Executive Summary

Community-monitoring of Industrial Chemical Pollution in Textile Communities in Bangladesh

Overview

This report provides an integrated assessment of chemical pollution, environmental degradation, and related health impacts in textile-producing communities across Ashulia, Bangladesh. Conducted by the Environment and Social Development Organization (ESDO) in cooperation with HEJSupport as part of the joint "Multi-actor Partnership for Improved Due Diligence Implementation in the Textile Sector", the study combines community-based monitoring (CBM), laboratory testing of soil, water, wastewater, and hair samples, as well as qualitative data from interviews and focus group discussions. The findings uncover widespread exposure to hazardous chemicals, ongoing regulatory gaps, and significant health challenges among residents - particularly women, workers, and children.

Key Environmental and Health Findings

Severe Environmental Contamination

Sampling across industrial zones such as Dhamsona, Ghoshbag, Noyapara, and Molla Bazar shows contamination of river and canal water, shallow groundwater, and agricultural soils.

- **PFAS contamination** reached 500–700 times above U.S. EPA drinking water limits (e.g., PFOS 2.78 µg/L vs. limit 0.004 µg/L), indicating acute and chronic health risks.
- **Short-Chain Chlorinated Paraffins (SCCPs)** were detected at 65.83 µg/L—almost triple the ZDHC wastewater limit (25 µg/L).

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- **Nonylphenol (NP), Octylphenol (OP), and NPEO** exceeded regulatory thresholds by more than 6–250 times, confirming widespread endocrine-disrupting pollution.
- **Lead in soil** (114.64 ppm) exceeded Bangladesh's agricultural safety standard (100 ppm), while cadmium (2.1 ppm) fell below but still requires monitoring due to toxicity and bioaccumulation concerns.
- **Additional contaminants** detected or suspected include phthalates, carcinogenic dyes, chromium, arsenic, and antimony.

Human Biomonitoring

Hair testing performed by the Minamata Convention laboratory in Japan revealed mercury levels above the safety threshold (1.0 ppm is the hair mercury level equivalent to the U.S. Environmental Protection Agency's (EPA) health advisory level) in 14 individuals out of 30 - with the highest concentrations in females (up to 2.79 ppm). Exposure is connected to diet but highlights the cumulative chemical burdens faced by these communities.

Community Health Impacts

Across all sampled sites, residents consistently reported:

- **Respiratory problems:** asthma, chronic coughing, breathing difficulties
- **Dermatological conditions:** rashes, eczema, contact dermatitis
- **Gastrointestinal illnesses:** diarrhea, gastric pain, nausea
- **Neurological symptoms:** headaches, fatigue, eye irritation

These symptoms closely match the toxicological profiles of the hazardous substances identified in laboratories. Communities near textile dyeing and washing units—especially Dokkhin Gazirchat, Nayanjholi Khal-Ghoshbag, Noyapara, and Molla Bazar—experience the highest exposure levels.

Vulnerable Groups

Women (especially homemakers), children, informal workers, and persons living adjacent to drainage canals experience disproportionate exposure through drinking water, food grown in contaminated soil, and direct contact with polluted wastewater.

Drivers of Pollution

The study highlights systemic issues that worsen chemical exposure as described below:

- Industrial effluents are discharged into open canals and agricultural land
- Malfunctioning or bypassed effluent treatment plants (ETPs)
- Unregulated waste dumping, including dye residues and chemical containers
- Blocked drainage systems are causing wastewater stagnation
- High thermal stress from factory boilers amplifies chemical volatilisation
- Limited municipal waste management services

These conditions together establish a dangerous living environment that breaches fundamental public health standards and human rights.

Regulatory Gaps

Bangladesh has ratified the Stockholm, Basel, Rotterdam, and Minamata Conventions, and has adopted the Environment Conservation Rules (2023) and Air Pollution Control Rules (2022). However:

- Enforcement is weak and inconsistent
- Factory compliance data is not publicly disclosed
- There is no national Pollutant Release and Transfer Register (PRTR)
- Inspections often fail to detect routine ETP bypassing
- Community-generated data is not integrated into national reporting systems
- This implementation gap contributes directly to ongoing contamination.

Policy Relevance

The findings align with global evidence showing that textile manufacturing—particularly dyeing, washing, and finishing—is a major source of persistent environmental pollutants and endocrine-disrupting chemicals. The Ashulia results are especially relevant for:

- EU supply chain due diligence rules
- ZDHC wastewater requirements
- Global chemicals conventions (POPs, mercury, PIC)
- National planning for health, environment, and industrial development

Key Recommendations

- Enhance enforcement of national environmental laws and expand the DoE's inspection capacity.
- Integrate CBM data into national monitoring and reporting mechanisms under global conventions.
- Promote the replacement of hazardous textile chemicals through a National Roadmap for Safer Chemistry aligned with ZDHC and EU REACH.
- Establish a national PRTR to ensure transparency of industrial emissions.
- Implement long-term health monitoring, especially in high-risk industrial areas.
- Create a cross-sectoral Textile Environmental Stewardship Platform involving government, industry, NGOs, workers, and communities.
- Adopt Extended Producer Responsibility (EPR) for textile waste and chemical impacts.
- Integrate pollution controls into urban planning to prevent factories from being located in residential or agricultural zones.

Conclusion

This study presents compelling scientific evidence that textile production in Ashulia is causing significant environmental contamination and measurable impacts on human health. The combination of hazardous wastewater, inadequate waste management, and weak regulatory oversight creates ongoing exposure pathways for local communities. Addressing these issues requires not only stronger enforcement and safer chemical substitutions, but also meaningful community participation and international cooperation. Implementing the recommendations would support Bangladesh's transition toward a transparent, equitable, and toxic-free textile sector - enhancing both public health and global supply chain integrity.

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