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Hydrological Problems of Flat Lands, Estuaries and Marshes in West Bengal

By

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HYDROLOGICAL PROBLEMS OF FLAT LANDS,
ESTUARIES, MARSHES - WEST BENGAL

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1.0 INTRODUCTION

1.1 From hydrological point of view the State (vide map attached) can be divided into four distinct parts:

- (1) Northern part consisting of 3 districts namely Darjeeling, Koch-Bihar, Jalpaiguri which together constitute the Terai and Dooars area. The rainfall in a year remains more than 2000 mm with considerable spatial variations. Meteorologically this comes under Sub-Himalayan West Bengal. Excepting a portion of Darjeeling district, the entire area comes under Brahmaputra river basin.
- (2) Central part is constituted with West Dinajpur, Malda, Murshidabad, Nadia, Birbhum, Bardhaman, Midnapur (N), Bankura, Purulia. The annual rainfall varies from 1600 mm in West Dinajpur to 1300 mm in Purulia. This part comes under Ganga basin.
- (3) Southern part with 24 Parganas (N), Hughly, Howrah and part of Midnapur (S) comes under Ganga basin. A part of Midnapur (N) and Midnapur (S) comes under Subarnarekha basin. Rainfall is of the order of 1400 mm.
- (4) Part of Midnapur district (S) and 24 Parganas (S) essentially consists of low flat land interspersed by tidal creeks. This part is normally reckoned under Ganga basin. Rainfall is of the order of 1600 mm.

2.0 DRAINAGE SYSTEM

2.1 The principal drainage arteries in part 1 are Sankosh-Raidak-Torsa system, Jaldhaka, Tista and Mahananda.

2.2 The main drainage arteries in the central part and southern part is Ganga-Bhagirathi-Hughly system with a network of its

tributaries mainly, Mayurakshi, Ajoy, Damodar, Kangsabati, Rupnarayan, Haldi etc. on West and Bhairab-Jalangi, Mathabhanga-Churni-Icchamati system on East. Running on the western boundary of the State, the Subarnarekha river conveys the drainage of part of Purulia district and part of Midnapur district (N & S).

2.3 Several tidal rivers take care of drainage of areas which fall under category 4 above. The notable among them are Pichabhanga, Rasulpur, Haldi, which join the western bank of river Hughly. The drainage of Calcutta city and part of 24-Parganas (N) is made through Kultigong-Raimangal system of estuaries. The extreme south eastern part of the State is drained through Peali-Matla system of estuaries. The estuaries on the western side of Hughly are shallow while those on the eastern part are deep.

3.0 PROBLEM OF DRAINAGE

3.1. The entire gangetic delta from sea-coast upto Farakka, consisting of areas indicated in part 2,3 and 4, has been a victim of premature reclamation of land for human activities and development of land through natural process of delta formation by rivers and creeks has been denied by constructing embankments. In the lower tidal reaches, the erstwhile zamindars put up an aggregate of 4000 kms of embankments which have developed with the State Government since abolition of zamindars in 1955.

3.2 The embankments on rivers like Bhagirathi, Damodar, Kasai, Ajoy, Haldi, Tista were also constructed at places by Government on one bank protecting important towns, roads and other civic amenities leaving the other bank to develop with time from flood spill.

3.3 There is a wide fluctuation in the range of discharges carried by the rivers during 7 non-monsoon months and five monsoon months. For Ganga this is 54 and for others varying in different scale. This has an inherent impact on the river morphology in lower alluvial/deltaic region where bank erosion and meandering are pronounced.

3.4 The problem gets compounded with high rainfall rate exceeding even 500 mm in one day coupled with storm-cyclone and high tide conditions coinciding in worst situations.

3.5 Almost in all the cases the problem of drainage is more active in the lower reaches of the river mainly due to flatter

land and river slopes available for drainage in such reaches. The lands in this reach of the rivers have low elevation and subject to spilling.

4.0 TYPICAL PROBLEM AREAS

4.1 The area surrounded by Kaliaghyee, Kasai (New), Haldi and Khirai-Buxi, is known as Moyna basin in Midnapur district. The drainage from this basin with an area of 124 sq.kms., becomes impossible during monsoon season.

4.2 Kandi area in Murshidabad district is low lying flat lands and surrounded by rivers like Mayurakshi, Dwaraka-Brahmani, Kuye. These rivers drain into Bhagirathi, whose bed has risen over last century causing problem of drainage in Kandi area.

4.3 Ghatal area of Midnapur, is another such example, which gets affected from floods of surrounding rivers like Kasai (old), Silabati, Dwarakeswar and Rupnarayan.,

4.4 Apart from these problems area, considerable low lying areas (locally known as Beel) in central part and southern part, constitute sizable water bodies which help in reduction of flood peaks and retaining water thereby improve the ground water regime in the area, though present trend is to reclaim these beels. Notable among these beels are, Hijal beel and Telkar beel in Murshidabad District, Lakshmipur beel in Malda District, Barti beel in 24 Parganas (N) District, Kendua beel in Howrah District, Basudha Barun beel in Bardhaman district.

5.0 INVESTIGATION NECESSARY

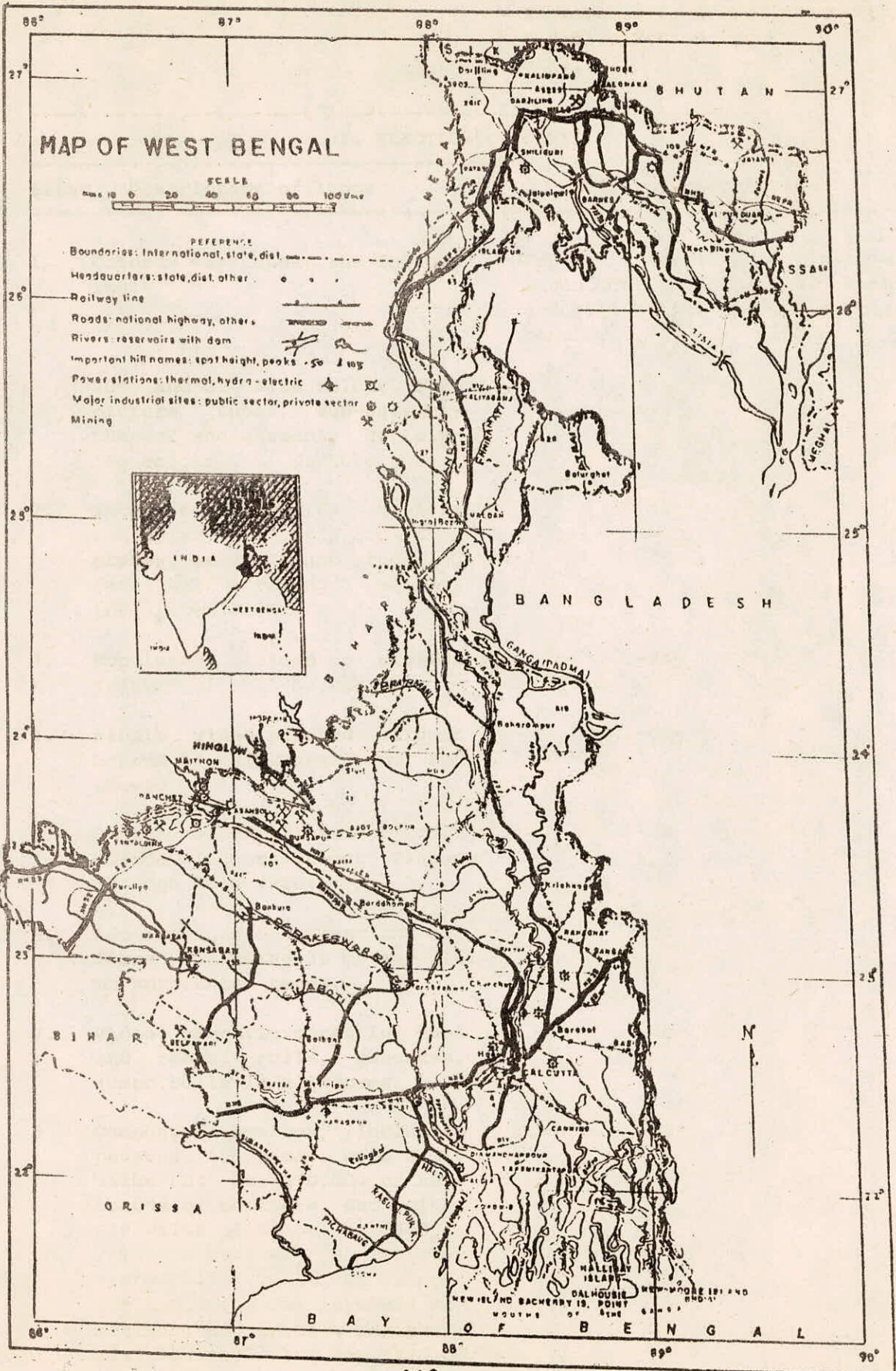
5.1 The following investigations are necessary to appreciate the problem of flat and marshy lands. The analysis and results obtained from data thus collected will lead to adopt corrective measures to minimise human sufferings and accelerated economic development:

1. Rainfall vs inundation
2. Drainage characteristics of terrain of flat land soil
3. Low lying area surrounded by highlands consequent seepage influx
4. Impact of rainfall-drainage on chemical properties like salinity, alkalinity etc, in soil.

5. Organic decaying due to standing water
6. Green house gases measurement technique in flat and marshy land
7. Thermal imbalance - application of infrared spectrum
8. Degree of wetness from Remote Sensing Picture
9. Reclamation of lands in coastal area including leaching time

6.0 CONCLUSIONS

6.1 A systematic collection of data from all angles like engineering, soil and other scientific as well as socio-economic data form basic inputs for planning for useful and economical utilisation of natural water body. Present conflict, in West Bengal, between maintaining statusque of water body/marshy lands vis-a-vis reclaiming them, will have its proper resolution only when frontier area of knowledge in this direction is opened through systematic collection of data and other investigations as indicated.



MAP OF WEST BENGAL



- REFERENCE
- Boundaries: International, state, dist.
 - Headquarters: state, dist, other
 - Railway line
 - Roads: national highway, other
 - Rivers: reservoirs with dam
 - Important hill names: spot height, peaks
 - Power stations: thermal, hydro-electric
 - Major industrial sites: public sector, private sector
 - Mining



