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ANNUAL FLOOD REPORT 1994

IRRIGATION & WATERWAYS DIRECTORATE

GOVERNMENT OF WEST BENGAL

CALCUTTA, APRIL, 1995

FLOOD LEVELS OF WEST BENGAL
RIVERS DURING 1994

(CENTRAL BENCAL RIVERS IN TERMS OF SIGNAL IMPOSITION)

W.L :- Water Level
U.A. :- Unprotected Area
P.A. :- Protected Area
H.W.L. :- Highest Water Level

| Serial No. | Name of River with Gauge/Flood Plane | District | Y.S. | | R.S. | | Date & time | W.L. (m) | Remarks |
|------------|---|----------|------|------|------|------|---|-------------|--|
| | | | U.A. | P.A. | U.A. | P.A. | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | 8 | 9. | 10. |
| 1. | Unprotected areas of P.S. Kaliachak, Manik- chak (including Bhutni Diara Area) and English Bazar in the Ganga Flood Plane. | Maldah | | | | | 12.00 hours on 22.9 6.00 hours on 26.9. | -- | R.S. Imposed R.S. Withdrawn |
| 2. | Protected areas of the above Flood Plane of River Ganga. | Maldah | | | | | 6.00 hours on 23.9. 6.00 hours on 24.9. 12.00 hours on 25.9. | 25.569 | R.S. Imposed Max. Level R.S. withdrawn |
| 3. | Unprotected areas of P.S. Harish- chandrapur Khebra & Ratua of the above Flood Plane of River Ganga. | Maldah | | | | | 6.00 hours on 21.9. 6.00 hours on 27.9. | | Y.S. imposed Y.S. withdrawn |

FLOOD LEVELS OF RIVERS WEST BENGAL DURING 1991

(CENTRAL BENGAL RIVERS IN TERMS OF CROSSING DANGER LEVEL)

D.L. :- DANGER LEVEL

E.D.L. :- EXTREME DANGER LEVEL

W.L. :- WATER LEVEL

H.W.L. :- HIGHEST WATER LEVEL

All levels in metre

| Serial No. (1) | Name of River (2) | Gauge (3) | District. (4) | D.L. (5) | E.D.L. (6) | Date & Time (7) | W.L. (8) | Remarks (9) |
|-------------------|----------------------|--------------|------------------|-------------|---------------|--------------------|-------------|----------------|
| 1. | Ganga | Farakka | Murshidabad | 22.25 | 23.77 | 6.00 hours on 26.7 | 22.76 | Above D.L. |
| | | | | | | -do- on 2.8 | 22.67 | -do- |
| | | | | | | -do- on 3.8 | 22.70 | -do- |
| | | | | | | -do- on 4.8 | 22.83 | -do- |
| | | | | | | -do- on 7.8 | 22.89 | -do- |
| | | | | | | -do- on 8.8 | 23.27 | -do- |
| | | | | | | -do- on 10.8 | 23.40 | -do- |
| | | | | | | -do- on 12.8 | 23.62 | -do- |
| | | | | | | -do- on 16.8 | 24.34 | Above E.D.L. |
| | | | | | | -do- on 17.8 | 24.43 | -do- |
| | | | | | | -do- on 18.8 | 24.47 | -do- |
| | | | | | | -do- on 21.8 | 24.27 | -do- |
| | | | | | | -do- on 22.8 | 24.17 | -do- |
| | | | | | | -do- on 23.8 | 24.07 | -do- |
| | | | | | | -do- on 25.8 | 23.94 | -do- |
| | | | | | | -do- on 26.8 | 23.70 | Above D.L. |
| | | | | | | -do- on 29.8 | 23.27 | -do- |
| | | | | | | -do- on 30.8 | 23.36 | -do- |
| | | | | | | -do- on 31.8 | 23.25 | -do- |
| | | | | | | -do- on 1.9 | 23.35 | -do- |
| | | | | | | -do- on 4.9 | 23.36 | -do- |

| Serial No. | Name of river | Gauge at | District | Height | E.L.L. | Date & Time | W. L. | Remarks |
|-------------|---------------|---------------|----------|---------------------------|--------|--------------------|-----------------------------|--------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 1. (contd.) | | | | | | | | |
| | | | | | | -do- on 5.9. | 23.25 | -do- |
| | | | | | | -do- on 7.9. | 23.14 | -do- |
| | | | | | | -do- on 8.9. | 22.83 | -do- |
| | | | | | | -do- on 11.9 | 22.26 | -do- |
| | | | | | | -do- on 12.9 | 22.28 | -do- |
| | | | | | | -do- on 13.9 | 22.28 | -do- |
| | | | | | | -do- on 14.9 | 22.30 | -do- |
| | | | | | | -do- on 15.9. | 22.34 | -do- |
| | | | | | | -do- on 18.9 | 22.83 | -do- |
| | | | | | | -do- on 19.9 | 22.84 | -do- |
| | | | | | | -do- on 20.9 | 22.75 | -do- |
| | | | | | | -do- on 21.9 | 23.12 | -do- |
| | | | | | | -do- on 25.9 | 23.27 | -do- |
| | | | | | | -do- on 26.9 | 22.87 | -do- |
| | | | | | | -do- on 27.9 | 22.48 | -do- |
| | | | | | | -do- on 29.9 | 22.74 | -do- |
| 2. | Ganga | Manikchakghat | Maldah | 22.68 24.68 | 25.30 | 6.00 hours on 11.8 | 24.959 | Above D.L. |
| | | | | | | -do- on 12.8 | 25.139 | -do- |
| | | | | | | -do- on 16.8 | 25.829 | Above E.D.L. |
| | | | | | | -do- on 17.8. | 25.889 | -do- |
| | | | | | | -do- on 18.8 | 25.814 | -do- |
| | | | | | | -do- on 19.8 | 25.744 | -do- |
| | | | | | | -do- on 22.8 | 25.404 | -do- |
| | | | | | | -do- on 23.8. | 25.30 | -do- |
| | | | | | | -do- on 25.8 | 25.85 | -do- |
| | | | | | | -do- on 26.8. | 24.70 | Above D.L. |
| | | | | | | -do- on 1.9 | 24.715 | -do- |
| | | | | | | -do- on 2.9 | 24.745 | -do- |
| | | | | | | -do- on 4.9. | 24.625 24.625 | -do- |

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|-----|--------|----------|-------------|-------|------------------|--------------------|-------|--------------------------|
| 3. | Ga nga | Nurpur | Murshidabad | 21.63 | 21.64 | 6.00 hours on 7.8 | 21.27 | Above D.L. |
| | | | | | | 6.00 hours on 11.8 | 21.67 | Above E.D.L. |
| | | | | | | -do- on 14.8 | 22.11 | -do- |
| | | | | | | -do- on 15.8 | 22.31 | -do- |
| | | | | | | -do- on 16.8 | 22.48 | -do- |
| | | | | | | -do- on 17.8 | 22.55 | -do- |
| | | | | | | -do- on 21.8 | 22.53 | -do- |
| | | | | | | -do- on 22.8 | 21.39 | -do- |
| | | | | | | -do- on 23.8 | 22.30 | -do- |
| | | | | | | -do- on 24.8 | 22.12 | -do- |
| | | | | | | -do- on 25.8 | 21.92 | -do- |
| | | | | | | -do- on 28.8 | 21.33 | Above D.L. |
| | | | | | | -do- on 30.8 | 21.39 | -do- |
| | | | | | | -do- on 31.8 | 21.42 | -do- |
| | | | | | | -do- on 2.9 | 21.64 | xxx Above EDL |
| | | | | | | -do- on 6.9 | 21.23 | above D.L. |
| | | | | | | -do- on 7.9 | 21.23 | above D.L. |
| 4. | Ganga | Giriya | -do- | 20.57 | 21.18 | 6.00 hours on 7.8 | 20.65 | Above D.L. |
| | | | | | 21.18 | 6.00 hours on 14.8 | 21.53 | Above E.D.L. |
| | | | | | | -do- on 15.8 | 21.74 | -do- |
| | | | | | | -do- on 16.8 | 21.90 | -do- |
| | | | | | | -do- on 17.8 | 21.87 | -do- |
| | | | | | | -do- on 21.8 | 21.91 | -do- |
| | | | | | | -do- on 22.8 | 21.81 | -do- |
| | | | | | | -do- on 23.8 | 21.74 | -do- |
| | | | | | | -do- on 24.8 | 21.61 | -do- |
| | | | | | | -do- on 25.8 | 21.33 | -do- |
| | | | | | | -do- on 28.8 | 20.71 | -do- |
| | | | | | | -do- on 30.8 | 20.78 | Above D.L. |
| | | | | | | -do- on 31.8 | 20.79 | -do- |
| | | | | | | -do- on 2.9 | 20.82 | -do- |
| | | | | | | -do- on 25.9 | 20.80 | -do- |
| | Ganga | Chakghat | Murshidabad | 20.88 | 21.49 | -do- on 14.8 | 21.08 | Above D.L. |
| | | | | | | -do- on 16.8 | 21.44 | -do- |
| | | | | | | -do- on 17.8 | 21.51 | Above E.D.L. |
| | | | | | | -do- on 21.8 | 21.50 | -do- |
| | | | | | | -do- on 22.8 | 21.37 | Above D.L. |

| 2. | 3. | 4. | 5. | 6. | 7. | 8. |
|--------------|--------------------|-------------|-------|-------|--------------------|--------------|
| Ganga | Chakghat | Murshidabad | 20.00 | 21.49 | 6.00 hours on 23.0 | 22.20 |
| | | | | | -do- on 24.0 | 21.18 |
| | | | | | on 25.0 | 21.92 |
| . Bhagirathi | Gangipura | Murshidabad | 20.27 | 20.00 | 6.00 hours on 16.0 | 20.34 |
| | | | | | | Above D.L. |
| . Bhairab | Akheriganj | Murshidabad | 10.44 | 19.05 | 6.00 hours on 17.0 | 18.63 |
| | | | | | | Above D.L. |
| . Dwarka | Sankoghat | Murshidabad | 20.42 | 21.31 | 9.00 hours on 17.0 | 20.71 |
| | | | | | -do- on 29.0 | 20.67 |
| | | | | | | -do- |
| . Jalangi | Swarupganj | Nadia | 0.44 | 9.05 | 6.00 hours on 22.0 | 0.69 |
| | | | | | -do- on 23.0 | 0.66 |
| | | | | | -do- on 24.0 | 0.57 |
| | | | | | -do- on 25.0 | 0.53 |
| | | | | | -do- on 26.0 | 0.59 |
| | | | | | -do- on 30.0 | 0.82 |
| | | | | | -do- on 31.0 | 0.77 |
| | | | | | | -do- |
| . Jallangi | Swarupganj | Nadia | 0.44 | 9.05 | 6.00 hours on 1.9 | 0.72 |
| | | | | | -do- on 2.9 | 0.65 |
| | | | | | -do- on 5.9 | 0.54 |
| | | | | | -do- on 6.9 | 0.40 |
| | | | | | -do- on 7.9 | 0.39 |
| | | | | | | -do- |
| . Fulahar | Teljana | Malda | 27.44 | 20.35 | 6.00 hours on 17.0 | 20.39 |
| | (Protected) | | | | 6.00 hours on 24.0 | 27.56 |
| | | | | | 6.00 hours on 25.0 | 27.47 |
| | -do- (Unprotected) | | 26.52 | 27.07 | -do- on 22.9 | 27.13 |
| | | | | | | Above E.D.L. |
| | | | | | | Above D.L. |
| | | | | | | -do- |
| | | | | | | Above E.D.L. |
| . Ganga | Jalangi Bazar | Murshidabad | 16.76 | 17.37 | 6.00 hours on 22.0 | 16.44 |
| | | | | | | H.W.L. |

FLOOD LEVELS OF RIVERS OF WEST BENGAL DURING 1951

(SOUTH BENGAL RIVERS IN TERMS OF CROSSING ON THE RIVER)

1.- DANGER LEVEL
2.- EXTREME DANGER LEVEL
3.- WATER LEVEL

ALL LEVELS IN METERS

| Serial No. | Name of River | Gauge at | District | D.L. (m) | E.D.L. (m) | Date & Time | W.L. (m) | Remarks |
|------------|---------------|-------------|-----------|-------------|---------------|--------------------|-------------|--------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 1. | Kaliaghye | Ambaria | Midnapur | 5.75 | 6.4 | 6.00 hours on 20.7 | 6.00 | Above D.L. |
| | | | | | | -do- on 14.9 | 6.33 | -do- |
| 2. | Kaliaghye | Pohati | Midnapur | 6.55 | 7.0 | 6.00 hours on 14.7 | 6.55 | Above D.L. |
| | | | | | | -do- on 15.7 | 6.90 | -do- |
| | | | | | | -do- on 16.7 | 6.04 | -do- |
| | | | | | | -do- on 17.7 | 6.79 | -do- |
| | | | | | | -do- on 18.7 | 6.60 | -do- |
| | | | | | | -do- on 12.9 | 7.32 | Above E.D.L. |
| | | | | | | -do- on 13.9 | 7.34 | -do- |
| | | | | | | -do- on 14.9 | 7.06 | -do- |
| | | | | | | -do- on 15.9 | 6.01 | Above D.L. |
| 3. | Kaliaghye | Shakrabad | Midnapur | 6.40 | 7.05 | 9.00 hours on 13.7 | 6.40 | Above D.L. |
| 4. | Kapaleswari | Narayanbarh | Midnapore | 5.33 | 5.94 | -do- on 14.7 | 6.90 | Above E.D.L. |
| | | | | | | 15.00 hours on 4.7 | 5.33 | Above D.L. |
| | | | | | | 6.00 hours on 20.7 | 5.40 | -do- |
| | | | | | | -do- on 12.9 | 5.07 | -do- |
| | | | | | | -do- on 13.9 | 5.90 | -do- |
| 5. | Chandia | Barisha | Midnapur | 4.57 | 5.03 | 6.00 hours on 23.7 | 4.6 | Above D.L. |
| | | | | | | -do- on 25.7 | 4.63 | -do- |
| 6. | Cossye | Kanastikri | Midnapur | 16.00 | 16.61 | 6.00 hours on 22.7 | 16.05 | Above E.D.L. |

| 1. | 2. | 3. | 4. | 5. | 6. | | | |
|-----|------------|------------|----------|-------|-------|---------------------|-------|--------------|
| 6. | Cossye | Karastik | Midnapur | 16.00 | 16.61 | 6.00 hours on 23.7 | 16.15 | Above D.L. |
| | | | | | | 5.00 hours on 1.0 | 16.67 | Above E.D.L. |
| 7. | Cossye | Panskura | Midnapur | 9.29 | 9.99 | 6.00 hours on 21.7 | 9.43 | Above D.L. |
| | | | | | | 6.00 hours on 22.7 | 9.74 | Above E.D.L. |
| | | | | | | 6.00 hours on 23.7 | 9.43 | Above D.L. |
| | | | | | | 5.30 hours on 1.0 | 9.29 | Above D.L. |
| 8. | Old Cossye | Kalmajola | Midnapur | 9.00 | 9.60 | 6.00 hours on 21.7 | 10.12 | Above E.D.L. |
| | | | | | | 6.00 hours on 22.7 | 10.39 | Above E.D.L. |
| | | | | | | 6.00 hours on 23.7 | 9.75 | Above E.D.L. |
| | | | | | | 2.00 hours on 1.0 | 9.60 | Above E.D.L. |
| | | | | | | 6.00 hours on 1.0 | 10.33 | Above E.D.L. |
| | | | | | | 9.00 hours on 1.0 | 10.54 | Above E.D.L. |
| | | | | | | 11.00 hours on 1.0 | 10.91 | Above E.D.L. |
| | | | | | | 15.00 hours on 1.0 | 10.94 | Above E.D.L. |
| | | | | | | 17.00 hours on 1.0 | 10.97 | Above E.D.L. |
| 9. | Cossye | Mohanpur | Midnapur | 25.75 | 26.36 | 6.00 hours on 22.7 | 25.75 | Above D.L. |
| | | | | | | 16.30 hours on 31.7 | 25.75 | Above D.L. |
| | | | | | | 17.45 hours on 31.7 | 25.86 | Above D.L. |
| | | | | | | 8.00 hours on 1.0 | 26.60 | Above E.D.L. |
| | | | | | | 22.00 hours on 1.0 | 26.36 | Above E.D.L. |
| | | | | | | 6.00 hours on 1.0 | 15.09 | Above D.L. |
| | | | | | | 8.00 hours on 2.0 | 5.70 | Above E.D.L. |
| 10. | Silabati | Banka | Midnapur | 15.00 | 15.69 | 13.00 hours on 2.0 | 5.66 | Above D.L. |
| 11. | Runnarayan | Ranichak | Midnapur | 5.33 | 5.94 | 6.00 hours on 3.0 | 12.40 | |
| 12. | Damodar | Anta | Howrah | 5.64 | 6.24 | | | |
| 13. | Mundeswari | Harinkhola | Hooghly | 12.00 | 13.41 | | | |

A N N E X U R E - V

Area flooded In different districts of West Bengal during 1994

| <u>Serial No.</u> | <u>Name of District</u> | <u>Geographical Area in Sq. KM.</u> | <u>Area flooded in Sq. Km</u> |
|-------------------|-------------------------|---|-----------------------------------|
| 1. | Cooch-Behar | 3386 | Nil. |
| 2. | Jalpaiguri | 6245 | Nil. |
| 3. | Darjeeling | 3 075 | Nil. |
| 4. | Uttar Dinajpur | 5206 | Nil. |
| 5. | Dakshin Dinajpur | | Nil. |
| 6. | Maldah | 3713 | 24 |
| 7. | Murshidabad | 5341 | 16 |
| 8. | Nadia | 39 26 | 02 |
| 9. | Burdwan | 7028 | Nil. |
| 10. | Birbhum | 4545 | Nil. |
| 11. | Howrah | 1467 | 30 |
| 12. | 24-Parganas(North) | 13796 | 04 |
| 13. | 24-Parganas(South) | | 19 |
| 14. | Durulia | 6259 | Nil. |
| 15. | Bankura | 6881 | Nil. |
| 16. | Hooghly | 3145 | 15 |
| 17. | Midnapore | 13724 | 33 |
| | | <u>87,853</u> | <u>143</u> |

A N N E X U R E -VII

General Abstract of estimated cost of Flood
Damage Repairs and Restoration Works

| Serial No. | Name of District | Estimated cost of Repairs/ Restoration works(Rs.in Lakhs) |
|------------|--------------------------|--|
| 1. | Jalpaiguri | 4.45 |
| 2. | Darjeeling | 3.30 |
| 3. | Midnapore | 37.00 |
| 4. | Hooghly | 9.00 |
| 5. | Howrah | 35.00 |
| 6. | 24-Parganas(South) | 185.00 |
| 7. | 24-Parganas(North) | 80.00 |
| 8. | Nadia | 15.00 |
| 9. | Murshidabad | 40.00 |
| 10. | Malda | 766.00 |
| 11. | Uttar & Dakshin Dinajpur | 20.00 |

Total for West Bengal:1194.75

ANNEXURE - VII-A.

Damages caused to Flood embankment and other flood protective works during the flood of 1994.

DISTRICT OF JALPAIGURI

| Serial No. | Name of work | Type of Damage | Approx cost of damage |
|------------|--|--|-----------------------|
| 1. | Protection on the Left Bank of river Mahananda at Prakashnagar in P.S. Raiganj. | Apron washed away. | 45,000/- |
| 2. | Protection on the Left Bank of river Mahananda at Dadabhai Colony in P.S. Raiganj. | Bed bar with apron washed away. | 50,000/- |
| 3. | Jalpaiguri Town Protective embankment. | Complete erosion of the unarmoured embankment from ch.15.70 KM to 16.05 KM | 3,50 Lakh |

Total : 4,45,000

ANNEXURE - VII C

Damages caused to Flood Embankment and other
Flood Protective Works during the flood of 1994

DISTRICT OF DARJEELING

| Serial No. | Name of Work. | Type of Damage | Approx. Cost of Damage. |
|------------|---|-----------------------------------|--------------------------------|
| 1. | Protection of Right Bank of river Mahananda to prevent avulsion of river Mahananda into river Mahananda Nagradoba & Mahismari in P.S. Siliguri, District-Darjeeling. | Boulder sausage Embankment | 2.50 Lakhs |
| 2. | Protection on the Right Bank of river Champita in P.S. Matigara. | Bed bar Collapsed. | Rs. 40,000/- |
| 3. | Protection on the Right Bank of river Balason at Kaskhali and Porajhar village at up-stream of B.G. Railway Bridge in P.S. Siliguri | Toe of earthen embankment eroded. | Rs. 40,000/- |
| | | | <hr/> Total Rs. 3,30,000 <hr/> |

Damages caused to Flood Embankment
and other Flood Protective Works
during the Flood of 1994.

DISTRICT OF MIDNAPORE

| Serial No. | Location | Type of damage | Approx. cost of damage |
|------------|--|---|-----------------------------|
| 1. | TE H ₂ embank- ment on Right Bank of Old Cossye at Bhabanipur | About 450 Ft length of embankment washed away. | 25.00 Lakh |
| 2. | Mohankhali embankment at Basantpur | Subsided for a length of about 40M and a depth of 1.5M | 2.00 Lakh |
| | | | <hr/> Total :37 Lakhs <hr/> |

ANNEXURE - V I I E

Damage caused during the Flood of 1894

DISTRICT OF HOOGHLY

| Serial No. | Location | Type of Damage | Approx. cost of damage. |
|------------|--|---------------------|-------------------------|
| 1(a) | Sluice on Damodar left embankment at Sempur in Pursura. | Sluice damaged | 94,000/- |
| (b) | Embankment at Bali-Masjitala Udayrajpur on Damodar Right Embankment. | Embankment damaged. | 8.06 Lakh |
| Total : | | | 9.00 Lakh |

DISTRICT : HOWRAH

| | | | |
|---------|--|------------------------|------------|
| 1. | Left bank of river Rupnarayan at Charkantapukuria. | bank erosion occurred. | 35.00 Lakh |
| Total : | | | 35.00 Lakh |

ANNEXURE - VII F

Damages caused to Flood Embankment and other
Flood Protective Works during the Flood of 1994

DISTRICT : 24 PARGANAS (SOUTH)

| SERIAL NO. | Police Station. | Name of Rivers. | Type of Damage | Approx cost of damage |
|------------|---|---|---|-----------------------|
| 1. | Kakdwip, Sagar Patharpratima, Namkhana. | Hooghly, Muriganga, Saptamukhi | 245 M length washed away, 50,000M length severely dama- ged 14,600M length partially damaged. | 50 Lakh. |
| 2. | Gosaba, Basanti, Canning, Mathurapur. | Matla, Thakuran, Bidya, Goniar, Roymongal, Hogal. | 250M length washed away 45,000M seve- rely damaged 20,000 M partially damaged. | 95 Lakh. |
| 3. | Diamond Harbour, Kulpi. | Hooghly, (Left Bank) | 50M washed away, 3000M severely damaged. 1500M partially damaged. | 40 Lakh |

Total Rs. 100 Lakh

DISTRICT : 24 PARGANAS (NORTH)

| | | | | |
|----|---|--|--|----------|
| 1. | Basirhat, Hasnabad, Haroa, Sandeshkhali. Swarupnagar, Hingalgunj, Minakhan, | Ichamati, Bidyadhari, Kalindri, Cotokalagachi, Dansa, Sahebkhali. | 100M washed away, 20,000 M severely damaged, 8000M partially damaged. | 80 Lakh. |
|----|---|--|--|----------|

Statement showing Damages to Engineering works during
flood embkt./river bank, Protective works during
the Flood of 1994

ANNEXURE - VII G

DISTRICT - NADIA

(Rupees in lacs)

| Serial | Particulars of damages caused to the Engineering works and quantum of such damages. | Approx. cost of damage (in lakhs) |
|--------|--|--------------------------------------|
| 1. | i) Damages to different flood protective embtts. at Gopia, Kadamtala, Gurguria, Bahadurpur Jagatkhali (34 Mks. approx.) | 5.00 lakhs. |
| | ii) Damages to Bank protective works at Frachin Mayapur, Serakhali, Tarapur, Bapujinagar, Jurenpur, Ghasuniidanga, Avoynagar, Palirah, Palashipara, Hatisala & Ghurni, covering a total length of 1.04 Kg. | 5.00 lakhs |
| | iii) Damages to sluices & other structures 48 Nos. | 5.00 lakhs |

Total \$15.00

DISTRICT - MURSHIDABAD

ANNEXURE - VII-H

| | | |
|----|---|-------------|
| 2. | i) Damages to different flood protective embankment of Mayurakshi, Kuya, Babla river system (45 kms.) | 10.00 lakhs |
| | ii) Damages to different flood protective embkt. of Dwarka, Brahmani river system (12 Kms.) | 10.00 lakhs |
| | iii) Damages to different flood protective embankment of Jallangi, Bhairab river system (11 kms.) | 5.00 Lakhs |
| | iv) Damages to Bank protective works sluice & other structures (15 nos.) | 5.00 lakhs |
| | v) Damages to the Ganga Bhagirathi embankment at Sekhalipur in P.S. Lalgola length of breached and collapsed embankment (85 metres) | 10.00 lakhs |
| | vi) Damages to the bed bar no. 1, 2, & 3 at Aurangabad. | 10.00 lakhs |
| | vii) Aggressive bank erosion on the right bank of Ganga/Padma was noticed this year particularly in the areas Sekhalipur in P.S. Lalgola, Rajanagar & Nalbona in P.S. Raninagar, Hassanpur & Islampur area in P.S. Suti Paikmari & Chan-Khettybari area in P.S. Bhagangola. | 10.00 lakhs |

40.00 Lakhs

Contd.

L I S T O F M A P S

1. MAPS OF WEST BENGAL SHOWING FLOODED
AREA DURING 1994) 1995
2. MAP OF WEST BENGAL SHOWING HYDROLOGICAL STATIONS

L I S T O F D R A W I N G S

1. RESERVOIR LEVELS DURING (1994) 1995
2. GAUGE LEVELS DURING (1994.) 1995

ANNUAL FLOOD REPORT OF WEST BENGAL
FOR THE YEAR - 1994

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

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 $21^{\circ} 31'$ and $27^{\circ} 13' 14''$ North latitudes and $85^{\circ} 45' 20''$ and $98^{\circ} 53'$ 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 " |
| 4. Area already protected | = 26,500 " |

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 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 Subdarban area. | - 71,485 Km ² |
| 3) Subarnarekha Basin. | - 2,160 Km ² |

1.2 RIVER SYSTEMS

1.2.1 Brahmaputra Basin Drainage the northern regions of the State, the rivers within the Brahmaputra system consists of a total area of 14,200 Km² the main rivers being Sankosh, Raidak, Torsa, Kaljani, Jaldhaka, Teesta.

Contd - - P/2

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, Ghargharia, Goram, Dina, Pana, Jainti, Gabur Basra. |
| D. Jaladhaka | - Mujnai, Murti, Diana, Sutanga, Dolong, Dharala, Ghatia, Kumlai, Gilandi, Buduya. |
| E. Teesta | - Great Rangeet, Raman, Rangpo, Relli, Lish, Ghish, Chel, Mal, Neoro, 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 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 6400 Min Bhutan. The river bifurcate into two channels at Bhutanghat, close close to Indo-Bhutan border. One of the branches, namely Raidak-I joints the united stream of Torsa and Kaljani, while the Raidak-II is joined by Sankosh and outfalls into Brahmaputra in Bangladesh by the name Gangadhar.

C. Torsa :- The river Torsa in Chumbi Valley of Souther 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 Kaljani river and Raidak-I. The combined flow outfalls into Brahmaputra near Nageswari at Rangpur in Bangladesh.

I. Jaldhaka :- The river has its origin Bitang lake in Sikkim at an altitude of 4400M. It flows through Sikkim, Bhutan, West Bengal and Bangladesh. After the river is joined by a number of streams and tributaries both in the mountaneous and Sub-mountaneous regions, it 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 Km 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.

contd...p/4

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 through the narrow Central waist line of the present shape of this State had been an active delta builder.

The Ganga system comprise a total area of 71,485 KM² within the State of West Bengal. The catchment areas of different rivers within this system in the State of West Bengal are as under :-

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

contd. ... 1/4 5

The different tributaries of these rivers are listed below :-

1. Punarbhaba-Punarbhaba
2. Mahananda-Mechi, Balasan, Lauk, Nagar, Kulik, Gumar, Chiramati, Tangon.
3. Atrai-Atrai.
4. Pagla- Bansloi - Pagla, Bansloi, Bagmari.
5. Brahmani- Dwarka - Brahmani, Dwarka.
6. Bhagirathi-Hooghly - Bhagirathi, Hooghly.
7. Jalangi - Jalangi, Silamari, Bhairab, Suti.
8. Mayurekshi - Mayurakshi, Babla, Noon Beel, Siddheswari, Kuiya, Bakreswar, Kopai, Sal, Monikarnia, Daoki, Kana Mor, Gambhira.
9. Ajoy - Ajoy, Hinglow, Kumoor.
10. Khari-Gangur-Ghea - Khari, Brahmani, Banka, Bangur, Ghea, Behula, Kana.
11. Churni. - Churni.
12. Damodar - Damodar, Barakar, Sali.
13. Dwarakeswar - Gandheswari, Arksha, Berai, Dwarakeswar.
14. Rupnarayan - Mundeswari, Dwarkeswar, Gandheswar, Berai, Damodar, Tarjuli, Sankari, Silabati, Joypana, Kubai, Parang, Kanki.
15. Haldi - Haldi, Kangsabati, Kumari, Bhairab, Banki, Tarafeni, Kaliaghai, Bagchai, Chandra, Kapaleswari.
16. Rasulpur - Rasulpur, Dichaban.
17. Tidal Rivers - Tolly's Nullah, Keorapukur, Ichamati, Raimangal, Kultigong, Jamuna, Kalindi, Haria Bhanga, Gosaba, Motia, Diali, Thakurani, Raidighi, Saptamukhi, Muri Ganga.

Contd. -- 4/5

A. Brief note on the above Sub-basins

- 1) Mahananda- The river Mahananda originates from Paglajhora near Kurseong town. It bifurcates into two channels, viz. Fulahar branch which flows through 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 Doggoright just downstream of the point where Ganga leaves the boundary of West Bengal.
2. Atrai :- Punarbhaba some rivers like Sahu, Nim, Talma, Chani, Denga originated from the highlands 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 reenters West Bengal Kumarganj P. S. of West Dinajpur district. Covering some x length in the State of it reenters into Bangladesh and ultimate outfalls into Brahmaputra.

Contd... p/7

7
° X °

The Dhepa on the other hand taking a south-Western course enters Gangarampur P. S. in West Bengal district, assuming the name Funarbhaba. 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. The ultimately outfall into Mahananda.

Nagar originating in Bangladesh flows along the boundary with West Bengal. Taking a southerly 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 other small rivers that flow through West Dinajpur district before meeting the combined and combined stream which ultimately outfalls into Mahananda.

Tangon is a tributary to Mahananda. It rises in Bangladesh. After flowing through the districts of West Dinajpur, 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.

Contd. - - 1/8

Pagla Bansloi-Brahmani :-

These rivers rise in Rajmahal hills of Bihar. Flowing eastward 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 Kms 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 emptying 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. Lalbagh 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 rises near to 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 bifurcated into two channels, the Western branch, i.e. Churni runs a few Kms in the district in a South-West direction to meet Bhagirathi. The other branch as Ichamati which gets little supply from Mahananda and thrives on wash outs and 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 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 down stream due to the run off and outflow from a number of eastern and western tributaries.

Contd. - P/9

After its confluence with Jala ngi, Bhagirathi is known as Hooghly and forms the boundary between 24-Parganas(North and Hooghly districts.

8. Mayurakshi-Babla :- Mayurakshi originates from the high lands of Santhal Parganas. It is the main river in Birbhum ~~xxxx~~ district. Carrying flows of different tributaries, its outfalls into Hijol Beel of Murshidabad district. Babla 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 are Patro, Janiti, Darua, Kunoor and Hinglow.

10) Danodar :- It rises in the Palamoo hills in Bihar. The river bifurcates into two channels at Beguahana. The main flow passed through Mundeswari channel and discharges into Rupnarayan. The other one, Amta channel carries discharge during high floods and outfalls into Hooghly.

11) Dwarkaswar-Silabati-Rupnarayan :- The lower tidal reach below the confluence of Dwarkeswar and Silabati is known as Rupnarayan. After receiving the main flow of Danodar through Mundeswari and a branch of Kangsabati i.e. Old Cossye of Palaspai Khal, it ultimately outfalls into Hooghly. The river is tidal throughout its entire course.

Dwarkaswar rises from the highlands of Purulia district. River Gandheswari rising from Bankura district meets Dwarkeswar 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 Joypana and after traversing through Midnapore district, it meets Dwarkeswar.

12) Kangsabati-Kaliachai-Taldi :-

River Kangsabati in Burulia District is joined by Kumari in Bankura District. Further down, it is joined by the combined stream of Bhairab Ranki and Tarofeni rivers and thereafter flows on through the Midnapore District. After a tortuous course, it bifurcates, the upper branch known as Old Cossye or Palaspai Khal Outfalls into Rupnarayan.

River Kalaighai 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 Kossye to from Haldi which falls into Hooghly.

13) Rasulpur :- It is a river of Contai Sub-Division Midnapore District formed by the three streams Bagda, Sarpai, 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 South 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 Sunderbans and form an intricate network with a number of criss-cross into connecting channels, thus rivers were originally spill channels of Ganga. But gradually their offtakes from Ganga have deteriorated and in some cases being cut-off from the parent river. Now these rivers drain off whatsoever fresh discharge comes country side, thus

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 Barata of Muriganga or Channel Creek, Saptamukhi, Thakuran, Matla, Gosa, Hariabhangra, Raimangal 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.

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 Chatanagpur range at an elevation of 609m. It drains a total areas of 18,951 Km² (13,950 Km²) in Bihar, 2160 Km² in West Bengal and 3201 Km² in Orissa). The main tributaries of the river are Kanchi and Kharkai above Chandil in Bihar, Khakhai in Bihar and Orissa and Dolong in West Bengal.

3. 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 annual rainfall during the four months period, June to September. During the last seventy five years the dates of onset of monsoon over West Bengal was spread between last week of May to last week of June and those 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 homogenous 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, September and July in that order.

On the basis of rainfall distribution, the State can be sub-divided into two broad Zones.

- 1) The Himalayan and Sub-Himalayan Region.
- 2) The Gangetic Plains.

contd...p/13

The Himalayan and Sub-Himalayan regions comprising districts of Darjeeling, Jalpaiguri, Cooch-Bihar and Northern part of Islampur Sub-Division of West Dinajpur district of high incidence of rainfall from 200 Cm. to over 400 cm, about 80% of which is found to occur during the monsoon season for June to September. On the average Darjeeling, Cooch-Bihar and Jalpaiguri get 114.112 and 110 rainy days respectively in a year. The monsoon generally follow, a northerly track 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 m.m. in 2 hours is not unusual while in more than forty occasions of rainfall of 250mm 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 rainfall :-

- SECTOR-I.** Comprising the districts of Bankura, Birbhum, Murshidabad and Burdwan which receive an average rainfall between 1140mm and 1400 mm.
- SECTOR-II** Consisting of the districts of Nadia, Hooghly, Western portion of West Dinajpur, Midnapur and North 24-Parganas having an average annual rainfall between 1650 mm and 1900 mm.

Such regional variations in the precipitation patterns causes flood condition from time to time.

The rainfall data as collected from Indian Meteorological Department for the districts is shown in ANNEXURE-I.

3.1 PREAMBLE

The Year 1994 happened to be an year of non much appreciable flooding. An area of only Sq.Kms was inundated during the year, The Jalangi Bazar area in the district of Murshidabad was the worst hit being the victim of onslaughts of Padma furies. Erosion was caused in Maldah, Cooch-Bihar Districts as well and some embankments were damaged in Midnapore, Birbhum, districts.

The main features of Long Range Forecast of South-West monsoon, 1994 issued by the India Meteorological Department (I. M. D.) on 26. 5. 94 were the following :-

(i) ~~Indian~~ rainfall during the 1994 monsoon will be normal. Thus India is heading for the seventy normal monsoon in a row.

(ii) Rainfall for the country as a whole for the Southwest monsoon (June to September) is likely to be about 92% of its long period average value within an error limit of 4%.

The hytal scenario of the two of the meteorological sub-divisions viz. Sub-Himalayan West Bengal and Gangetic West Bengal proved to be deviated from the meteorological forecast. Rainfall was more or less scanty, the North Bengal districts received much less rainfall in comparison to Normal average rarely seen the past. Barring Sriniketan and Krishnanagar, the other stations received less precipitation. Particulars of of rainfall at different IMD stations and departure thereof are furnished in the following table (monsoon months only)

| Stations | Lts. | Rainfall in mm from 1.6.94 to 30. 9. 94 | Departure |
|--------------------|--------------------|---|-----------|
| 1. Cooch-Bihar | Cooch-Bihar | 1624 | -1110 |
| 2. Jalpaiguri | Jalpaiguri | 1615 | -1041 |
| 3. Maldah | Maldah | 764 | - 318 |
| 4. Berhampore | Murshidabad | 876 | - 162 |
| 5. Sriniketan | Birbhum | 1309 | - 392 |
| 6. Krishnanagar | Nadia | 1317 | + 294 |
| 7. Calcutta | | 1192 | - 14 |
| 8. Diamond Harbour | 24-Parganas(South) | 1076 | - 210 |
| 9. Uluberia | Howrah | 1184 | - 44 |
| 10. Midnapore | Midnapore | 1381 | + 244 |
| 11. Bankura | Bankura | 1182 | + 103 |
| 12. Purulia | Purulia | 1133 | + 77 |

South West monsoon reached West Bengal coast during the second week of June. It was vigorous on 28th June in Gangetic West Bengal when Durgachak, Harinkhola and Midnapore recorded 160, 120 and 114mm of rainfall during 24 hours.

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Consequent upon formation of a low pressure over North Bay of Bengal, south-West monsoon was active over Gangetic West Bengal. Mukutmanipur recorded 137mm, Uluberia 135mm, Contai 65mm on 3. 7. 94 during 24 Hours.

Severity of monsoon on 15. 8. 94 resulted in heavy downpour all over the State. The North Bengal districts which were having rainfall much below their averages also recorded heavy downpour. While Jalpaiguri, Siliguri and Cooch-Bihar recorded 140, 120 and 90mm. Suri and Calcutta recorded 60mm each.

These were some of the synoptic features of the rainfall behaviour during 1994.

During first week of July, river Torsa was eroding vigorously its left bank in P.S. Kotwali district Cooch-Bihar. Consequent upon heavy discharge from Baidara barrage, a 50 metre breach occurred on the newly constructed embankment on the left bank of river Brahmani district Birbhum resulting in inundation of some villages.

A flooded of high magnitude passed through river Cossye in Midnapore district from 9. 7. 94 to 1. 8. 94 following release to the tune of 1700 cumecs (60,000 cusecs) from Kangsabati Dam due to heavy precipitation in the catchment area of the river. The rivers in Midnapore district were swelling. Most of the rivers crossed their Extreme Warning Stage. Old Cossye at Kalmijole surpassed the previous record. Due to the passage of this flood, overtopping, slips and breaches were caused to a number of embankment the worst effected was TE₂ H₂ embankment, where a breach of 137 metre resulted.

The flood situation in the State took its worst turn since 15. 9. 94 at Jalangi Bazar, district murshidabad. Severe erosion occurred on the Char land of river Padma. The total length of erosion was 2.5 Kms. engulfing the Police Station buildings, quarters and a number of existing buildings. A great damage was inflicted upon connecting road, standing crops and other public utilities.

Severe erosion also resulted on the left bank of Ganga in B.S. Kaliachak, Manikchak in the district of Maldah.

Barinā some erosion and imposition of occasional danger signals, the North Bengal districts were almost immune from flood during flood, the monsoon rainfall was appreciably below the average, not noticed during the few decades.

3.2 FLOOD LEVELS OF WEST BENGAL RIVERS DURING 1994

Vide Annexures

3.3 FLOOD SITUATION

The districtwise flood situation in the State is enumerated in the following paragraphs.

A. Districts Darjeeling, Jalpaiguri & Cooch-Bihar.

The main rivers flowing through this Northern part of the State are Mahananda, Teesta, Jaldhaka, Torsa, Kaljani, Raidak and Sankosh while notable important tributaries are Lish, Ghish, Chel, Karala, Murti, Diana, Mujnai, Turturi, Garam, Dima, Balason, Mechi, Lachka, etc. The main problems of all these rivers are viz. (i) Soil erosion (ii) Widening of river to make up the waterways due to deposition of silt and detritus in river bed, (iii) Change of river course and some time avulsion of main river through the tributaries, (iv) bank erosion, (v) Spill over the bank resulting in flooding and sand deposition in agricultural land.

All these problems were there this year also but in very moderate form and did not result much damage.

As already been stated, the North Bengal districts received much less rainfall during this year vis-a-vis the normal ones. Cooch-Bihar, Jalpaiguri, Darjeeling, Maldah and Balurghat departed to the extent of 40%, 29%, 23%, 28% and 36% respectively below the normal averages.

River Torsa was eroding vigorously its left bank on the upstream of M.G. Railway Bridge at Harincherchar, P.S. Kotwali, district-Cooch-Bihar during the first week of July.

B. Uttar Dinajpur and Dakshin Dinajpur districts

Most of the rivers in the district originate from Bangladesh and after flowing through for certain stretches re-enter into Bangladesh. The rivers like Kulik, Nagar, Chiramati, Tangon, & Punarbhaba have their outfalls into the river Mahananda, which outfalls into Ganga on its left bank of Godagarighat in Bangladesh. The river Atrai however outfalls into Brahmaputra.

The uncontrolled high discharge from the individual catchments combined with local rainfall causes flood in these rivers inundating the district by spilling. The inundation in P.S. Hilli is due to the flooding of the rivers Cheri, Ghagra, Jamuna and ingress of flood water from Bangladesh.

contd....p/4

2 This year however, the flood situation in the district did not arise and there was no inundation. However, some damages to Engineering structures, sluices, embankments and protective works occurred at places.

C. District Maldah :-

The district has a topography having scattered low area with dense population and intensive cultivation, slight excess rainfall over average may cause flooding here. Spilling from rivers flowing in the district results in tremendous ~~ms~~ hazards accompanied with drainage congestion.

The main rivers in this district are Mahananda, Ganga, Fulahar, Kalindri and Punarbhaba. The district is bounded by Ganga in the South, Fulahar and Mahananda on the north-west and Punarbhaba on the east, other rivers like Pagla, Srimati Tangon etc. traverse only through a small tract of the district. The discharge through these river synchronised with the upland flow through Ganga worsens the flood situation of the district.

This year too, river Ganga and Fulahar were ruling high, crossed their respective warning stages and danger signals had to be issued a number of times. Due to passage of this flood, the river Ganga continued its leftward tendency and the deep channel hugged towards the toe line of the marginal embankment at several places resulting in breach of the same at Kadamtala village. The spur nos. 10, 18, 20, 14 were seriously threatened and much damages were inflicted from them. The spur no. 25 was the worst affected being totally outflanked.

D. District Murshidabad :-

The major rivers in the district are Dwarka, Brahmani, Mayurakshi, Kuye, Bansloi, all of which originate from Chottanagpur hills in the district of Santhal Parganas, Bihar and after traversing through the districts of Birbhum and Murshidabad outfall into the river Bhagirathi. Consequent upon synchronising of flow of these rivers flood results in Murshidabad district, Particularly when Bhagirathi rules high. As a result, vast tract of land in Kandi, Bharatpur, Khargram, Beldanga, areas is subject to inundation. On the other hand, due to high flood of river Ganga-Bhagirathi system, a major area in P.S. Farakka Samserganj, Suti, Raghunathganj, Lajgola, Bhagabangola and Raninagar suffers inundation, drainage congestion Erosion of Ganga, Padma is a major problems in the district.

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The situation at Jalangi Bazar in the district took a serious turn since 15. 9. 94. The river hugged the right bank of river Padma and wrought severe erosion on the char land of the river. The highly populated Jalangi Bazar area was the victim of the onslaughts of such Padma furies. The school building, the major portion of the thana, Kalimandir, Sibmandir, 350 nos. of pucca buildings and 125 nos Kutcha houses were washed away. The pucca road connecting Berhampore and Karimpore was severely attacked.

The metalled portion of the road cracked down for a length of about 9 metres and width of 1.25 metres. The total length of erosion was 2.5 Kms and width being about 120 metres.

Due to sudden rush of water and release of high discharge down Baidara Barrage an area of 13 Sq.Km was inundated in P. S. Khargram.

E. DISTRICT BIRBHUM :

There was no appreciable flood in the district during the year. However consequent upon heavy discharge down Besides barrage, a 50 metre long breach occurred on the newly constructed Brahmani embankment resulting in inundation of Villages Digha, Kelli, Sonigram, Donigram, Jhilyhili, Bhuskal in P.S. Khargram on 5. 7. 94. Minor Damages due to erosion occurred to a number of embankments, Particularly Kuye Right Embankment. A number of Canal structures under Mayurakshi Reservoir Project were damaged.

F. District Burdwan ..

The district Burdwan was not much affected due to flood during this year. However, as a result due to heavy rainfall from 31.7.94 to 2.8.94, some low lying areas on both banks of river Banka was inundated.

District : Bankura :-

The Right Bank Main Canal of D. V. & B.I. System breached for a length of 30 metres on 21. 8. 94 at ch.1259 at Village Boroboudi, P. S. Patrasayar, District- Bankura.

G. District- Nadia :

The topography of the district has some scattered low lying having large number of population and intensive cultivation as well. Spilling of rivers like Jalangi, Churni, Bhagirathi creates flood hazards associated with darinage congestion. The district experienced some acute flood problems during this year. Bhagirathi. Jalangi crossed Danger Levels at Swarupgunge and the stage was maintained for a good number of days. The duration of flood on each occasion lasted for 4 to 5 days. An unprotected area of 2.25 Sq.Km. near Ma yapur and Frachin Mayapur had suffered from

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flood hazards due to spilling of Bhagirathi and Jalangi. Quite more, severe bank erosion was observed near Ghasusidanga, Juranpur, Sorakhali, Faridpur, Tarapur, Gouranga Setu, Boralghat at Nabadwip, Charbishnupur, Durlavpur, Frachin Mayapur. Existing bank protective works also suffered.

H. District : Midnapore :-

Due to heavy rainfall during the last week of June, the Water levels in the district of Midnapore were rising. River Kaliaghye crossed danger level at Amgachia and crossed extreme danger level at Dehati on 29. 6. 94. River Kapaleswari was also rising. The rivers however showed receding trend subsequently.

Consequent upon heavy rainfall during the last week of July in the catchment of river Kangsabati, a quantum of 1700 cumecs (60,000 cusecs) was released from Kangsabati dam. This caused the rising of river stages in Midnapore district. Old Cossye at Kalmjore recorded maximum level of 10.97M on 1. 8. 94 surpassing the previous record of 10.88M

As a result of such high ruling of the river, a breach of 137 metres length occurred to TE2H2 embankment in between 3 KM to 4 KM on the right bank of river Old Cossye, opposite to Narajole Ex-Zemindary Embankment at mouza Bhabanipur in P.S. Debra on 1. 8. 94. Before breaching the embankment, the water level had crossed the ever recorded water level of 17.80M at Kapastikri. Apart from the Dussaspur circuit, Mohankhali, circuit, Chetua circuit and Durbachatty embankment were damaged at places.

I. District Hooghly :-

Due to the release of a high quantum of discharge down Durgapur Barrage on 1. 7. 94 for a duration of 6 hours, the low lying areas of P.S. Khannakul in Hooghly district were inundated. About 10 villages suffered from inundation during this spell.

J. District-Havrah :-

Consequent upon high release of discharge down Durgapur Barrage, extensive erosion was noticed at Charkantapukuria. There were several slips on the Damodar Left Embankment. River Damodar crossed Danger Level at Amta on 2. 8. 94.

K. District South 24-Parganas :-

Due to prevalent high perigeon tides during September, 1994, the Sundarbans embankments in the coastal areas of the south 24 Parganas district were severely damaged at various vulnerable places along different rivers. The high rise of water level accompanied with strong & gusty winds brought about enormous damages to the pitching and revetment works.

A N N E X U R E - I.

Rainfall in MM

RAINFALL DATA IN THE DISTRICT OF WEST BENGAL DURING 1994

| Name of the District. | From 1. 1. 94 to 31.5.94 | | From 1.1.94 to 15.10.94 | | From 1.1.94 to 15.10.94 | | Percentage Departure on 15.10.94 |
|------------------------|--------------------------|--------|-------------------------|--------|-------------------------|--------|----------------------------------|
| | Actual | Normal | Actual | Normal | Actual | Normal | |
| Cooch-Behar | 769.10 | 635.10 | 1348.4 | 2890.9 | 2117.5 | 3526.0 | -40 |
| Jalpaiguri | 423.4 | 469.9 | 1853.1 | 2765.9 | 2276.5 | 3225.8 | -29 |
| Darjeeling | 271.0 | 364.8 | 1794.8 | 2320.1 | 2065.8 | 2694.9 | -23 |
| Malda | 108.8 | 186.8 | 865.1 | 1161.9 | 973.9 | 1348.7 | -28 |
| Balurghat (S.Dinajpur) | 79.2 | 75.8 | 679.0 | 1114.4 | 758.2 | 1190.2 | -36 |
| Raiganj (N.Dinajpur) | | | | | | | |
| Murshidabad | 211.5 | 210.7 | 936.1 | 1112.0 | 1147.6 | 1322.7 | -13 |
| Birbhum | 198.6 | 148.7 | 1241.0 | 182.7 | 1439.6 | 1131.4 | 27 |
| Radia | 434.2 | 260.1 | 1259.1 | 1110.4 | 1693.3 | 1370.5 | 23 |
| Burdwan | 193.7 | 194.8 | 1029.5 | 1109.1 | 1223.2 | 1303.9 | -06 |
| Bankura | 257.4 | 175.3 | 1233.0 | 1069.5 | 1490.4 | 1244.8 | 20 |
| Burulia | 185.4 | 114.3 | 1242.2 | 1099.0 | 1427.6 | 1213.3 | 18 |
| Midnapore | 252.0 | 214.7 | 1384.4 | 1194.3 | 1636.4 | 1409.0 | 16 |
| Hooghly | 268.9 | 180.5 | 978.6 | 1243.5 | 1247.5 | 1424.0 | -12 |
| Barah | 252.4 | 278.7 | 1072.4 | 1318.8 | 1324.8 | 1557.5 | -17 |
| Parganas(S) | 292.5 | 233.7 | 1332.6 | 1355.2 | 1625.1 | 1588.9 | 02 |
| -Parganas(N) | 284.3 | 180.5 | 1371.6 | 1243.5 | 1655.9 | 1424.0 | 16 |

Source : Indian Meteorological Department, Alipore, Calcutta-700 027.

FLOOD LEVELS OF WEST BENGAL

RIVERS DURING 1986

All levels in Metre

(NORTH BENGAL RIVERS IN TERMS OF SIGNAL IMPOSITION)

W. L. :- Water Level
 U. A. :- Unprotected Area
 P. A. :- Protected Area
 H.W.L. :- Highest Water Level.

| Serial No. | Name of river with Gauge | District. | Y.S. | | R.S. | | Date & Time | Wl(m) | Remarks |
|------------|--------------------------|-------------|-------|-------|-------|-------|---------------------|-------|----------------|
| (1) | (2) | (3) | U.A. | P.A. | U.S. | P.A. | 8. | 9. | 10. |
| 1. | Teesta at Domohani | Jalpaiguri. | 85.30 | 85.60 | 85.80 | 86.30 | 10.00 hrs on 20.6. | 85.55 | Y.S for U.A. |
| | | | | | | | 0.20 hrs on 24.6 | 85.56 | Max. Level. |
| | | | | | | | 8.30 hours on 26.6 | -- | Y.S.withdrawn. |
| | | | | | | | 10.00 hours on 1.7. | 85.62 | Y.S for U.A. |
| | | | | | | | 10.00 hours on 8.7. | 85.29 | Y.S.withdrawn. |

FLOOD LEVELS OF WEST BENGAL

(NORTH BENGAL RIVERS IN JUNE 1971)

1971

WATER LEVEL : WATER LEVEL

DANGER LEVEL : DANGER LEVEL

EXTREME DANGER LEVEL : E. D. L.

H.W.L. - HIGHEST WATER LEVEL

| Serial No. | Name of River. | Gauge at | District | D.L. | E.D.L. | Date & Time | W.L. | Remarks |
|------------|----------------|--------------------|------------|--------|--------|--|----------------|------------|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 1. | Teesta | Coronation Bridge | Darjeeling | 149.40 | 150.80 | 6.00 hours on 15.8 | 148.60 | HWL |
| 2. | Jaldhaka | NH-31 crossing | Jalpaiguri | 80.00 | 80.50 | 10.00 hours on 29.7 | 79.93 | HWL |
| 3. | Torsa | Hasimara Rly. Brg. | | 116.30 | 116.90 | 9.00 hours on 29.7 | 115.45 | HWL |
| 4. | Mansai | Mathabhanga | | 48.20 | 48.70 | 10.00 hours on 15.8 | 48.20 | HWL |
| 5. | Raidak-I | L.R.P. crossing | | 46.70 | 47.60 | 9.00 hours on 26.7 | 46.45 | HWL |
| 6. | Raidak-II | L.R.P. crossing | | 48.10 | 49.00 | 9.00 hours on 29.6 9.00 hours on 26.7 | 46.55 46.55 | HWL HWL |
| 7. | Sankosh | L.R.P. crossing | | 48.20 | 49.10 | 9.00 hours on 30.6 | 47.00 | HWL |
| 8. | Kalja ni | Alipurduar | | 45.10 | 45.70 | 9.00 hours on 26.9 | 42.95 | HWL |
| 9. | Diana | Chengmari | | 200.50 | 201.40 | 9.00 hours on 10.8. | 199.25 | HWL |