

POTABLE WATER SCARCITY
Extracting Groundwater or/and Harvesting
Rainwater

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The gross area of southwest coastal Bangladesh is 2562 thousand hectares, where the usable recharge is 5,600 (Mm³) and demand (includes water supply, 289, Environment 620 and Agriculture 4196 Mm³) is 5,105 (Mm³). Balance is 495 (Mm³) or 9% (Resource Assessment by NWP-II; Demand estimated by NEMP; Source: SDP, 2011)

However demand for potable groundwater is assumed to be more in urban conglomerates !! And not satisfying the urban demand for safe water.

Because of the scarcity of safe potable surface water and restricted access the urbanites uses groundwater.

However groundwater is justified as desirable over surface water because:

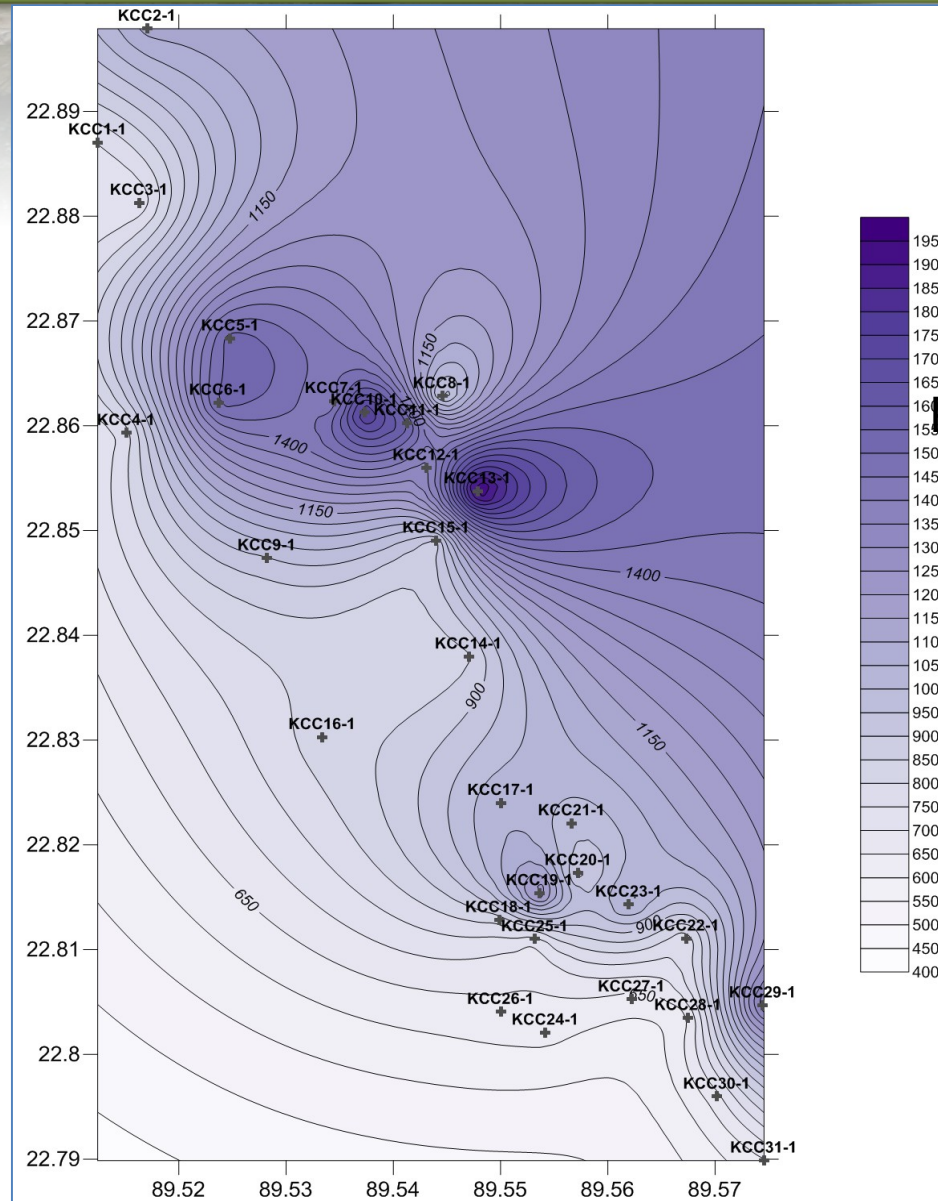
- It is supposed to be pathogen free, and radiochemical and biological contamination is difficult

- Having a relatively constant temperature and chemical composition

- Generally not having turbidity and colour

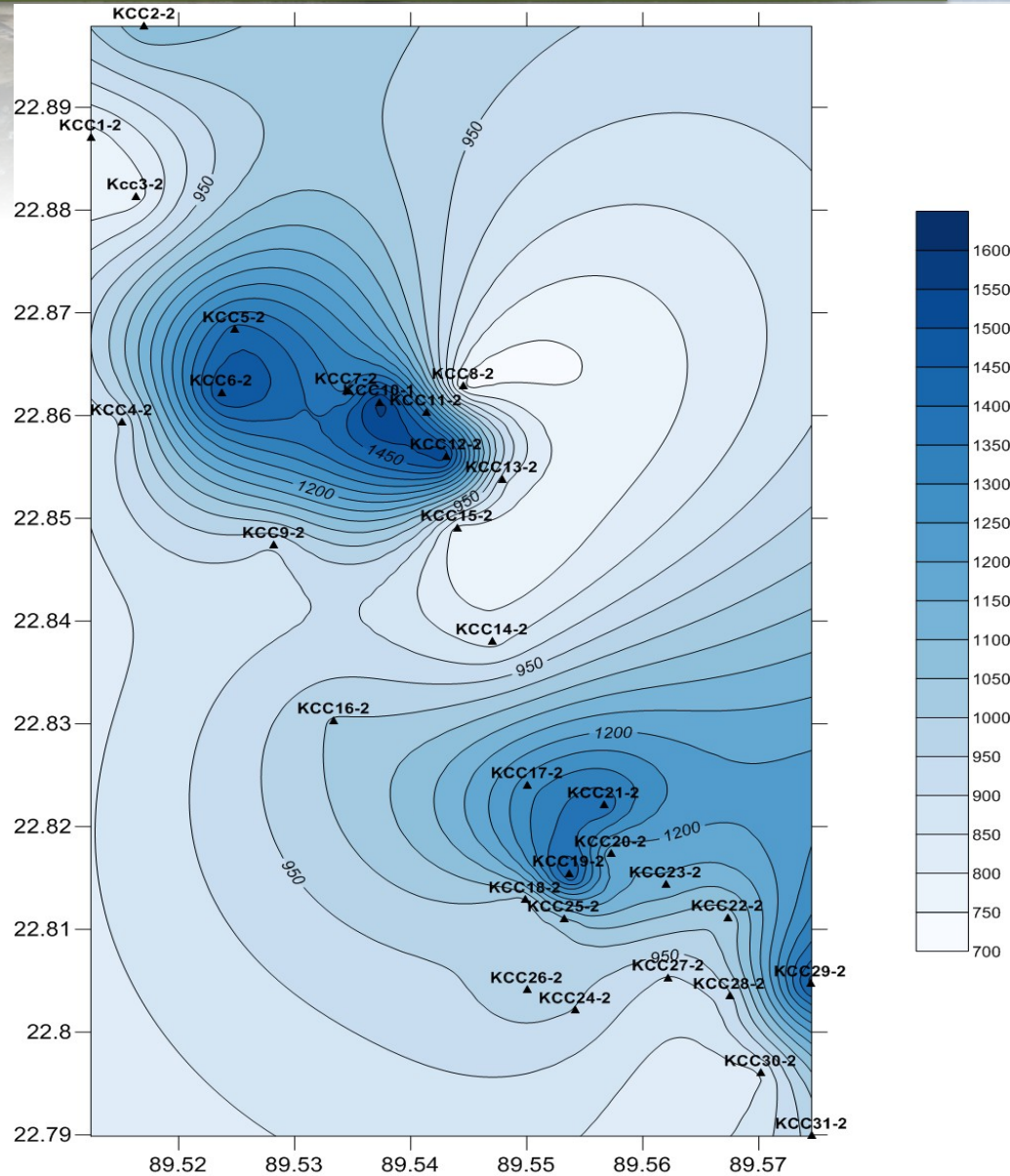
- Groundwater storage is generally known and larger, and available where surface water is not dependable.

GROUND WATER SOURCE IS FEASIBLE?



Plot of TDS (Monsoon)





Plot of TDS
over KCC
(Winter)





- Since ground water has failed to meet the quality demand of KCC and the adjoining areas, we need to turn to either surface water or rainwater harvesting.
- The *concept* of rainwater harvesting becoming restricted to building roofs and shades !
- Abandoned channels in and around coastal cities may be good options for rainwater harvesting.
- For example *Mayur* for KCC could be an option for rainwater reservoir to meet the demand of safe potable water for KCC and the adjoining areas





The Mayur: catchment



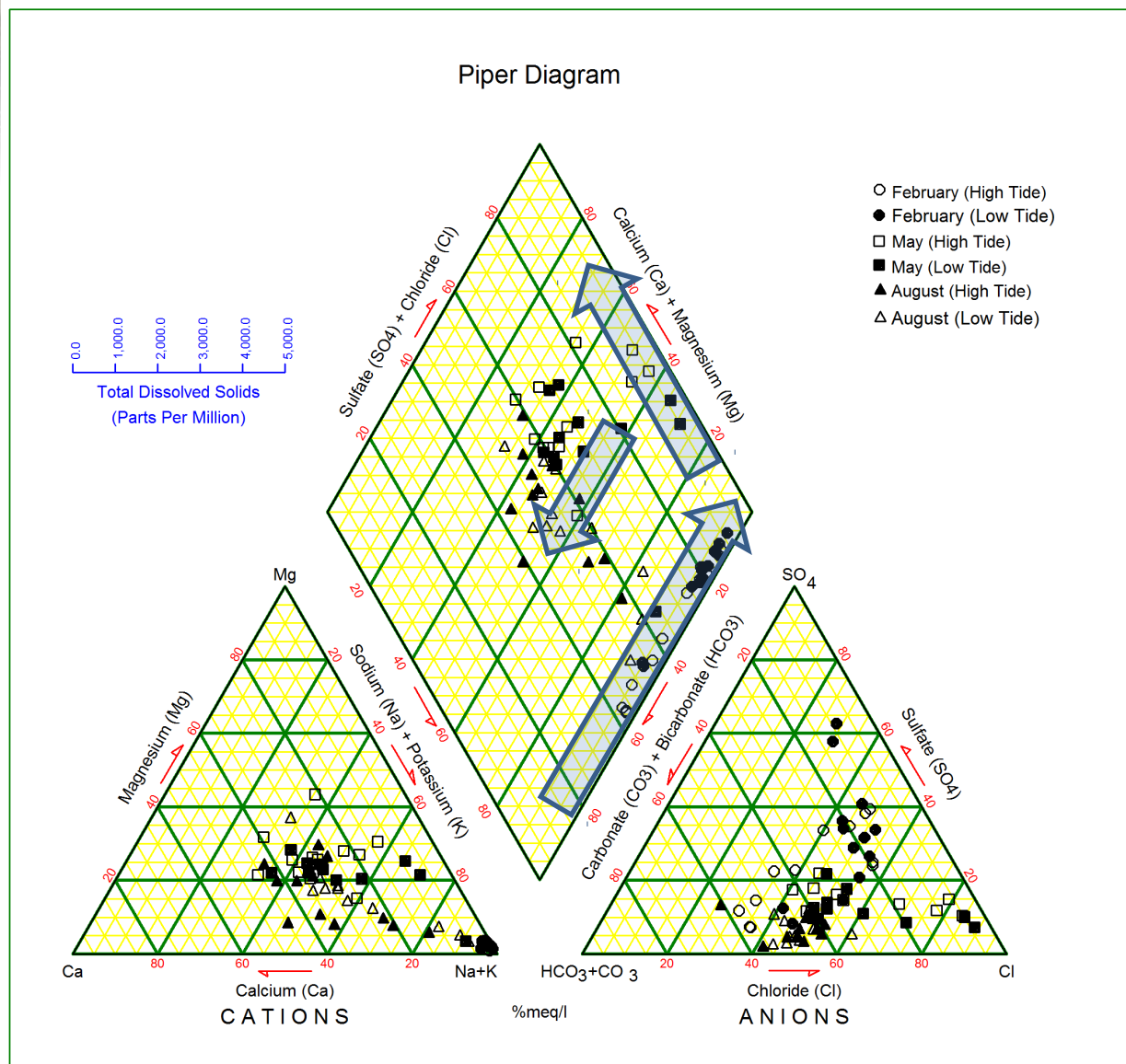
The Mayur: Sneak picks

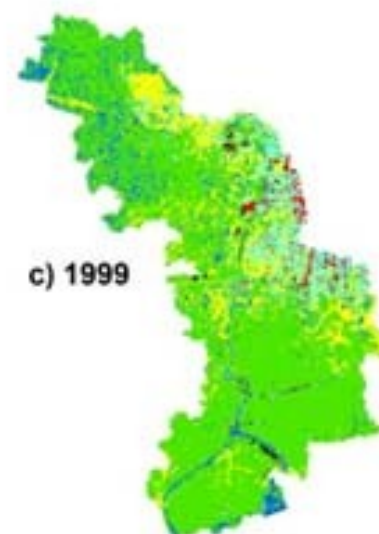
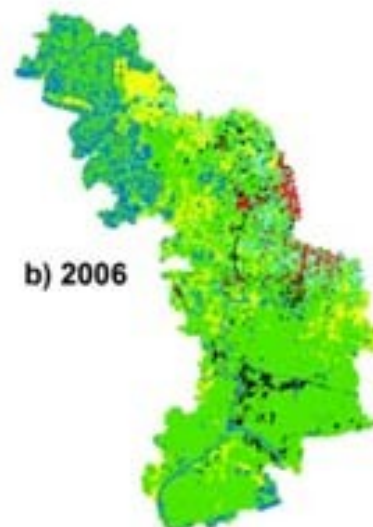
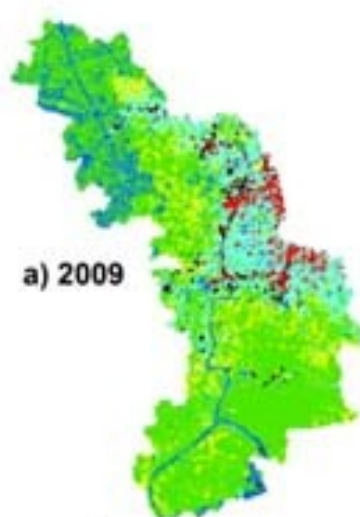
- Length: 11.69 kilometers
- Average Channel Width: ~ 12 m- 80 m
- Tributaries: 6
- Distributaries: 2
- City drains : 17 to 22
- Major land use types: Dominated by agriculture followed by wetlands and urban areas
- Sinuosity : 1.37
- Water reserve capacity: 725732265 us gallon (natural)
556542824 us gallon (present state) [1m³ = 264 us gallon]



Hydro-chemistry

Water
quality
improves
during
monsoon





Legend

- Agriculture
- Low settlements
- Medium settlements
- High settlements
- Waterbody
- Others

0 2 4 8 km



Such Reservoirs provides at least:

Potable water security

Ecological services (expand and include esthetics and entertainment)

Supplemental to city water supply system

Mayur: waste dumping



Direct disposal of household waste made the natural water flow blocked



Mayur: waste dumping



Toilet lines directly disposing waste to the Mayur

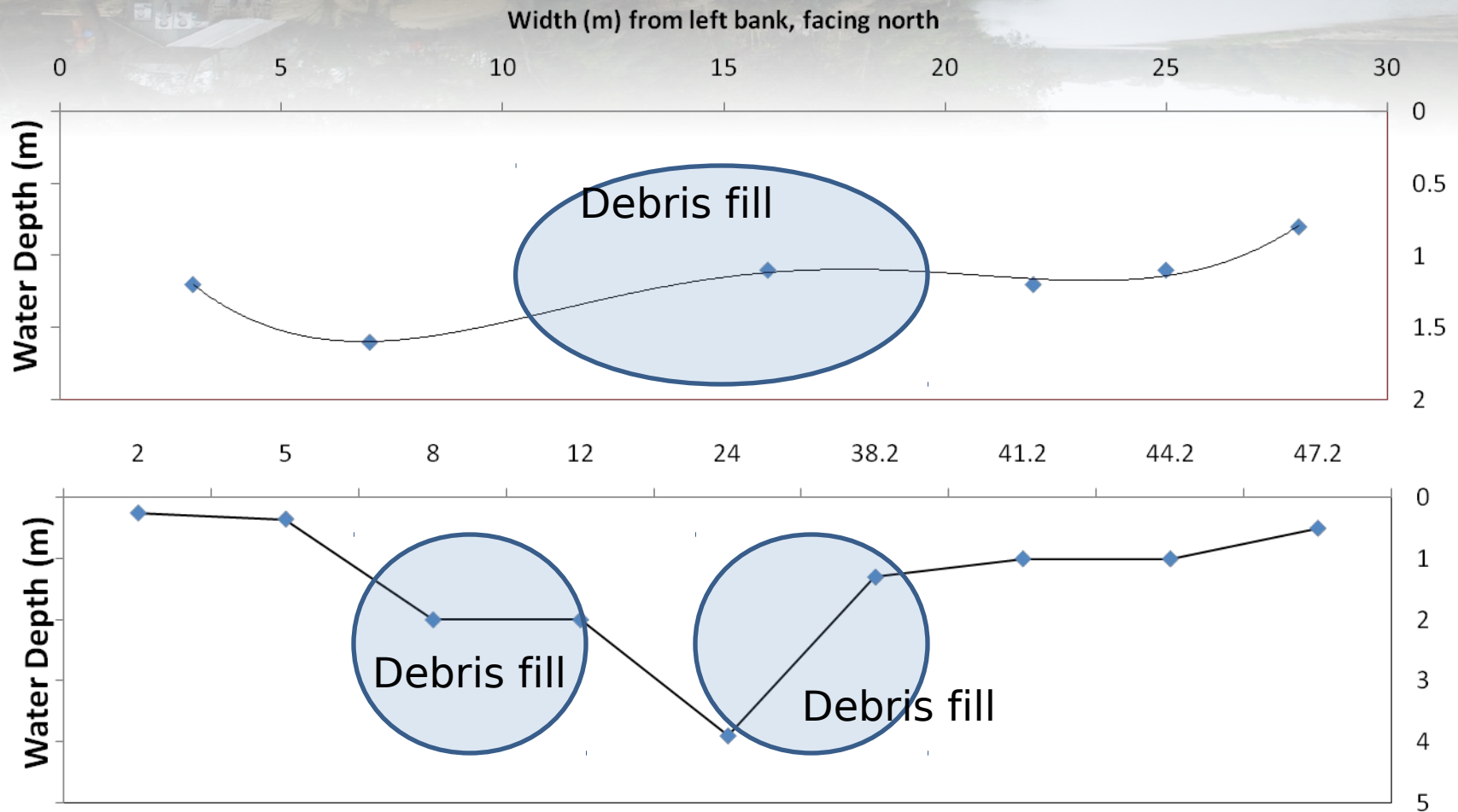
Mayur: waste dumping



Dead cow-
disposed to the
river floating from
upstream to
downstream
creating organic
pollution on the
way



Mayur: river profile and debris



Two upstream Cross-sections of the Mayur

Mayur: communities and conflicts

- Four types of water user groups (directly dependent on Mayur):
 - Households (95% of total households)
 - Farmers (60% of total farmers)
 - Fishermen (60% of total fishermen)
 - Communities disposing waste to Mayur (52% of total riverside communities)



Mayur: overall

- Mayur's **water quality improves with water availability**
- When flushed with fresh water, Mayur water is usable for agriculture
- **Ground water quality is still alright** alongside the Mayur
- Mayur receives **more than 80% of the city waste water**, still water availability can control the rate of pollution
- Mayur **needs an immediate excavation** of debris which is causing overflow of water and flooding many nearby areas
- Given the wet season water quality, **biological treatment is sufficient** for pollution control in Mayur river



Rainwater harvesting in abandoned channels will provide a institutional platform for:

Surveillance and Quality Control

Management and Protection



That's All!