7.97	6.00	124.13	864.56	
		24.7.97	6.00	126.54	342.19	-do-
		25.7.97	6.00	126.53	703.49	-do-
		26.7.97	6.00	127.17	941.80	-do-
		27.7.97	6.00	126.35	1103.46	-do-
		28.7.97	6.00	125.27	1128.70	-do-
		5.8.97	6.00	125.27	483.45	-do-
		6.8.97	6.00	125.09	561.51	-do-
		7.8.97	6.00	127.34	910.19	-do-
		8.8.97	6.00	128.65	1389.37	-do-
		9.8.97	6.00	128.26	1571.41	-do-
		10.8.97	6.00	127.31	1549.29	-do-
		11.8.97	6.00	126.19	1342.12	-do-
		12.8.97	6.00	125.07	1267.20	-do-
		13.8.97	6.00	125.42	861.09	-do-
		14.8.97	6.00	125.62	851.71	-do-
		15.8.97	6.00	126.30	848.81	-do-
		16.8.97	6.00	127.19	859.00	-do-
		17.8.97	6.00	127.20	852.98	-do-
		18.8.97	6.00	126.82	843.95	-do-
		19.8.97	6.00	126.46	854.72	-do-
		20.8.97	6.00	126.14	860.97	-do-
		21.8.97	6.00	125.85	833.07	-do-
		22.8.97	6.00	126.38	844.93	-do-
		23.8.97	6.00	127.04	813.03	-do-
		24.8.97	6.00	126.73	1220.53	-do-
		25.8.97	6.00	126.21	901.73	-do-
		26.8.97	6.00	126.15	514.04	-do-
		27.8.97	6.00	126.06	441.31	-do-
		28.8.97	6.00	125.93	413.17	-do-
		29.8.97	6.00	126.28	391.75	-do-
		31.8.97	6.00	128.70	832.37	-do-
		1.9.97	6.00	128.73	987.78	-do-
		2.9.97	6.00	128.50	965.77	-do-
		3.9.97	6.00	127.88	981.90	-do-
		4.9.97	6.00	127.34	705.34	-do-
		5.9.97	6.00	126.75	532.22	-do-

contd....p/2

Important Reservoir Levels & Discharges

Data during flood season in 1 9 9 7.

Name of Reservoir/ Barrage	Conservation Level in (M)	Date.	Time	Reservoir Level in (M)	Discharge in Cumecs.	Remarks
PANCHET :	124.965	6.9.97	6.00	126.57	532.80	Above Conservation Level
PANCHET		7.9.97	6.00	126.58	558.27	-do-
		8.9.97	6.00	126.36	551.79	-do-
		9.9.97	6.00	126.09	551.90	-do-
		10.9.97	6.00	127.08	564.99	-do-
		11.9.97	6.00	127.04	539.06	-do-
		12.9.97	6.00	126.74	562.44	-do-
		13.9.97	6.00	126.50	561.51	-do-
		14.9.97	6.00	126.43	553.06	-do-
		15.9.97	6.00	126.42	544.03	-do-
		16.9.97	6.00	126.46	534.19	-do-
		1 .9.97	6.00	127.05	484.85	-do-
		19.9.97	6.00	127.03	495.05	-do-
		20.9.97	6.00	127.22	494.93	-do-
		21.9.97	6.00	127.32	517.20	-do-
		22.9.97	6.00	127.16	512.07	-do-
		23.9.97	6.00	127.00	510.60	-do-
		24.9.97	6.00	126.74	526.20	-do-
		25.9.97	6.00	126.50	381.45	-do-
		26.9.97	6.00	126.48	339.10	-do-
		27.9.97	6.00	126.47	322.97	-do-
		28.9.97	6.00	126.34	330.72	-do-
		29.9.97	6.00	126.09	320.77	-do-
		30.9.97	6.00	125.00	300.72	-do-
		1.10.97	6.00	125.76	237.85	-do-
		2.10.97	6.00	125.75	144.98	-do-
		3.10.97	6.00	125.85	122.29	-do-
		4.10.97	6.00	125.93	131.32	-do-
		5.10.97	6.00	125.99	115.22	-do-
		6.10.97	6.00	126.13	82.22	-do-
		7.10.97	6.00	126.16	122.28	-do-
		8.10.97	6.00	126.24	153.32	-do-
		9.10.97	6.00	126.41	31.85	-do-
		10.10.97	6.00	126.64	128.19	-do-
		11.10.97	6.00	126.81	102.48	-do-
		12.10.97	6.00	126.47	78.98	-do-
		13.10.97	6.00	126.90	149.73	-do-
		14.10.97	6.00	126.92	176.25	-do-
		15.10.97	6.00	126.80	154.25	-do-

contd...p/2

ANNEXURE - E

Important Reservoir Levels & Discharge data during flood season in 1997.

e of rvoir/ rage.	Conservation Level in (M)	Date.	Time	Reservoir Level in (M)	Discharge in Cumec.	Remarks.
ANJORE	121.310	24.7.97	6.00	119.024	NIL	
MASSONJORE		25.7.97	6.00	119.177	NIL	
		26.7.97	6.00	119.283	NIL	
		27.7.97	6.00	119.344	NIL	
		28.7.97	6.00	119.786	NIL	
		29.7.97	6.00	119.756	157.17	
		30.7.97	6.00	119.634	99.60	
		31.7.97	6.00	119.634	37.75	
		12.8.97	6.00	119.98	2.38	
		13.8.97	6.00	120.091	NIL	
		14.8.97	6.00	120.137	152.70	
		15.8.97	6.00	120.00	309.76	
		23.8.97	6.00	120.061	4.34	
		24.8.97	6.00	120.152	3.44	
		25.8.97	6.00	120.122	84.11	
		31.8.97	6.00	120.259	202.40	
		4.9.97	6.00	120.350	46.67	
		5.9.97	6.00	120.442	N I L	
		19.9.97	6.00	120.655	4.13	
		21.9.97	6.00	120.899	19.38	
		25.9.97	6.00	120.929	292.21	
		26.9.97	6.00	120.945	82.95	
		27.9.97	6.00	120.975	67.07	
		28.9.97	6.00	121.036	4.11	
		29.9.97	6.00	121.021	43.64	
		30.9.97	6.00	121.036	36.63	
		2.10.97	6.00	121.067	0.77	
		4.10.97	6.00	121.112	N I L	
		5.10.97	6.00	121.143	N I L	
		6.10.97	6.00	121.173	N I L	
		7.10.97	6.00	121.188	N I L	
		10.10.97	6.00	121.219	9.21	
		12.10.97	6.00	121.234	52.69	
		15.10.97	6.00	121.219	N I L.	

Important Reservoir Levels & Discharge data during flood Season in 1 9 9 7.

me of servoir/ rrage.	Conservation Level in(M)	Date.	Time	Reservoir Level in (M)	Discharge in Cumecs	Remarks.
ITHON	146.304	14.7.97	6.00	145.89	144.91	Below Conservation level(C.L)
MAITHON		15.7.97	6.00	146.35	142.29	Above C.L.
		16.7.97	6.00	146.48	137.09	-do-
		17.7.97	6.00	146.59	139.92	-do-
		18.7.97	6.00	146.69	143.39	-do-
		19.7.97	6.00	146.80	230.56	-do-
		20.7.97	6.00	146.35	550.32	-do-
		24.7.97	6.00	146.20	848.58	Below C.L.
		25.7.97	6.00	145.89	874.56	-do-
		26.7.97	6.00	145.31	707.86	-do-
		27.7.97	6.00	144.58	546.92	-do-
		28.7.97	6.00	144.13	547.91	-do-
		5.8.97	6.00	144.87	170.67	-do-
		6.8.97	6.00	145.26	176.51	-do-
		7.8.97	6.00	146.29	164.86	-do-
		8.8.97	6.00	146.61	170.74	above C.L.
		9.8.97	6.00	146.68	143.85	-do-
		10.8.97	6.00	146.67	169.52	-do-
		11.8.97	6.00	146.74	160.54	-do-
		12.8.97	6.00	147.35	214.21	-do-
		13.8.97	6.00	147.43	776.00	-do-
		14.8.97	6.00	146.66	973.84	-do-
		15.8.97	6.00	146.12	922.12	Below C.L.
		16.8.97	6.00	145.79	745.64	-do-
		17.8.97	6.00	145.23	685.16	-do-
		18.8.97	6.00	144.87	651.97	-do-
		31.8.97	6.00	145.98	172.47	Above C.L.
		1. 9.97	6.00	147.26	166.66	-do-
		2. 9.97	6.00	147.39	163.54	-do-
		3.9. 97	6.00	147.47	165.34	-do-
		4.9. 97	6.00	147.43	165.66	-do-
		5.9.97	6.00	147.34	162.10	-do-
		6.9.97	6.00	147.24	155.74	-do-
		7.9.97	6.00	147.33	168.82	-do-
		8.9.97	6.00	147.59	168.80	-do-
		9.9.97	6.00	148.43	276.04	-do-
		10.9.97	6.00	148.40	422.07	-do-
		11.9.97	6.00	148.19	428.32	-do-
		12.9.97	6.00	148.06	306.15	-do-
		13.9.97	6.00	148.16	278.65	-do-

Name of Reservoir/ Barrage	Conservation Level in (M)	Date.	Time	Reservoir Level in (M)	Discharge in Cumecs.	Remarks.
1.	2.	3.	4.	5.	6.	7.
MAITHON	146.304	14.9.97	6.00	148.41	262.49	Above C.L.
		15.9.97	6.00	148.45	261.74	-do-
MAITHON		16.9.97	6.00	148.51	298.16	-do-
		18.9.97	6.00	148.29	362.54	-do-
		19.9.97	6.00	148.25	307.84	-do-
		20.9.97	6.00	148.29	260.94	-do-
		21.9.97	6.00	148.23	259.77	-do-
		22.9.97	6.00	148.09	260.24	-do-
		23.9.97	6.00	148.36	208.70	-do-
		24.9.97	6.00	148.04	220.62	-do-
		25.9.97	6.00	147.76	259.02	-do-
		26.9.97	6.00	147.89	264.24	-do-
		27.9.97	6.00	147.82	264.12	-do-
		28.9.97	6.00	147.77	114.00	-do-
		29.9.97	6.00	147.70	157.80	-do-
		30.9.97	6.00	147.65	140.60	-do-
		1.10.97	6.00	147.84	133.61	-do-
		2.10.97	6.00	147.99	78.48	-do-
		3.10.97	6.00	147.96	77.77	-do-
		4.10.97	6.00	148.05	83.58	-do-
		5.10.97	6.00	148.00	83.35	-do-
		6.10.97	6.00	147.93	45.29	-do-
		7.10.97	6.00	148.11	61.65	-do-
		8.10.97	6.00	148.12	60.32	-do-
		9.10.97	6.00	148.16	32.09	-do-
		10.10.97	6.00	148.26	60.79	-do-
		11.10.97	6.0	148.24	82.69	-do-
		12.10.97	6.00	147.98	Not available	-do-
		13.10.97	6.00	148.13	99.97	-do-
		14.10.97	6.00	148.00	71.13	-do-
		15.10.97	6.00	148.04	66.98	-do-

contd....p

Important Barrage Levels & Discharge/ data during flood season in 1 9 9 7.

Name of Barrage.	Date	Time.	Barrage Level in (M)	Discharge in Cumec	Remarks
LURGAPUR :-	29.6.97	6.00	64.465	83.35	
	30.6.97	6.00	64.465	101.14	
	1. 7. 97	6.00	64.465	295.97	
	2. 7. 97	6.00	64.465	344.28	
	4. 7. 97	6.00	64.465	353.03	
	5.7.97	6.00	64.465	497.77	
	13.7. 97	6.00	64.465	599.68	
	20.7.97	6.00	64.313	949.05	
	21.7. 97	6.00	64.313	1,671.44	
	22.7.97	6.00	64.313	1,500.46	
	23.7. 97	6.00	64.313	1,550.91	
	24.7. 97	6.00	64.313	1,528 65	
	25.7. 97	6.00	64.313	1,701.33	
	26.7. 97	6.00	64.313	1,942.54	
	27.7.97	6.00	64.313	1,806.10	
	28.7. 97	6.00	64.313	1,823.41	
	29.7. 97	6.00	64.313	1,785.93	
	30.7. 97	6.00	64.313	1,315.23	
	31.7. 97	6.00	64.313	1,314.75	
	1.8. 97	6.00	64.313	1,351.69	
	2.8. 97	6.00	64.313	1,627.17	
	3.8. 97	6.00	64,313	1,806.10	
	7.8. 97	6.00	64.313	1,239.16	
	9.8. 97	6.00	64.313	1,884.89	
	10.8. 97	6.00	64.313	1,910.42	
	11.8. 97	6.00	64.313	1,775.25	
	13.8. 97	6.00	64.313	1,796.73	
	14.8.97	6.00	64.313	2,236.67	
	15.8.97	6.00	64.313	2,283.92	
	16.8.97	6.00	64.313	2,346.38	
	17.8.97	6.00	64.313	1,879.63	
	19.8.97	6.00	64.313	1,815.38	
	20.8.97	6.00	64.313	1,624.76	
	21.8.97	6.00	64.313	1,432.72	
	22.8.97	6.00	64.313	1,161.17	
	23.8.97	6.00	64.313	1,103.70	
	24.8.97	6.00	64.313	1,283.16	
	25.8.97	6.00	64.313	1,531.24	

ANNEXURE -V.

Important Barrage Levels & Discharge data during flood season in 1 9 9 7.

Name of Barrage.	Date.	Time	Barrage Level in (M)	Discharge in Cumec.	Remarks
DURGAPUR :-	1. 9. 97	6.00	64.313	1204.31	
	3.9. 97	6.00	64.313	1310.73	
	4. 9. 97	6.00	64.313	1240.00	
	5. 9. 97	6.00	64.313	843.66	
	10. 9. 97	6.00	64.313	1211.05	
	11. 9. 97	6.00	64.313	1204.02	
	12. 9. 97	6.00	64.313	1169.56	
	13. 9. 97	6.00	64.313	1109.14	
	29. 9. 97	6.00	64.465	677.85	
	30. 9. 97	6.00	64.465	652.87	
	1. 10. 97	6.00	64.465	649.03	
	2. 10. 97	6.00	64.465	408.27	
	5. 10. 97	6.00	64.465	317.69	
	6. 10. 97	6.00	64.313	269.41	
	7. 10. 97	6.00	64.465	149.56	
	9. 10. 97	6.00	64.221	244.76	
	10. 10. 97	6.00	64.465	70.94	
	12. 10. 97	6.00	64.404	234.16	
	13. 10. 97	6.00	64.406	253.58	
	15. 10. 97	6.00	64.465	254.87	

contd....p/

Important Barrage Levels & Lischarge data during flood season in 1 9 9 7

Name of Barrage	Date.	Time.	Barrage Level in (M)	Discharge in Cumecs.	Remarks
TILPARA :-	16. 6. 97	6.00	60.929	N I L	
	17. 6. 97	6.00	60.867	N I L	
	14. 7. 97	6.00	59.131	N I L	
	23. 7. 97	6.00	61.691	578.88	
	25. 7. 97	6.00	61.570	88.49	
	26. 7. 97	6.00	61.630	41.58	
	27. 7. 97	6.00	61.661	38.30	
	28. 7. 97	6.00	61.636	13.31	
	29. 7. 97	6.00	61.[illegible]	128.81	
	30. 7. 97	6.00	62.453	--	
	31. 7. 97	6.00	61.937	90.67	
	1. 8. 97	6.00	62.332	150.98	
	2. 8. 97	6.00	62.301	166.65	
	3. 8. 97	6.00	62.027	102.73	
	4. 8. 97	6.00	63.392	117.52	
	5. 8. 97	6.00	62.000	202.20	
	6. 8. 97	6.00	61.996	244.08	
	7. 8. 97	6.00	62.240	137.14	
	8. 8. 97	6.00	62.332	97.10	
	9. 8. 97	6.00	62.179	62.92	
	10. 8. 97	6.00	62.271	32.00	
	13. 8. 97	6.00	61.874	119.93	
	14. 8. 97	6.00	61.722	174.05	
	15. 8. 97	6.00	61.874	318.71	
	16. 8. 97	6.00	61.844	327.43	
	17. 8. 97	6.00	61.844	298.54	
	18. 8. 97	6.00	61.991	267.70	
	19. 8. 97	6.00	61.935	198.42	
	20. 8. 97	6.00	61.600	108.67	
	21. 8. 97	6.00	62.210	8.50	
	26. 8. 97	6.00	62.545	61.57	
	29. 8. 97	6.00	62.[illegible]	43.69	
	31. 8. 97	6.00	61.[illegible]	355.13	
	1. 9. 97	6.00	61.722	338.16	
	2. 9. 97	6.00	61.661	484.83	
	3. 9. 97	6.00	61.630	238.20	
	4. 9. 97	6.00	61.966	39.94	
	5. 9. 97	6.00	62.027	16.04	

contd....P/2

Important Barrage Levels & Dishcarge
Data during flood season in 1 9 9 7.

NAME OF BARRAGE	Date.	Time	Barrage Level in (M)	Discharge in Cusec.	Remarks.
TILPARA :-	8. 9. 97	6.00	61.013	256.70	
	9. 9. 97	6.00	61.630	251.62	
	10. 9. 97	6.00	61.752	110.02	
	11. 9. 97	6.00	62.149	124.20	
	12. 9. 97	6.00	61.966	176.07	
	13. 9.97	6.00	61.013	161.35	
	14. 9. 97	6.00	62.080	131.59	
	15. 9. 97	6.00	61.722	194.50	
	16. 9. 97	6.00	61.722	201.02	
	18.9. 97	6.00	61.630	170.99	
	19. 9. 97	6.00	61.782	99.55	
	21. 9. 97	6.00	61.722	252.43	
	22. 9. 97	6.00	61.600	272.00	
	24. 9. 97	6.00	61.966	34.67	
	25. 9. 97	6.00	61.722	255.11	
	26. 9. 97	6.00	62.301	142.04	
	27. 09.97	6.00	61.752	270.65	
	28. 9. 97	6.00	62.301	57.66	
	29. 9. 97	6.00	62.119	76.21	
	30. 9. 97	6.00	62.240	48.54	
	1. 10. 97	6.00	62.404	38.48	
	3. 10. 97	6.00	62.519	19.83	
	4. 10. 97	6.00	62.130	36.42	
	5. 10. 97	6.00	60.606	30.70	
	6. 10. 97	6.00	62.545	28.33	
	7. 10. 97	6.00	62.484	28.33	
	8. 10. 97	6.00	62.575	14.08	
	11.10.97	6.00	62.789	47.11	
	13.10.97	6.00	61.905	72.83	
	14.10.97	6.00	61.935	36.24	
	15.10.97	6.00	61.013	49.35	

ANNEXURE-A

DISCHARGE DATAS OF RIVERS DURING
FLOOD SEASON IN 1 9 9 7

S.	River.	Gauge at	Warning Level	Date	Level(M)	Time	Remarks.
1	2	3	4	5	6	7	8
3.	Ganga	Manikchakghat (Malda)	D.L.24.69M	16.7.97	23.75	6.00	---
				17.7.97	23.81	"	---
			D.L.L.25.30M	21.7.97	23.81	"	---
				22.7.97	23.76	"	---
				28.7.97	23.53	"	---
				8.8.97	24.20	"	----
				11.8.97	24.70	"	above D.L.
				12.8.97	24.80	"	-do-
				13.8.97	24.92	"	-do-
				14.8.97	25.00	"	-do-
				17.8.97	25.07	"	-do-
				18.8.97	24.98	"	-do-
				19.8.97	24.95	"	-do-
				20.8.97	24.83	"	-do-
				21.8.97	24.77	"	-do-
				22.8.97	24.74	"	----
				26.8.97	24.10	"	--
				8.9.97	25.50	"	above DL
				9.9.97	25.35	"	-do-
				10.9.97	25.07	"	above DL
				11.9.97	24.62	"	----
				12.9.97	24.25	"	----
.	Ganga	Farakka (Murshidabad)	L.L.22.25	14.7.97	22.98	6.00hrs.	above DL
			D.F.L.23.77M	15.7.97	22.22	"	--
				17.7.97	22.36	"	above DL
				21.7.97	22.42	"	-do-
				22.7.97	22.40	"	-do-
				23.7.97	22.34	"	-do-
				28.7.97	22.10	"	-do-
				29.7.97	22.01	"	-----
				7. 8. 97	22.14	"	---
				8. 8. 97	22.56	"	above D.L.
				9.8.97	23.01	"	-do-
				11.8. 97	23.12	"	-do-
				12.8. 97	23.20	"	-do-
				13.8. 97	23.34	"	-do-
				14.8. 97	23.41	"	-do-

contd...p/

CONTINUED OF ANNEXURE -VI

Sl. No.	River.	Gauge at	Warning Level	Date.	Level(M)	Time	Remarks.
				17.8.97	23.48	6.00Hrs	above L.L.
				18.8.97	23.45	"	-do-
				19.8.97	23.38	"	-do-
				20.8.97	23.31	"	-do-
				21.8.97	23.23	"	-do-
				22.8.97	23.18	"	-do-
				23.8.97	23.12	"	-do-
				24.8.97	23.03	"	-do-
				26.8.97	22.60	"	-do-
				27.8.97	22.34	"	-do-
				28.8.97	22.11	"	-do-
				6.9.97	23.55	"	-do-
				8.9.97	23.72	"	-do-
				9.9.97	23.58	"	-do-
				10.9.97	23.34	"	-do-
				11.9.97	23.02	"	-do-
				12.9.97	22.68	"	-do-
				13.9.97	22.38	"	-do-
				14.9.97	22.22	"	-do-
				16.9.97	22.32	"	above D.L.
				17.9.97	22.50	"	-do-
				18.9.97	22.56	"	-do-
				19.9.97	22.62	"	-do-
				20.9.97	22.62	"	-do-
				21.9.97	22.59	"	-do-
				22.9.97	22.43	"	-do-
				24.9.97	22.16	"	———

ANNEXURE -VII

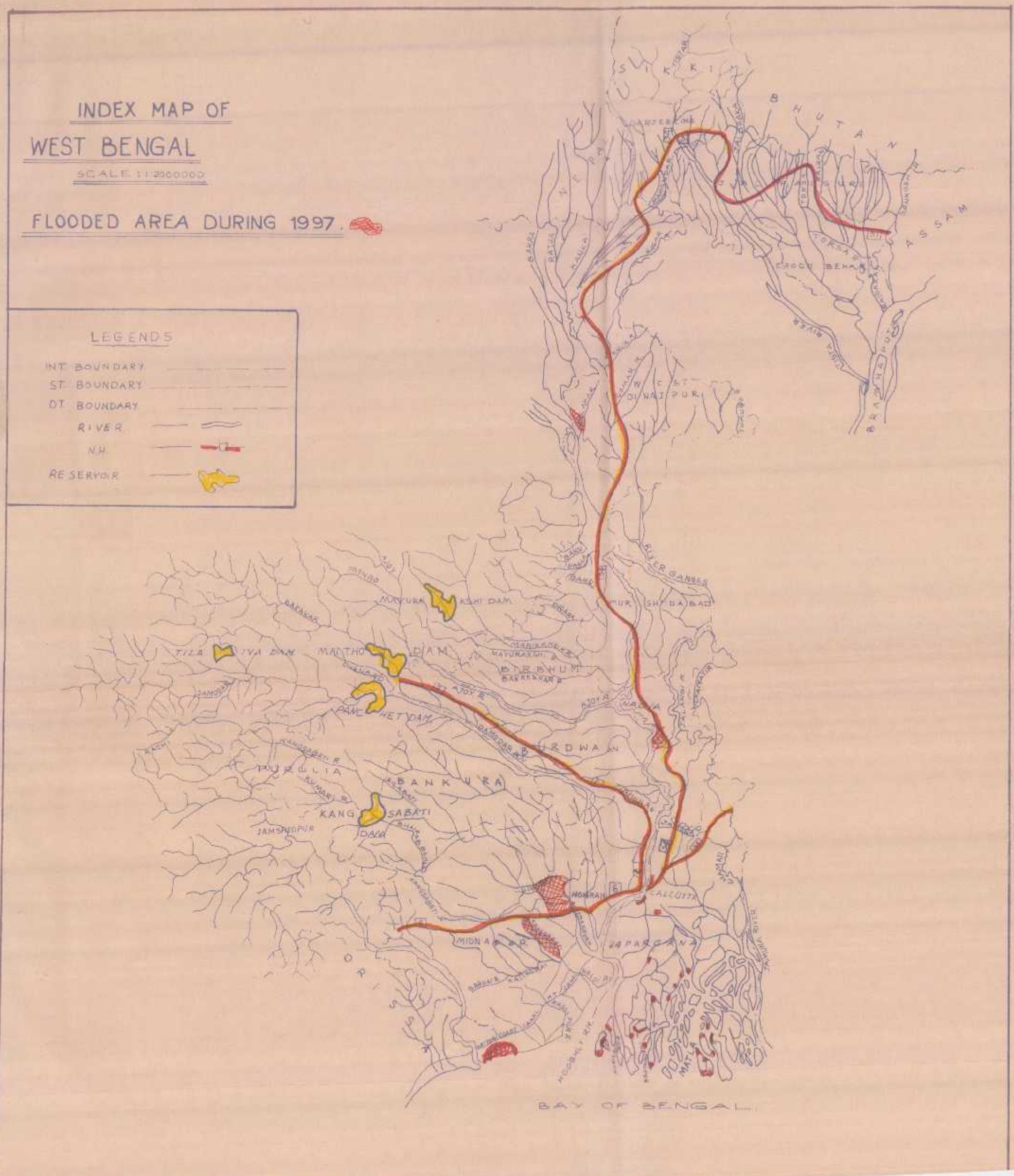
TABLE SHOWING DISTRICT-WISE TOTAL AMOUNT REQUIRED FO[illegible]IAL AND FINAL RESRORATION WORK IN CONNECTION WITH FLOOD DAMAGES DURING THE FLOOD OF JUNE, JULY & AUGUST, 1997

Sl.No.	Name of th e District	Amount for Initial Restoration works (Rs. in lacs)	Amount required for Final Restoration Works (Rs. in lacs)	Total amount required for Initial and Final Restoration Works (Rs. in lacs)
1.	2.	3.	4.	5.
1.	Midnapore	779.00	559.00	1338.00
2.	South 24-Parganas	283.00	631.00	914.00
3.	North 24-Parganas	128.00	198.00	326.00
4.	Maldah	70.00	--	70.00
5.	Hooghly	2.00	3.00	5.00
6.	Howrah	20.00	25.00	45.00
7.	Greater Calcutta	95.00	--	95.00
	Grand Total	Rs.1377.00	Rs.1416.00	Rs.2793.00

INDEX MAP OF WEST BENGAL

SCALE 1:2900000

FLOODED AREA DURING 1997.



INDEX MAP OF
WEST BENGAL

SCALE: 1:2000000

FLOODED AREA DURING 199 -

HYDROLOGICAL STATIONS -

LEGENDS

INT. BOUNDARY

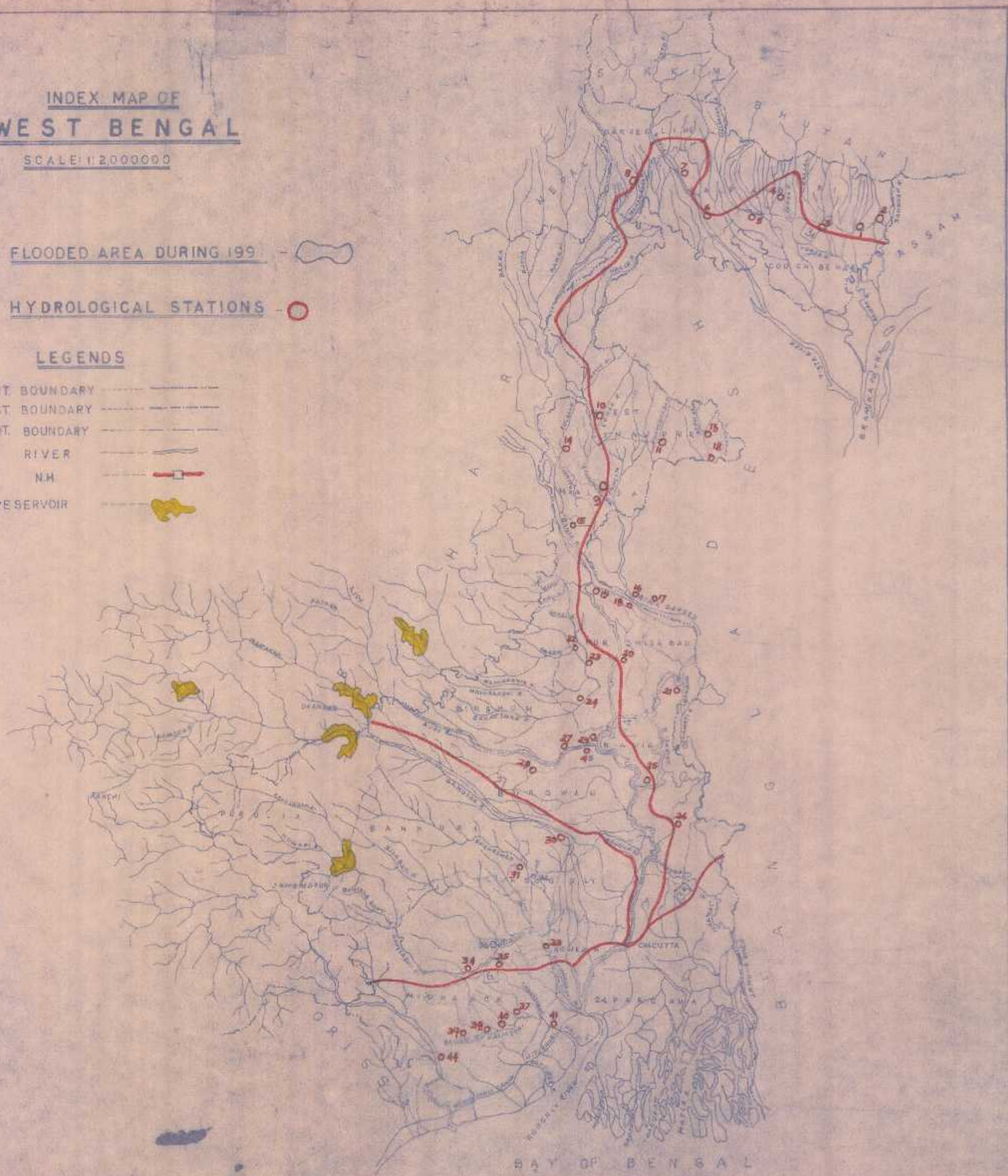
ST. BOUNDARY

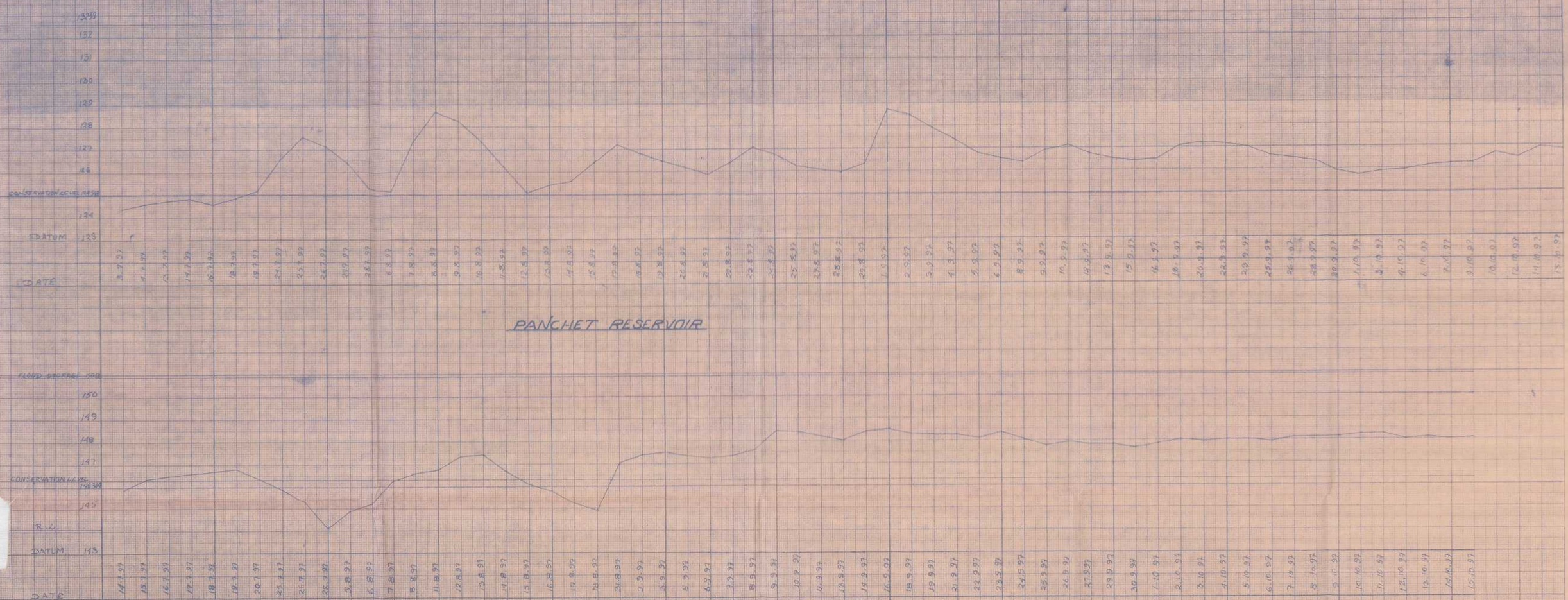
DT. BOUNDARY

RIVER

N.H.

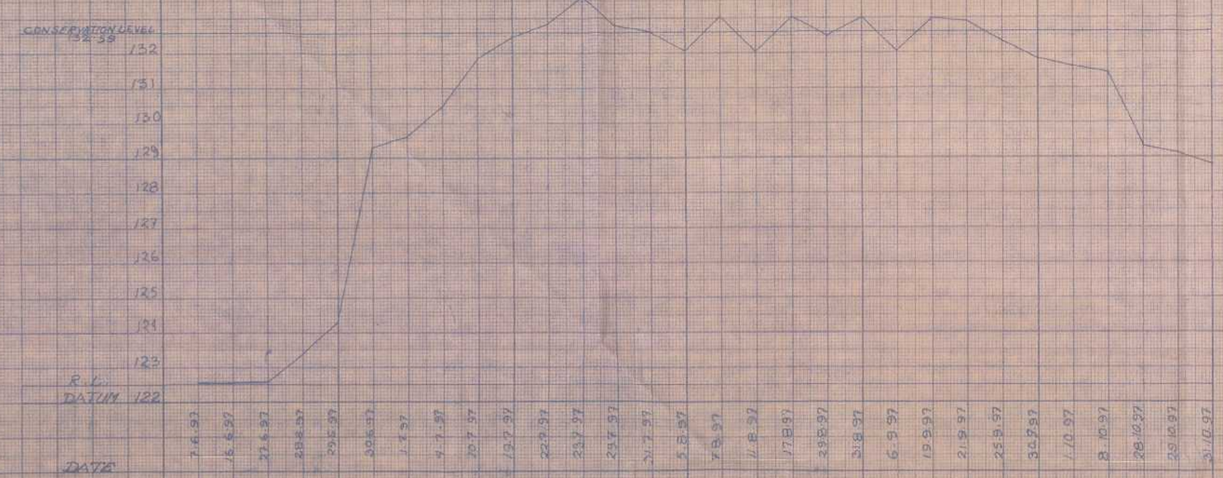
RESERVOIR



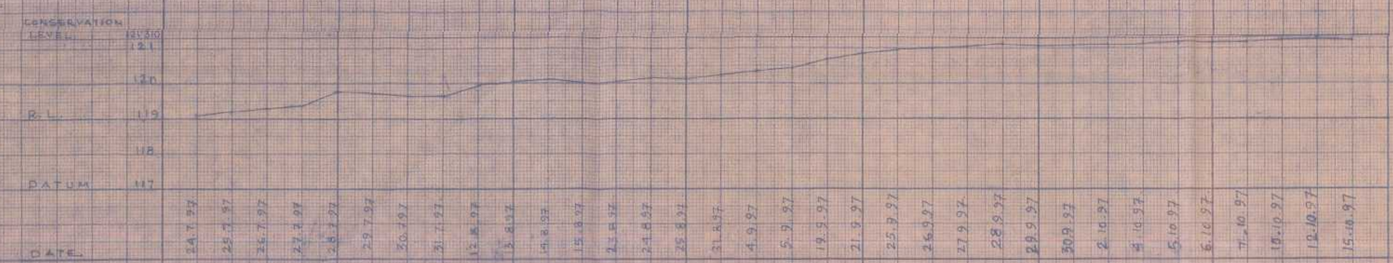


PANCHET RESERVOIR

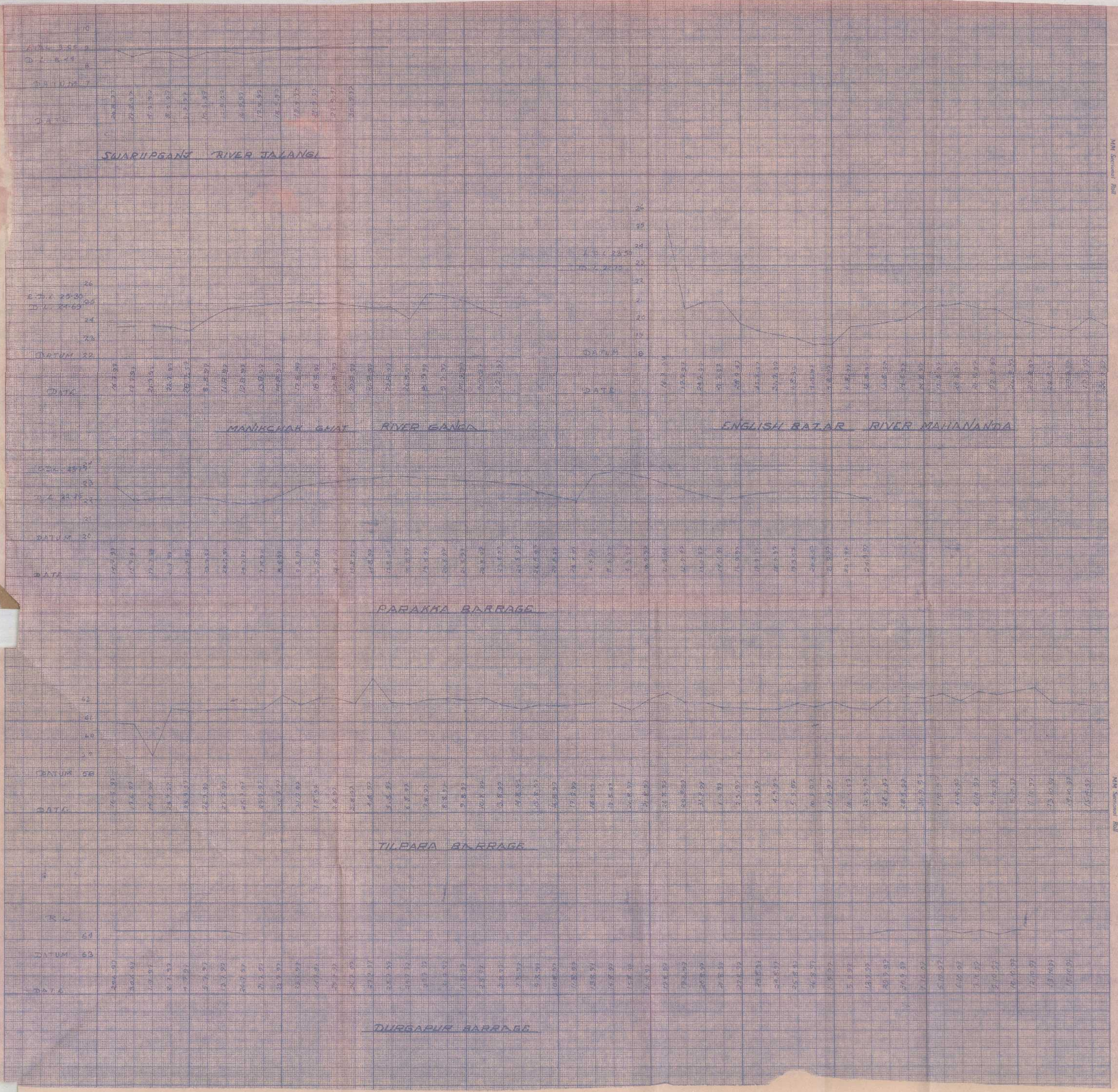
MAITHON RESERVOIR



KANGSABATI RESERVOIR



MASSANJORE RESERVOIR


SWARUPGANJ RIVER JALANGI
MANIKCHAK GHAT RIVER GANGA
ENGLISH BAZAR RIVER MAHANANDA
FARAKKA BARRAGE
TILPARA BARRAGE
DURGAPUR BARRAGE
DATUM
DATE
R.L.