Giving water a second life

Water reuse and recycling is increasingly recognized as a triple bottom line opportunity and a sustainable solution to Bangladesh's water security and pollution challenges. With high population density and rapid industrialization, the demand for clean water continues to rise, even as traditional sources grow more strained. At the same time, untreated wastewater from industrial and municipal sources severely pollutes the water supply, further exacerbating the crisis. A strategic approach to mitigating the dual challenge of scarcity and pollution is water reuse and recycling: transforming wastewater into a valuable resource and putting it to (re)use again.

Despite being a land of rivers, Bangladesh faces significant water scarcity due to excessive groundwater extraction and surface water pollution, predominantly from the industrial and domestic sectors. Approximately 1,500 million cubic meters of groundwater are extracted annually for textile production in the Greater Dhaka Area alone, where the groundwater table is declining at an alarming rate of 2–4 meters per year. Still, this remains the primary water supply for 20 million residents and 6,000 industries in the region, which contribute nearly 40% of the country's GDP. Meanwhile, nine industrial clusters discharge 2.3 million cubic meters of toxic wastewater, compounded with an additional 2.55 million cubic meters of untreated municipal sewage, into nearby rivers and canals each day.

Over the last few decades, numerous initiatives—driven mainly by public sector command-and-control measures, incentives, and infrastructure regulations—have sought to address water security and pollution issues, particularly in Greater Dhaka. However, despite environmental regulations requiring wet processing industries to install effluent treatment plants (ETP), enforcement remains weak, and many facilities operate at minimal or nonexistent capacity.[1] Without corrective action, economic and financial losses are estimated at 2 billion USD annually and could reach a staggering 53 billion USD over the next two decades, surpassing the expected export targets of the ready-made garment (RMG) sector.

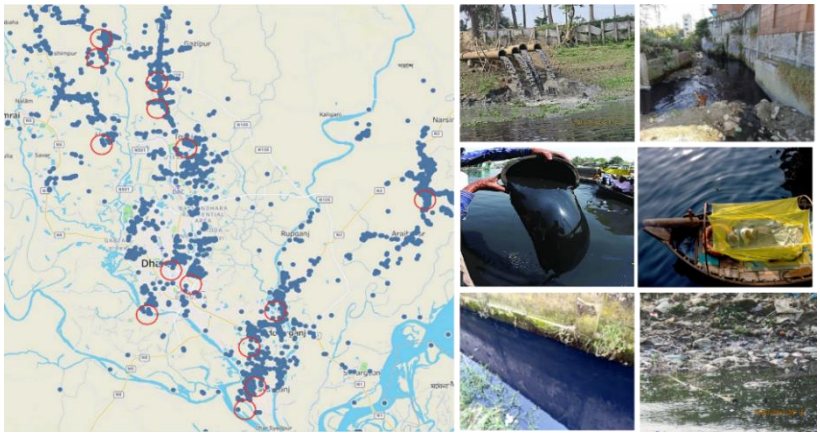

Figure 1: Location of wet processing industries

[1] The Greater Dhaka area is home to more than 15,000 industrial units, approximately 6,000 of which are wet processing industries. According to the Department of Environment, all wet processing industries classified as "red" or "orange" under ECR 1997 are required to have effluent treatment plants to treat their wastewater.

By 2050, 284 major cities worldwide, including 20 megacities, will face water scarcity. Industries, which are significant water consumers, discharge 80% of their wastewater with little to no treatment, contributing to 7% of global methane emissions. Currently, only 8% of total domestic and industrial freshwater withdrawals is reused globally (by installed capacity). In Bangladesh, however, the market for reuse and recycling remains largely untapped. If just 20% of the total wastewater discharged were accounted for, roughly 350 million cubic meters of wastewater could be reused and recycled annually. Studies reveal that only $1 investment in reuse has the potential of saving:

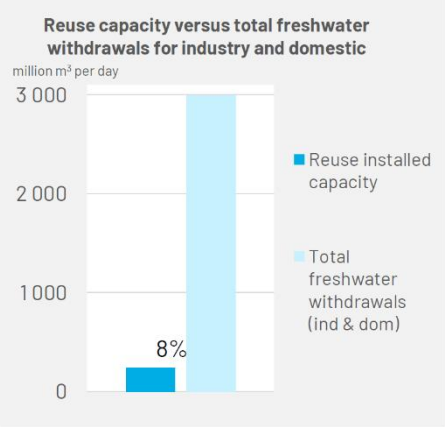

Figure 2: Global reuse capacity compared to freshwater withdrawals for industry and domestic use

- 26 m3 of groundwater abstraction per year
- 0.2 ton of GHG emissions per year.
- 2 MWh energy per year
- 23 m3 wastewater per year

To unlock this significant potential, the World Bank's 2030 Water Resources Group (WRG) is facilitating the formation of a Bangladesh Alliance for Reuse and Recycle (A4R). This alliance will bring together public sector entities, factories, brands, technology providers, investors, and academia, with the goal of advancing public-private collaboration to scale water reuse in Bangladesh.

A4R – Objectives

The objective of A4R is to unite the public and private sectors with a common vision for water security, mobilizing collective knowledge and resources to create and implement a joint action plan. The Alliance aims to establish a Water Reuse Target Framework and mobilize investments to achieve these targets for municipal and industrial sectors.

Multiple complementary objectives are proposed:

- Sustain existing municipal and industrial water supplies.
- Promote awareness of water use/reuse efficiency.
- Maximize economic returns per unit of water abstracted.
- Quantify water use/reuse trends and future availability.
- Improve predictability of future water access and investment needs.
- Reduce water pollution risks from industrial and municipal sources.
- Facilitate discussions on cross-sectoral water needs to incentivize water-resilient production practices.

A4R – Value Proposition

A4R will serve as a collaborative platform dedicated to advancing water resilience across industrial and municipal sectors. By enabling both inter-sectoral (municipal-industrial-agricultural) and intra-sectoral (industry-industry, domestic-domestic) water reuse, the Alliance aims to establish a sustainable market for reclaimed water. This market will generate new revenue streams and help offset the capital and operational costs associated with wastewater infrastructure. To realize this vision, A4R will develop robust business cases and build stakeholder buy-in, fostering an enabling environment that attracts private sector investment and drives long-term water resilience.

The heavily polluted canals and rivers around Greater Dhaka pose a significant environmental and public health threat. The recent ecological restoration initiative for the area's water system will require substantial investment—approximately $20 billion USD—along with extensive collaboration and strong commitment from industrial and municipal stakeholders. Achieving full-scale restoration demands integrated solutions addressing both upstream and downstream challenges. In this context, A4R will play a pivotal role in upstream solutions by scaling the treatment and reuse of wastewater that would otherwise be discharged untreated into waterways, thereby improving health and environmental outcomes. Moreover, the Alliance will complement national water security policies, including:

- National Water Policy and Industrial Water Management Policy
- Bangladesh Water Act 2013 and its 2018 Rules
- Bangladesh Delta Plan 2100 (BDP-2100)

Hosted by the Water Resources Planning Organization (WARPO) and leveraging 2030 WRG's unique expertise in advancing public-private collaboration, A4R will work with stakeholders and existing complementary initiatives to establish common targets and compliance frameworks for efficient and sustainable water use and reuse. Through this effort, A4R will create a Water Reuse Target Framework that brings together government, local industry, and global brands under a common agenda to achieve large-scale impact.

A4R – Key Outputs

- Set up a Technical Facilitation Unit, hosted by WARPO to facilitate the activities of A4R, technical support, policy advocacy, and stakeholder engagement
- Establish a Water Reuse Target Framework, including
    a. Targets for industry and city corporations under water reuse scheme by 2028
    b. Common standards framework for water reuse
- Develop a 5-year investment plan
- Identify modalities for establishing a Common Implementation Fund