

# Crisis of Freshwater in South 24 Parganas District, West Bengal: Challenges, strategies, sustainable solution and Case study

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**Abstract:** South 24 Parganas, located in the Ganges Delta, faces water scarcity due to sea water intrusion, soil salinity, and contaminants. The district's tropical monsoon climate leads to acute water shortages outside the rainy season. The study analyzes water sources, aquifer disposition, and challenges in sustainable water management. Implementing solutions requires collaboration and navigating financial constraints, lack of public awareness, policy and regulatory hurdles, technological barriers, cultural resistance, environmental factors, infrastructure limitations, and equity issues.

## INTRODUCTION:

South 24 Parganas, theoretically abundant in water resources, faces challenges due to unique geo-hydrological conditions and a monsoon climate. The district relies on hand pumps and municipal pipelines for water, with variations in drinking water sources across blocks. Aquifer disposition is characterized by unconsolidated sediments, with fresh water-bearing aquifers at depths of 160 to 360 meters. However, saline water complicates access to fresh water.

## CHALLENGES AND STRATEGIES:

**Financial Constraints:** Implementing new technologies and infrastructure requires significant investment. Seeking funding from various sources and prioritizing projects based on urgency and impact can address this challenge.

**Lack of Public Awareness:** Launching comprehensive awareness campaigns and incorporating water education into school curriculums can promote water conservation practices.

**Policy and Regulatory Hurdles:** Working with policymakers to develop and enforce regulations that promote water conservation and sustainable use is crucial.

**Technological Barriers:** Providing training and capacity-building programs for local stakeholders can overcome the lack of technical expertise.

**Cultural and Behavioral Resistance:** Engaging with communities to understand their values and practices and developing culturally sensitive approaches is essential.

**Environmental and Climatic Factors:** Implementing adaptive water management strategies and promoting biodiversity and ecosystem restoration projects can address this challenge.

**Infrastructure Limitations:** Investing in the repair and modernization of existing water infrastructure and adopting smart water management systems is necessary.

**Equity and Access Issues:** Implementing policies and projects that prioritize the water needs of marginalized and vulnerable communities can address this challenge.

## SUSTAINABLE SOLUTIONS:

**Rainwater Harvesting:** Encouraging widespread adoption of rainwater harvesting systems can reduce dependence on groundwater and mitigate water scarcity.

**Community-led Water Management:** Empowering local communities to manage their water resources through participatory approaches, including forming water user associations, is crucial.

**Revival and Maintenance of Traditional Water Bodies:** Restoring and maintaining traditional water bodies like ponds, tanks, and wells can serve as reliable water sources if properly managed.

**Sustainable Agriculture Practices:** Promoting water-efficient agricultural practices can significantly reduce water usage in agriculture.

**Aquifer Recharge Projects:** Implementing managed aquifer recharge projects can enhance groundwater levels.

**Salinity Management:** Addressing soil and water salinity through the adoption of salt-tolerant crop varieties and desalination technologies is important.

**Water Recycling and Reuse:** Promoting the recycling and reuse of wastewater, especially in industrial and urban areas, can reduce the demand on fresh water sources.

#### CASE STUDIES:

**Rajasthan's Rainwater Harvesting Success:** The revival of ancient rainwater harvesting techniques has led to a significant increase in water levels across villages in Rajasthan, transforming arid landscapes into fertile agricultural lands.

**Singapore's NEWater Program:** The advanced water recycling and purification project meets a significant portion of Singapore's water demand, showcasing how technology and innovation can address water scarcity in urban environments.

**Kenya's Sand Dams:** The introduction of sand dams has dramatically improved water availability in rural communities, supporting agriculture, livestock, and human consumption.

#### CONCLUSION:

Addressing the water scarcity crisis in South 24 Parganas requires a multifaceted approach that combines traditional wisdom with modern technology. Collaboration among government, communities, businesses, and NGOs is crucial to overcome financial, social, and policy obstacles and move towards a more sustainable and water-secure future.