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Ministry of Housing and Public Works
Urban Development Directorate
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PREPARATION OF DEVELOPMENT PLAN FOR MEHERPUR ZILLA

REPORT ON ASSIGNMENT-05

Assist the Urban Planner in the Preparation of the Structure Plan and Policies, including a report elaborating all the contenting sectors and extents.

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Summary of Assignment 5

A. Summary of Assignment 5

This report summarizes Assignment-5 according to the ToR by Junior Urban Planner (Individual Consultant) for the "Preparation of Development Plan for Meherpur Zilla" project. My assignment is "Assist the Urban Planner in the Preparation of the Structure Plan and Policies, including a report elaborating all the contenting sectors and extents: the water and sanitation challenges in Meherpur, highlighting poor water quality, particularly during the dry season, with high levels of pollution and arsenic contamination in several areas. Current water systems, mainly relying on deep tubewells, do not address these issues effectively. The review of existing policies includes the National Water Policy (1999), Bangladesh Water Act (2013), and Drinking Water Quality Standards (2005), among others, which aim to improve water management, ensure safe drinking water, and address waterborne diseases. These policies provide a framework for managing water resources, improving sanitation, and tackling arsenic contamination, but gaps remain in implementation.

(Nabanita Sarker)

Junior Urban Planner

Access To Pure Drinking Water and Proper Sanitation

Access to clean drinking water and proper sanitation is essential for public health and well-being. In Meherpur district, providing safe water and adequate sanitation facilities is crucial for enhancing residents' quality of life. Despite various efforts, a significant portion of the population still struggles to access these vital services, leading to health problems, particularly in rural areas.

This chapter concentrates on assessing the current state of water and sanitation infrastructure in Meherpur, identifying service delivery gaps, and suggesting practical solutions.

1.1 Existing Situation Analysis

1.1.1 Surface Water Quality of Meherpur

According to the Field Survey report 2025, the Surface water quality of Meherpur was tested over various parameters. Altogether, 12 parameters were tested to gain a comprehensive understanding of the water quality. The parameters were temperature, alkalinity, turbidity, BOD, COD, pH, DO, electrical conductivity, TDS, TSS, chloride, and salinity. To get the seasonal variation, we took data during the dry season and the wet season. In the dry season, water was collected from 22 points, and in the wet season, 12 points were selected for water collection.

Dry Season Water Quality

The dry season table covers 22 locations, reflecting conditions when water bodies experience reduced flow and higher pollutant concentration due to less dilution. Key observations: Temperature: Higher than the wet season, ranging from 23.8°C (Terail) to 32.4°C (Taranagar), reflecting warmer, drier conditions.

pH: Ranges from 6.51 (Kedarganj) to 9.7 (Biswanathpur), with some locations (e.g., Malshadaha, Biswanathpur) showing alkaline conditions (>9), potentially harmful to aquatic life.

Salinity: Remains low (0.01–0.04 ppt), similar to the wet season, indicating consistent freshwater characteristics.

Turbidity: Highly variable, from 12.1 NTU (Kedarganj) to 177 NTU (Taranagar). Taranagar's extremely high turbidity suggests significant sediment or pollution, reducing water clarity.

Dissolved Oxygen (DO): Ranges from 3.4 mg/L (Biswanathpur) to 9 mg/L (Malshadaha). Low DO at Biswanathpur could threaten aquatic life, while most sites are adequate (>5 mg/L).

Total Dissolved Solids (TDS): Varies from 117 mg/L (Ballovpur) to 522 mg/L (Terail), with higher values indicating concentrated dissolved substances due to lower water volumes.

Electrical Conductivity (EC): Ranges from 202 $\mu\text{S}/\text{cm}$ (Taranagar) to 780 $\mu\text{S}/\text{cm}$ (Terail), correlating with TDS and reflecting higher ionic content in the dry season.

Total Alkalinity: Ranges from 110 mg/L (Taranagar) to 420 mg/L (Bondor Muzibnagar Road), showing strong buffering capacity, especially at Bondor.

Total Suspended Solids (TSS): Varies from 4 mg/L (Kedarganj) to 420 mg/L (Taranagar), with Taranagar's high TSS indicating severe sediment or pollution issues.

Chloride: Ranges from <0.5 mg/L (Gopalpur, Kedarganj) to 51.98 mg/L (Harbhanga), generally low but slightly higher than the wet season.

Biological Oxygen Demand (BOD): Ranges from <0.5 mg/L (Gopalpur, Kedarganj) to 20 mg/L (Taranagar), with Taranagar showing significant organic pollution.

Chemical Oxygen Demand (COD): Ranges from 12 mg/L (Mohajonpur) to 200 mg/L (Taranagar), with Taranagar's high COD indicating substantial chemical or organic pollution. The dry season data show more variability and higher pollutant levels, particularly at Taranagar, which has extreme turbidity, TSS, BOD, and COD, indicating severe pollution. Alkaline pH in some areas and low DO at Biswanathpur are additional concerns.

Parameter	Range (Dry Season)	Key Observations
Temperature	23.8°C (Terail) – 32.4°C (Taranagar)	Higher than the wet season, reflecting warmer, drier conditions.
pH	6.51 (Kedarganj) – 9.7 (Biswanathpur)	Some locations (e.g., Malshadaha, Biswanathpur) show alkaline conditions (>9).
Salinity	0.01–0.04 ppt	The level remains low, indicating consistent freshwater conditions.
Turbidity	12.1 NTU (Kedarganj) – 177 NTU (Taranagar)	Taranagar has extremely high turbidity, suggesting sediment/pollution issues.
Dissolved Oxygen (DO)	3.4 mg/L (Biswanathpur) – 9 mg/L (Malshadaha)	Low DO at Biswanathpur could threaten aquatic life, while most sites are adequate.

Total Dissolved Solids (TDS)	117 mg/L (Ballovpur) – 522 mg/L (Terail)	Higher values indicate concentrated dissolved substances due to lower water volumes.
Electrical Conductivity (EC)	202 µS/cm (Taranagar) – 780 µS/cm (Terail)	The data reflect higher ionic content in the dry season, correlating with TDS.
Total Alkalinity	110 mg/L (Taranagar) – 420 mg/L (Bondor Muzibnagar Road)	Strong buffering capacity, especially at Bondor.
Total Suspended Solids (TSS)	4 mg/L (Kedarganj) – 420 mg/L (Taranagar)	High TSS at Taranagar indicates severe sediment or pollution.
Chloride	<0.5 mg/L (Gopalpur, Kedarganj) – 51.98 mg/L (Harbhanga)	The levels are generally low, but slightly higher than in the wet season.
Biological Oxygen Demand (BOD)	<0.5 mg/L (Gopalpur, Kedarganj) – 20 mg/L (Taranagar)	High BOD at Taranagar indicates significant organic pollution.
Chemical Oxygen Demand (COD)	12 mg/L (Mohajonpur) – 200 mg/L (Taranagar)	High COD at Taranagar indicates substantial chemical/organic pollution.

Wet Season Water Quality

The wet season table includes data from 12 locations in Meherpur district, collected during the monsoon period when water bodies are typically replenished by rainfall. Key observations: Temperature Ranges from 25.9°C (Amjhupi Meherpur) to 28.2°C (Taranagar), which is typical for tropical wet seasons, indicating stable thermal conditions.

pH: Varies from 5.9 (Terail) to 7.9 (Harbhanga), with most values near neutral (6.5–7.5), suitable for aquatic life. Terail's slightly acidic pH may indicate organic matter or pollution.

Salinity: Low across all sites (0.01–0.04 ppt), reflecting freshwater dominance typical of the wet season due to dilution from rainfall.

Turbidity: Ranges widely from 7.3 NTU (Harbhanga) to 67.3 NTU (GOR Pond), indicating variable water clarity. High turbidity at GOR Pond suggests sediment or organic matter, potentially impacting aquatic ecosystems.

Dissolved Oxygen (DO): Varies from 4.9 mg/L (GOR Pond) to 7.3 mg/L (Terail), generally within acceptable ranges (>5 mg/L) for aquatic life, though GOR Pond's lower DO could stress organisms.

Total Dissolved Solids (TDS): Ranges from 104 mg/L (Harbhanga) to 398 mg/L (Amjhupi Meherpur). Higher TDS may indicate dissolved minerals or pollutants, but it is within safe limits for most uses.

Parameter	Range (Wet Season)	Key Observations
Temperature	25.9°C (Amjhupi Meherpur) – 28.2°C (Taranagar)	Typical for tropical wet seasons, indicating stable thermal conditions.
pH	5.9 (Terail) – 7.9 (Harbhanga)	Most values are near neutral (6.5–7.5), suitable for aquatic life. Terail's acidic pH may indicate organic matter or pollution.
Salinity	0.01–0.04 ppt	Low across all sites, reflecting freshwater dominance due to dilution from rainfall.
Turbidity	7.3 NTU (Harbhanga) – 67.3 NTU (GOR Pond)	High turbidity at GOR Pond suggests sediment or organic matter, potentially impacting aquatic ecosystems.
Dissolved Oxygen (DO)	4.9 mg/L (GOR Pond) – 7.3 mg/L (Terail)	Most sites have acceptable DO (>5 mg/L) for aquatic life, but GOR Pond's lower DO may stress organisms.
Total Dissolved Solids (TDS)	104 mg/L (Harbhanga) – 398 mg/L (Amjhupi Meherpur)	Higher TDS may indicate dissolved minerals or pollutants, but it is within safe limits for most uses.

1.1.2 Drinking Water Quality of Meherpur

According to DPHE, arsenic contamination has been identified in several locations within Meherpur District. The affected areas include Meherpur, specifically Shyampur and Alampur; Mujibnagar, including Bagdan, Joypur, Taranagar, and Baladpur; and Gangni, particularly

Sholotaka. Despite these challenges, there is no specific project for a rural piped water supply scheme to address this issue. It is estimated that around 300 families are served by the existing water supply systems. The district relies on deep tubewells, with Mujibnagar having approximately 800-900 tubewells and Gangni-Meherpur having around 700-800 tubewells. Additionally, the main tubewells are registered through the Upazila Office for monitoring and management.

1.2 Review of Existing Policies and Legislation

Policy Framework for Water and Sanitation in Bangladesh

- **National Water Policy, 1999:** Establishes the framework for sustainable management of water resources in Bangladesh, focusing on the equitable distribution of safe drinking water, wastewater treatment, and water conservation efforts. (Reference: Ministry of Water Resources, National Water Policy, 1999)
- **National Sanitation Strategy, 2005:** Aims to improve sanitation services in urban and rural areas, focusing on the construction of hygienic latrines, sewage systems, and awareness campaigns about proper sanitation practices. (Reference: Ministry of Local Government, National Sanitation Strategy, 2005)
- **The Bangladesh Water Act, 2013:** Provides a legal framework for water resources management in Bangladesh, including water quality standards and the prevention of water pollution. The Act covers groundwater, surface water, and drinking water regulations. (Reference: Ministry of Water Resources, The Bangladesh Water Act, 2013)
- **The Drinking Water Quality Standards (DWQS), 2005:** Sets the standards for drinking water quality, including permissible limits for contaminants like arsenic, bacteria, and heavy metals, ensuring the safety of water for human consumption. (Reference: Ministry of Local Government, Drinking Water Quality Standards, 2005)
- **The National Safe Drinking Water and Sanitation Policy, 1998,** focuses on the provision of safe drinking water and sanitation services, aiming to improve public health by addressing waterborne diseases and promoting hygienic practices. (Reference: Ministry of Local Government, National Safe Drinking Water and Sanitation Policy, 1998)
- **Water and Sanitation Sector Development Plan (WSSDP), 2011-2025:** A roadmap for improving water supply and sanitation services, with a focus on ensuring universal access

to safe water and sanitation facilities by 2025. (Reference: Ministry of Local Government, Water and Sanitation Sector Development Plan, 2011-2025)

- **Environmental Conservation Rules, 1997:** Regulates the protection and management of water resources in Bangladesh, including pollution control and ensuring that wastewater and other contaminants do not enter drinking water supplies. (Reference: Ministry of Environment and Forests, Environmental Conservation Rules, 1997)
- **National Health Policy, 2011:** Recognizes the role of safe water and sanitation in public health, highlighting the need for integrated water and sanitation services to prevent waterborne diseases and improve overall health outcomes. (Reference: Ministry of Health & Family Welfare, National Health Policy, 2011)
- **Bangladesh Arsenic Policy, 2004:** Specifically addresses arsenic contamination in groundwater, emphasizing the need for arsenic-free water sources and technologies to treat contaminated water. (Reference: Ministry of Water Resources, Bangladesh Arsenic Policy, 2004)