PHTHALATES AND BISPHENOLS IN BANGLADESH

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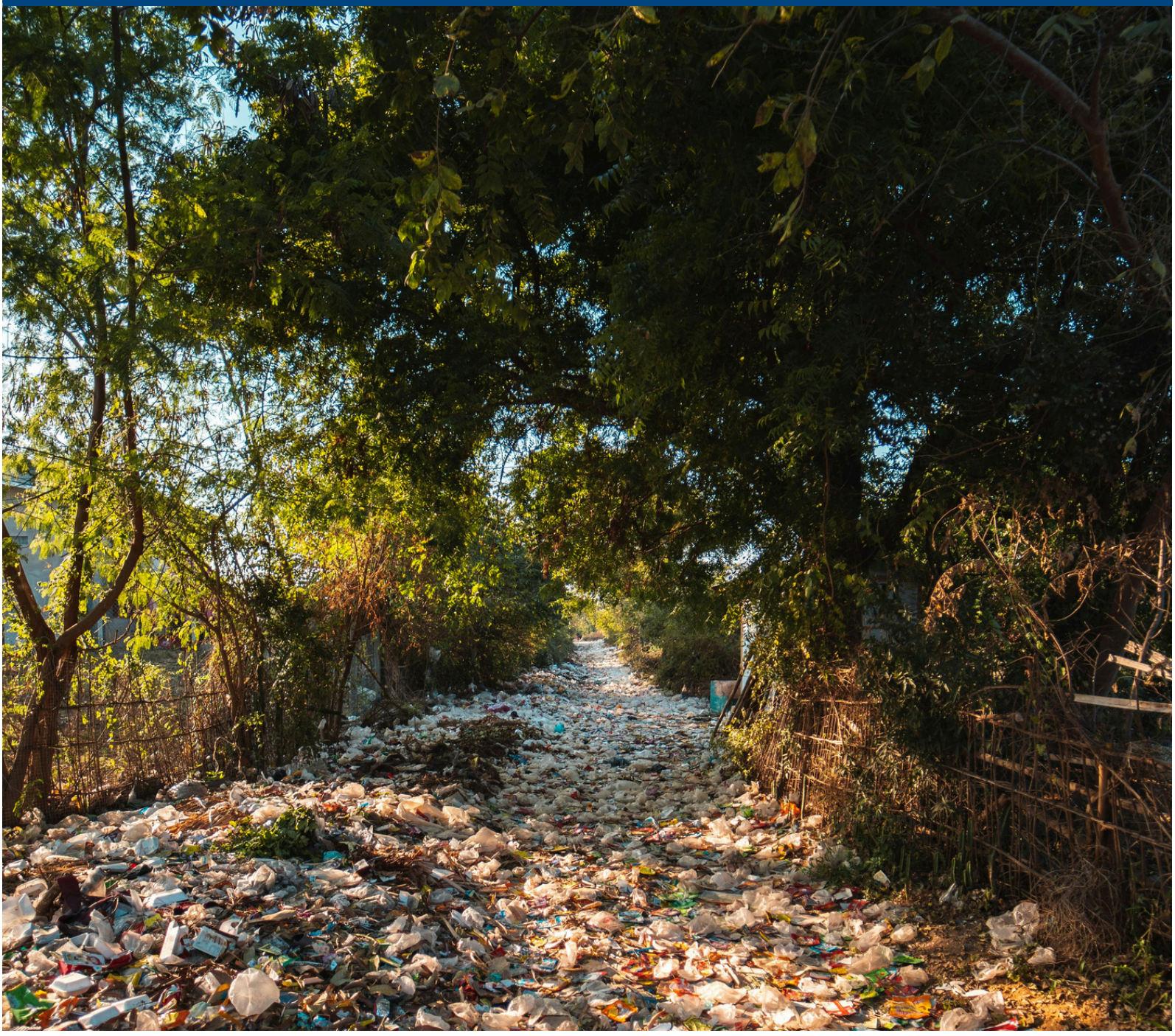

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Phthalates and Bisphenols: Country Situation Report in Bangladesh

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Environment and Social Development Organization – ESDO is a non-profit and non-government action research organization in Bangladesh. It works to disseminate messages about the need for environmental conservation, committed to protecting biological diversity and ensuring ecological balance. Since the official formation of ESDO in 1990, we have focused on generating knowledge amongst the broader community about how anthropogenic activities negatively impact the environment. ESDO strives to improve the livelihoods, socio-economic status, and environmental education of some of the most vulnerable communities in Bangladesh. ESDO invests in people who care for the environment by providing essential inputs and capacity building. As a pioneer organization in banning plastic bags in Bangladesh, we want to ensure self-reliant urban and rural communities that live in harmony with their healthy environment.

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IPEN is a network of over 600 non-governmental organizations working in more than 125 countries to reduce and eliminate the harm to human health and the environment from toxic chemicals. www.ipen.org

Summary
With an annual output of more than **3 million metric tons** and a domestic market valued at over **USD 3 billion**, Bangladesh's plastic manufacturing and consumption are expanding rapidly. However, the nation is still largely dependent on imports of basic polymers and additives, such as bisphenols and phthalates, which are frequently used as stabilizers and plasticizers in plastics. Although there is very little local production of these dangerous substances, imports are substantial. In 2020, Bangladesh imported a total of **10,800 tons** of phthalic anhydride, as well as several shipments of bisphenol A (BPA) and dibutyl phthalate (DBP) from countries including India, China, and Germany.

Regulatory controls are emerging but remain fragmented. The most notable progress is the draft Food Safety (Food Contact Materials) Regulation, 2024, which sets migration limits for BPA (0.05 mg/kg) and DEHP (1.5 mg/kg) in food contact materials, closely aligning with EU standards. **Draft *Food Safety (Food Contact Materials) Regulation, 2024*** by the Bangladesh Food Safety Authority was *planned to be adopted by the end of 2025 and then come into force mid-2026* (roughly six months after publication in the official gazette) (Food Packaging Forum). Bangladesh has also maintained a long-standing ban on polythene bags, highlighting the government's willingness to regulate hazardous plastics, though broader bans on phthalates and bisphenols are still lacking. Transparency and traceability regulations in Bangladesh are limited. While the Bangladesh Standards and Testing Institution (BSTI) enforces quality certification, there is no requirement for chemical disclosure, which leaves consumer rights unaddressed.

Research has shown widespread contamination of phthalates in children's stationery, rivers, and fish, as well as the presence of BPA and BPS in thermal paper receipts. These substances are linked to serious health issues, including cancer, hormonal disruptions, and reproductive risks, with children and pregnant women identified as the most vulnerable groups.

In summary, Bangladesh is at a pivotal point in its history. It has started to regulate phthalates and bisphenols, but in order to protect the environment and public health, it needs to move toward comprehensive bans, consumer-right-to-know measures, and stricter enforcement.

1. Introduction

Bangladesh, a rapidly industrializing South Asian nation, is experiencing exponential growth in the production and consumption of plastics. The country now produces over **3 million metric tons of plastic annually**, and the domestic market is valued at around **USD 3 billion**, growing at nearly **20% per year** (BIDA, 2024; Meet Bangladesh, 2024). The plastics sector employs approximately **1.5 million workers** across **6,000 enterprises**, meeting more than 80% of domestic demand (Meet Bangladesh, 2024).

However, the country's plastics industry remains heavily dependent on imported raw polymers and additives because Bangladesh lacks a local polyolefin or resin production facility. Imports of

polyethylene, polypropylene, PVC, and related raw materials total about **750,000 tonnes annually**, mainly from **China, India, Saudi Arabia, South Korea**, and **Thailand** (The Daily Star, 2023; Business Inspection, 2024).

Globally, chemicals such as **phthalates** and **bisphenols** are under increasing scrutiny due to their **endocrine-disrupting**, **carcinogenic**, and **developmental toxicity** effects. Phthalates (e.g., DEHP, DBP, DINP) interfere with hormone function, while bisphenols (e.g., BPA, BPS) have been linked to breast cancer, reproductive disorders, and metabolic disease (WHO, 2023). These compounds migrate easily from plastics into food, air, and dust, making human exposure widespread.

In Bangladesh, studies by **ESDO** and academic institutions have revealed significant contamination: phthalates in children's stationery, BPA and BPS in thermal receipts, and phthalate esters in rivers near industrial hubs like Savar and Tongi (ESDO, 2022; MDPI, 2023). These findings point to the pervasive, unregulated use of hazardous additives across consumer goods and the environment.

Governmental response has begun to evolve. The **draft Food Safety (Food Contact Materials) Regulation 2024** establishes migration limits for **BPA (0.05 mg/kg)** and **DEHP (0.04 mg/kg)**, aligning with EU standards (Food Packaging Forum, 2025). Bangladesh's **ban on polythene bags** under the *Environment Conservation Act 1995 (Amend. 2002)* also demonstrates regulatory commitment. However, broader restrictions on phthalates and bisphenols remain absent, leaving significant policy gaps. This report therefore aims to assess national production, import, regulatory controls, and health impacts of these chemicals and identify pathways for safer management.

Beyond these measures, two other policy domains indicate increasing national awareness of chemical risks:

Hazardous Waste Management Rules: Although not yet explicitly listing phthalates or bisphenols, these rules classify toxic and persistent plastic waste as hazardous, creating a legal basis to regulate the disposal, recycling, and environmental release of additive-laden plastics.

BSTI Toy Standards (BDS ISO 8124:2025 series): Bangladesh has developed testing standards for **phthalate esters in toys** (Part 6:2025), alongside limits for heavy metals such as lead (Part 3:2025). However, these standards remain **non-mandatory**, underscoring the need for enforceable chemical safety requirements. Currently, the standards are going to be mandatory, and the processes are underway.

Collectively, these developments show growing institutional recognition of the health and environmental risks posed by hazardous additives in plastics. However, **comprehensive controls on phthalates and bisphenols remain absent**, leaving major regulatory gaps across consumer goods, imports, and waste management. This report, therefore, aims to assess national production, import patterns, regulatory frameworks, exposure pathways, and health impacts of these chemicals, and outline evidence-based recommendations for safer management in Bangladesh.

2. Methods

This country report was prepared using a **mixed-method approach** combining desk research, data triangulation, and stakeholder consultations.

1. **Desk Review of National Sources**

National data were collected from the **Bangladesh Bureau of Statistics (BBS)**, **Bangladesh Investment Development Authority (BIDA)**, **Export Promotion Bureau (EPB)**, and **Bangladesh Standards and Testing Institution (BSTI)**. Regulatory documents such as the **Bangladesh Environment Conservation Act 1995 (Amend. 2002)** and the **draft Food Safety (FCM) Regulation 2024** were examined to identify chemical-control measures (BFSA, 2025).

2. **Review of International Databases and Trade Statistics**

Data on chemical imports and exports were compiled from the **World Integrated Trade Solution (WITS)**, **UN Comtrade**, **Volza**, and **Zauba** platforms. These sources provided shipment-level data for **phthalic anhydride**, **Dibutyl Phthalate (DBP)**, and **Bisphenol A (BPA)** (WITS, 2020; Volza, 2025). Relevant scientific publications and NGO reports—including **ESDO's** baseline studies on erasers and thermal paper—were also reviewed.

3. **Stakeholder Consultation**

Semi-structured **key informant interviews (KIIs)** were planned with representatives of the **Bangladesh Food Safety Authority (BFSA)** and **BSTI to** verify findings and capture implementation challenges.

4. **Data Triangulation and Validation**

Cross-checking between sources was applied to ensure reliability; for example, discrepancies in import volumes from WITS and Volza were averaged to produce consistent estimates. This integrated approach provides a balanced picture of the country's situation regarding phthalates and bisphenols.

3. Production and Use of Phthalates and Bisphenols in Bangladesh

3.1 Plastic Production, Imports, and Exports

The plastics sector has become one of Bangladesh's most dynamic industries. Annual production exceeds **3 million metric tons**, with packaging accounting for 40%, household items 22%, and construction materials 16% (BIDA, 2024). Around **750,000 tonnes of raw polymers** are imported each year due to the absence of local resin production facilities (The Daily Star, 2023). Major suppliers include **China, India, Saudi Arabia, and South Korea** (WITS, 2020).

Plastic exports reached **USD 209.86 million in FY 2022–23**, increasing to **USD 203.63 million** between July 2024 and February 2025—a **21% growth** year-on-year (EPB, 2025). The government

targets **USD 17 billion in exports by 2030** to capture **3% of the global market** (TBS News, 2023). However, rapid expansion without chemical regulation poses environmental and occupational health risks.

3.2 Import and Use of Phthalates and Bisphenols

Bangladesh does **not manufacture** phthalates or bisphenols domestically; all industrial use depends on **imports**.

- **Bisphenol A (BPA)** — Approximately **15 shipments** arrived in 2025 from **India** and **Germany**; exports totaled **13.5 tonnes** (USD 23,541), mostly to **Nepal** (Volza, 2025).
- **Dibutyl Phthalate (DBP)** — **332 shipments** imported from **India, China, Spain**, and **29 re-exports** recorded (Volza, 2025).
- **Phthalic Anhydride** — Imports reached about **10.8 million kg (≈10,800 tonnes)** in 2020, mainly from **South Korea, India, and China** (WITS, 2020).

These chemicals are widely used in **flexible PVC**, **packaging**, **toys**, **stationery**, **adhesives**, and **thermal papers**, with little or no chemical disclosure requirements. This reliance on imported additives highlights Bangladesh's position as a **consumer and minor re-exporter** of hazardous plasticizers, with minimal domestic monitoring.

4. Regulatory controls on phthalates and/or bisphenols in the country

4.1. Does the country have any controls on phthalates and/or bisphenols?

Bangladesh has begun to establish limited controls on **phthalates** and **bisphenols**, but these measures are still partial, product-specific, and at an early stage of development. The country's current legal instruments mainly address general plastic pollution rather than individual chemical additives. Nevertheless, the emerging regulatory landscape signals a growing recognition of the risks posed by endocrine-disrupting chemicals in plastics.

1. Draft Food Safety (Food Contact Materials) Regulation, 2024

The most concrete progress to date is seen in the **Draft Food Safety (Food Contact Materials) Regulation, 2024**, introduced by the **Bangladesh Food Safety Authority (BFSA)** under the Ministry of Food. This draft law establishes **specific migration limits (SMLs)** for hazardous substances that can leach from packaging into food, bringing Bangladesh closer to **EU-equivalent standards** for consumer protection.

Key provisions include:

- **Bisphenol A (BPA):** Maximum migration limit of **0.05 mg/kg**.

- **Di(2-ethylhexyl) phthalate (DEHP):** Maximum migration limit of **0.04 mg/kg**.
- Additional requirements for **traceability, inspection, and quality assurance** in food-contact material manufacturing and import.

The regulation aims to replace the older *Food Contact Materials Regulation, 2019*, and is expected to **come into force by mid-2026**. Once implemented, it will mark Bangladesh's **first legally binding control** over specific bisphenols and phthalates. Food Safety Regulation-2024

However, these limits currently apply **only to food-contact applications**, leaving large exposure gaps for other consumer products—such as toys, stationery, thermal receipts, and cosmetics—where phthalates and bisphenols are also widely used.

2. Hazardous Waste Management Rules of Bangladesh

While Bangladesh does not yet impose **direct chemical-specific restrictions** on phthalates or bisphenols under hazardous waste law, the **Hazardous Waste (Management & Handling) Rules**, enforced under the Environment Conservation Act, provide an important **regulatory entry point**.

Relevance to phthalates and bisphenols:

- The Rules classify **waste plastics, waste solvents, and waste chemical formulations** as hazardous if they contain toxic, persistent, or bioaccumulative substances.

- Since **phthalates (e.g., DEHP, DBP, DINP)** and **bisphenols (e.g., BPA, BPS)** are recognized globally as **toxic, endocrine-disrupting, and environmentally persistent**, any plastic waste containing these additives can fall under the "hazardous waste" category **depending on concentration and leaching potential**.

- The Rules mandate:

    - **Safe collection, segregation, and disposal** of hazardous plastic waste
    - **Registration of facilities** handling such waste
    - **Restrictions on the import/export** of hazardous plastic waste
    - **Environmental monitoring and record-keeping**

Policy significance:
Even though Bangladesh does not explicitly list phthalates or bisphenols as hazardous substances, the Rules create a **legal basis to control their release into the environment**, especially from informal recycling, industrial waste, and open burning of flexible plastics containing phthalate plasticizers.

3. Ban on Polythene Bags under the Environment Conservation Act (1995; Amendment 2002)

Bangladesh was among the first countries in South Asia to introduce a national **ban on polythene (plastic) bags**, under the *Bangladesh Environment Conservation Act, 1995* (amended 2002). The ban prohibits the **production, import, marketing, and use** of polythene bags below a certain thickness.

While primarily an anti-pollution measure, it also has **indirect implications for phthalate control**, since polythene and similar soft plastics often rely on **phthalate plasticizers**—such as DEHP, DBP, and DINP—to increase flexibility and durability.

Although enforcement has been uneven, the ban remains symbolically and legally important. It sets a **regulatory precedent**: if a harmful plastic product can be banned based on environmental grounds, the **toxic additives within those plastics** should logically also be restricted on public health grounds. This linkage provides a strategic entry point for future **chemical-specific controls**. Polythene Bag Ban 2024

4. BSTI Standards for Toys – Phthalate Limits (Non-mandatory as of yet)

Bangladesh Standards and Testing Institution (BSTI) has developed chemical and safety standards for toys, aligned with the **ISO 8124** series. These standards cover heavy metals, phthalates, fire safety, and microbiological safety.

Relevant Standards:

- **BDS ISO 8124 Part 3:2020** – Migration of certain elements such as **Lead**
- **BDS ISO 8124 Part 6:2020** – **Certain phthalate esters**
- **BDS ISO 8124 Parts 2 & 12** – Fire safety and microbiological safety
- **Updated Draft (2025)** – BDS ISO 8124 series under revision (Part 6:2025) to strengthen enforcement

What this means for phthalates:

The existence of the **BDS ISO 8124 Part 6** demonstrates that Bangladesh formally recognizes the risks posed by phthalates in children's toys. The standard includes testing requirements for **DEHP, DBP, BBP, DINP, DIDP, and DNOP**—chemicals widely used as plasticizers in soft PVC toys.

Non-mandatory status (2020–2024):

From **2020 until now**, these standards have been:

- **Voluntary**,
- **Not required for import clearance or local manufacturing**, and
- **Not included in the list of 274 mandatory BSTI-certified products**.

As a result, compliance depends largely on voluntary industry action, donor-funded testing, or NGO-driven initiatives—meaning most toys on the Bangladeshi market have **not been tested** for phthalate content. But the positive note is the officials are working towards making these standards mandatory.

Regulatory Update – Progress Toward Mandatory Enforcement (2025):

As of **2025**, BSTI has initiated a process to **update and upgrade** the ISO 8124 series—including **Part 6 (Phthalates)**—with the intention of making these limits **mandatory** for:

- Local manufacturers,
- Importers,
- Distributors, and
- Retailers.

The current update process aims to:

- Include toys under the list of regulated products requiring mandatory BSTI certification,
- Enforce routine testing for phthalates and heavy metals before marketing approval, and
- Align Bangladesh's toy safety regulation with international standards adopted in the EU and ASEAN.

Regulatory Implication:

Bangladesh has long had the **technical standards**, but historically lacked **legal enforceability**. The **2025 update process** marks a significant regulatory shift—moving toward **mandatory phthalate limits** in toys, which could substantially reduce children's exposure to hazardous plasticizers.

5. Indirect Controls through Product Standards and Import Rules

The **Bangladesh Standards and Testing Institution (BSTI)** mandates product quality certification for 274 listed goods, including selected plastic items, under the **BSTI Mark Certification Scheme**. While the scheme ensures compliance with mechanical and physical quality standards, it does **not yet require disclosure or testing of phthalate or bisphenol content**.

Import regulations under the **Customs Act** and the **Import Policy Order (2021–2024)** likewise require safety declarations for hazardous chemicals, but these requirements focus on substances covered under international conventions (e.g., pesticides, heavy metals) and not plasticizers or phenolic additives. Consequently, most imported plastic goods enter Bangladesh **without additive testing or labeling**.

6. Draft National Policy and Action Plan on Sustainable Plastic Management (2020–2030)

The **Department of Environment (DoE)** and **World Bank** jointly developed this policy framework to **phase out 90 percent of single-use plastics by 2026**. While the plan does not directly name phthalates or bisphenols, it emphasizes the need for **"hazardous additive reduction"** and **"safe plastic substitution."** These provisions create a policy opening for future integration of specific **phthalate and bisphenol restrictions**, particularly within packaging and consumer goods. National Action Plan on Sustainable Plastic Management

7. National Testing and Research Initiatives

Non-governmental research has also supported emerging regulatory interests. Studies by **ESDO (2022)**, **MDPI (2023)**, and **local universities (2024)** have documented the presence of **BPA, BPS, and phthalates (DBP, DEHP, DINP)** in **thermal receipts, school erasers, and river water**. These findings have been cited in policy dialogues to justify chemical-specific controls under the draft food-contact regulation and possible future **standards for children's products**.

4.2. Does the country have any regulations on transparency and traceability of chemicals in plastics (labels, databases, consumer rights)?

Bangladesh currently has only **limited regulatory measures** addressing transparency and traceability of chemicals in plastics (such as phthalates and bisphenols), and these measures are fragmented across different sectors rather than part of a unified framework.

1. Absence of mandatory chemical-additive disclosure for consumer plastics
For most general plastic consumer products, such as toys, stationery, packaging materials, and and food-contact plastics, notably, **no law requires manufacturers or importers to disclose specific chemical additives** (e.g., phthalates or bisphenols) on product labels, in databases, or through consumer-accessible information. Import regulations largely require only basic information such as the consignee name, invoice, country of origin and classification of goods, but do **not require chemical composition details for plastics**.
The product certification regime under the Bangladesh Standards and Testing Institution (BSTI) applies to many goods (having increased from 229 to 274 products under mandatory certification) but focuses on **product quality and safety standards** rather than full **chemical disclosure of additive content**. Bangladesh Product Compliance

Thus, consumers have the right to know "which chemical additives are in this plastic product?" remain **largely unmet**.

2. Some progress in the food-contact materials (FCM) arena
One of the few regulatory instruments in which traceability and chemical migration limits are explicitly referenced is the Draft Food Safety (Food Contact Materials) Regulation, 2024 (under the Bangladesh Food Safety Authority – BFSA). Key features of this draft regulation include:

- Definition of "specific migration limit (SML)" — the maximum permitted amount of a given substance released into food from packaging.
- For plastics, inclusion of substances in Schedule I such as **Bisphenol A (BPA)** at 0.05 mg/kg and **Di(2-ethylhexyl) phthalate (DEHP)** at 1.5 mg/kg as permissible migration limits. Draft Law on Food Contact Materials
- Obligations for **registration of business operators**, inspections, **labelling of food-contact materials**, and traceability of materials through supply chains. Food Contact Regulation.
  This draft regulation, once adopted (expected mid-2026), will represent the **most advanced regulatory measure in Bangladesh** for chemical traceability and transparency in plastics.

3. Product certification (BSTI) and voluntary traceability schemes
The BSTI certifies numerous products and enforces a mark scheme: manufacturers must affix the BSTI mark on covered products (274 product categories under the latest circular) and comply with testing/inspection. Product Compliance regulations

However:

- The BSTI scheme does **not require each plastic or packaging product to list the specific chemical additives (such as phthalates or bisphenols)** used.
- Traceability of chemical additives is not mandated by law or regulation; rather, what exists is **certification mark compliance**, which focuses on performance and standardization (e.g., product safety, dimensions, electrical safety) more than chemical safety of plastic additives.

On the recycling side, there are **voluntary certification schemes** such as the EN 15343 standard (chain-of-custody for recycled plastics) offered by private certification bodies like SGS in Bangladesh. While these improve traceability of recycled plastic content and processing, they are **not legally required** and do not cover full disclosure of chemical additives in plastics. (No national database compulsory for additives).

5. Known impacts of phthalates/bisphenols in the country

5.1. Have there been any studies on phthalates and/or bisphenols in the country? Briefly describe and, when possible, please specify which phthalates and/or bisphenols that the data covers.

While Bangladesh does not manufacture phthalates or bisphenols, several scientific and NGO-led studies reveal their significant presence in the country's environment, consumer products, and even human biological samples. The studies demonstrate exposure through **industrial pollution, consumer goods, and daily-use materials**, raising urgent public health concerns.

- **Phthalates in Urban Rivers (2023)**
  A study published in the *Journal of Hazardous Materials Advances* examined seven phthalate esters — **DMP, DEP, DBP, BBP, DEHP, DEHA, and DNOP** — in the industrial rivers of **Savar and Tongi** near Dhaka. The total concentration of phthalates (∑7 PAEs) ranged from **8.27–54.1 µg/L in Savar** and **24.6–156 µg/L in Tongi**. **DEHP** was the most abundant compound and presented **high ecological and carcinogenic risks** to both aquatic organisms and humans via oral and dermal routes (A pioneering study on endocrine disruptors (phthalates esters) in urban rivers of Bangladesh: An appraisal of possible risk assessment to ecology and human health)
- **Phthalates in Children's Erasers (ESDO, 2022)**
  The Environment and Social Development Organization (ESDO) tested **47 erasers** available in Bangladeshi markets and found that **30 contained phthalates**, specifically **DiBP, DBP, DEHP, and DINP**. The report highlighted serious risks to children, as erasers are frequently handled and even chewed, leading to possible **hormonal disruption, developmental toxicity, and respiratory issues**. Phthalates in Erasers ESDO Study
  (Source: ESDO Report, Phthalates in Erasers, 2022.)
- **Bisphenols in Thermal Paper Receipts (ESDO & Wonjin Institute, 2022)**
  ESDO and the Wonjin Institute analyzed **39 thermal paper receipts** from supermarkets, pharmacies, and ATMs in Dhaka. The results revealed **BPA in 67.5% (0.83–1.71% by weight)** and **BPS in 25% (0.61–0.96%)**, exceeding the **EU limit of 0.02%**. Alternatives like BPF, BPB, and BPAF were undetected. A baseline survey also found **0% public awareness** regarding

BPA exposure among retail workers and consumers. Detection of Endocrine Disruptor Bisphenol A and Bisphenol S in Bangladeshi Thermal Paper Receipts

- **Bisphenol A Exposure and Breast Cancer Among Bangladeshi Women (2024)** A biomedical study compared BPA exposure levels between breast cancer patients and healthy women in Bangladesh. Results showed **serum BPA concentrations 4–7 times higher (17–34 ng/mL)** among breast cancer patients compared to controls (~4 ng/mL). Elevated BPA levels were associated with **breast tenderness, fatigue, and hormonal imbalance**, underscoring gender-differentiated health impacts of bisphenol exposure. BPA (Bisphenol A) Exposure As An Environmental Risk Factor -A Cross Sectional Study on Breast Cancer Among the Bangladeshi Female Population.
- **Phthalate Toxicity in Livestock (2024)** Animal studies on **pregnant Black Bengal goats** exposed to phthalates (DEP, DBP, DiBP, DPP) found reduced **estrogen, progesterone, and thyroid hormones**, and reproductive disorders such as **abortions and retained placenta**. These findings reflect broader reproductive toxicity risks applicable to human health. Phthalate plasticizer affects blood electrolytes, hormones, and reproductive parameters of black Bengal goats
- **Microplastics and Chemical Contamination in Fish (2023)** A national survey found that **83% of fish samples** from Bangladeshi markets contained **microplastics contaminated with phthalates and BPA**, suggesting a **dietary exposure pathway** for the general population through seafood consumption. Microplastics have been discovered in 83% of Bangladeshi fish
- **Toxic Effects of Plastic on Human Health (Global Reference, 2018)** A global review of plastic additives and their human health effects reported that **phthalates and bisphenols** contribute to reproductive issues, metabolic disorders, and cancer. The study emphasized that developing countries like Bangladesh face **greater exposure risks** due to high plastic use and weak regulation. Toxic effects of plastic on human health and environment : A consequences of health risk assessment in Bangladesh
- **Plastics and Endocrine Disruption (Rochman et al., 2016)** An influential study published in *Environmental Science & Technology* reviewed global data showing widespread release of **phthalates and bisphenols** from consumer plastics and their links to **endocrine disruption, fertility decline, and developmental toxicity**. This global evidence supports the national findings in Bangladesh. Phthalate and Nonphthalate Plasticizer Exposure among Children of Korea, Thailand, Indonesia, and Bangladesh: Occurrences and Risk Comparison

The combined findings from these studies confirm that:

- **Phthalates** such as DEHP, DBP, and DINP are present in Bangladesh's rivers, consumer goods, and food chain, posing long-term ecological and health risks.
- **Bisphenols**, especially BPA and BPS, are widespread in consumer receipts and linked to measurable health impacts among women.
- Vulnerable populations — **children, women, and retail workers** — face the highest exposure risks through school supplies, packaging, and daily handling of plastic materials.
- These findings underscore the urgent need for **national regulation, biomonitoring, and public awareness programs** to control exposure to these harmful endocrine-disrupting chemicals.

5.2. Are there specific groups of people or places in the country where exposure to phthalates and bisphenols is especially high?

Although data on chemical exposure in Bangladesh remains limited, available studies indicate that **phthalates and bisphenols are widespread** in both urban and rural settings. Certain groups—especially **children, women, and industrial communities**—face greater risks due to frequent contact with contaminated materials, occupational exposure, or dietary intake.

- **Industrial areas and surrounding communities (Savar and Tongi)**
  Research has identified the **Savar and Tongi industrial zones** as major hotspots for **phthalate contamination**. Rivers in these areas contained up to **156 µg/L of total phthalates**, with **DEHP and DBP** posing particularly high ecological and carcinogenic risks. Communities living near these factories, including **workers, women, and children**, are exposed through **polluted water, air, and locally sourced fish**. (Afidia The Journal, A pioneering study on endocrine disruptors (phthalates esters) in urban rivers of Bangladesh, Research Gate, microplastics-have-been-discovered-in-83-of-bangladeshi-fish)

- **Children exposed through school materials and toys**
  An ESDO investigation in 2022 found that **30 out of 47 erasers** commonly used by schoolchildren in Bangladesh contained **phthalates such as DEHP, DBP, and DINP**. Because children often chew or handle these items, they face increased risk of **oral and dermal exposure**, which can disrupt hormonal balance, growth, and reproductive development.Phthalates-in-Erasers

- **Women's exposure and health impacts**
  A 2024 biomedical study found that **Bangladeshi women with breast cancer** had **serum BPA levels 4–7 times higher (17–34 ng/mL)** than healthy controls (~4 ng/mL), linking BPA exposure to **breast tenderness, hormonal imbalance, and cancer risk**. Additionally, women working in retail environments are regularly exposed to **BPA and BPS** through **thermal receipts**, which contained **0.83–1.71% BPA** and **0.61–0.96% BPS**—both well above EU safety limits.BPA_Bisphenol_A_Exposure_As_An_Environmental_Risk_Factor_-A_Cross_Sectional_Study_on_Breast_Cancer_Among_the_Bangladeshi_Female_Population

- **Reproductive health and pregnancy outcomes**
  Experimental studies using **pregnant Black Bengal goats**—a relevant local model—showed that phthalate exposure (DEP, DBP, DiBP, DPP) caused **reduced estrogen and progesterone levels**, as well as **abortion and delayed pregnancy recovery**, suggesting potential risks for **human reproductive health** under similar exposure conditions.

Exposure to environmentally relevant phthalate mixture during pregnancy alters the physical and hemato-biochemical parameters in Black Bengal goats

In summary, **children, women, and industrial communities** in Bangladesh face the highest exposure to phthalates and bisphenols. Industrial pollution, consumer products, and dietary intake act as the primary exposure pathways. Gender-differentiated evidence—particularly the association between **BPA and breast cancer in women**—and findings on children's products underscore the

urgent need for **targeted monitoring, regulatory controls, and public education** to protect vulnerable groups from these endocrine-disrupting chemicals.

6. National endeavors to phase out bisphenols and/or phthalates

6.1. Have there been any projects/campaigns to phase out phthalates/and or bisphenols?

Bangladesh has yet to enact a direct chemical-specific regulation to phase out **bisphenols** (e.g., BPA, BPS, BPF) or **phthalates** (e.g., DEHP, DBP, BBP, DINP, DIDP, DIBP). However, the country has entered a crucial **transition phase** in plastic management, marked by a series of **policy reforms, court directives, NGO-led advocacy, and draft regulations** that collectively signal a growing commitment to control harmful additives in plastics.

These actions—though often framed under the broader agenda of **plastic pollution and public health protection**—create a foundation upon which **phthalate and bisphenol phase-outs** can be built.

1. ESDO's National Campaign to Phase Out Bisphenols in Thermal Paper Receipts

The **Environment and Social Development Organization (ESDO)** has led Bangladesh's first **targeted advocacy and research campaign** addressing **bisphenol exposure** in consumer products.
In its 2022 study, *"BPA in Receipts: Toxin in Finger"*, conducted with the **Wonjin Institute of Occupational and Environmental Health (Korea)**, ESDO analyzed **39 thermal paper receipts** collected from ATMs, pharmacies, and supermarkets in Dhaka. Results revealed **BPA in 67.5%** of samples (0.83–1.71% by weight) and **BPS in 25%** (0.61–0.96%), all far exceeding the **EU safety threshold of 0.02%**.

Following the study, ESDO launched a nationwide awareness campaign that included:

- Press conferences, radio segments, and media outreach under the slogan *"Toxin in Finger."*
- Policy dialogues with the **Department of Environment (DoE)** and **Bangladesh Food Safety Authority (BFSA)** to demand a **ban on phenol-coated receipts**.
- Recommendations for **interim control measures**, such as **mandatory switching to phenol-free thermal papers**, **use of protective gloves by cashiers**, and **public advisories for pregnant women and workers**.

This remains Bangladesh's **most concrete civil-society initiative aimed specifically at bisphenol phase-out**, setting an important precedent for chemical-focused advocacy beyond general plastic waste management.

2. Ban on Plastic Bags in Supermarkets (Effective October 1, 2024)

The **October 1, 2024 national ban** on **polythene and polypropylene bags** in supermarkets represents a significant regulatory milestone in Bangladesh's plastic governance framework. The **Ministry of Environment, Forest, and Climate Change (MoEFCC)** directed all retail chains and supermarkets to stop using single-use plastic bags and replace them with **jute, paper, or cloth alternatives**.

This decision followed sustained advocacy from **ESDO**, **BELA (Bangladesh Environmental Lawyers Association)**, and civil society groups, as well as **High Court orders** issued between 2020 and 2023. The ban is now being implemented in Dhaka and other major cities, with the government pledging to extend it nationwide.

While this initiative focuses on **single-use plastic pollution**, it has **direct implications for phthalate and bisphenol exposure**, because:

- Many plastic bags and food packaging materials are produced using **phthalate plasticizers** (DEHP, DBP, DINP) to improve flexibility and transparency.
- Certain packaging materials and laminates contain **bisphenol-based resins** (BPA, BPS) used in printing inks and coatings.

By eliminating these plastic categories from circulation, the ban **reduces the release of toxic additives into the environment** and **sets a precedent** for introducing **chemical-specific bans**, such as restricting **BPA in receipts** and **phthalates in toys and packaging**. Bangladesh Bans Polythene Bag

3. Draft Food Contact Materials (FCM) Regulation (2024–2025)

In 2024, the **Bangladesh Food Safety Authority (BFSA)** proposed a landmark **Food Contact Materials Regulation**, the first of its kind in the country. This draft legislation introduces **specific migration limits (SMLs)** for hazardous chemicals migrating from packaging into food. Notably, the regulation explicitly identifies **Bisphenol A (BPA)** and **Di(2-ethylhexyl) phthalate (DEHP)** among the restricted substances.

If enacted, this law will mark Bangladesh's **first direct legal recognition** of these chemicals as food safety risks, aligning the country with international standards such as the **EU Regulation (EU) No. 10/2011** and **WHO/FAO Codex guidelines**.

The draft regulation proposes:

- A ban on the **use of BPA-based plastics** in baby bottles and food containers.
- Limitations on **phthalate content** in materials used for food packaging, storage, and transportation.
- Testing and certification requirements for **imported and domestically produced packaging**.

4. National Action Plan for Sustainable Plastic Management (2020–2030)

The **Department of Environment (DoE)**, in collaboration with the **World Bank**, launched the **National Action Plan for Sustainable Plastic Management (2020–2030)**. The plan aims to:

- **Phase out 90% of single-use plastics (SUPs) by 2026**,
- Promote **Extended Producer Responsibility (EPR)** schemes,
- Encourage **eco-friendly product design**, and
- Increase **plastic waste recycling rates** by 50%.

Although the plan does not explicitly mention phthalates or bisphenols, its focus on **reducing hazardous additives** and promoting **safe material substitution** directly supports their phase-out. The framework also encourages the **private sector** to innovate safer, non-toxic packaging and consumer goods.
(Source: Department of Environment, Government of Bangladesh.)

5. Judicial Directives and Policy Enforcement

The **High Court Division of Bangladesh** has repeatedly reinforced the urgency of plastic control through landmark rulings. In **January 2020**, the Court ordered the **government to ban single-use plastics nationwide** by 2021 and to **enforce the 2002 polythene bag prohibition immediately**. Later rulings (2022–2023) mandated bans on SUPs in **13 coastal districts** and directed regulatory bodies to prepare **roadmaps for eliminating toxic plastic materials**.

Civil-society organizations such as **BELA** and **ESDO** have leveraged these rulings to expand the national dialogue beyond waste management, emphasizing **chemical safety and human health impacts** associated with plastic additives. These judicial interventions have created a **legal framework for progressive plastic policy reforms** that could extend to **phthalate and bisphenol phase-outs**.

6. Industry and Private Sector Engagement

Some early efforts toward voluntary chemical phase-out are emerging within Bangladesh's **retail and export sectors**.

- Several **supermarket chains in Dhaka** (including Shwapno and Meena Bazar) have begun exploring **BPA-free receipt paper** following ESDO's campaign.
- Export-oriented manufacturers in the **garment and packaging industries** are moving toward **phthalate-free inks and coatings** to comply with EU buyer requirements under REACH. These industry shifts, though still limited, demonstrate a growing **market-driven demand** for safer materials and align Bangladesh's industries with **global supply chain standards**.

While Bangladesh has yet to establish a **comprehensive national phase-out strategy** for bisphenols and phthalates, its evolving **policy ecosystem, legal frameworks, and civil-society initiatives** represent meaningful progress. If implemented, these measures would position Bangladesh as a **regional leader in reducing plastic-associated toxic chemical risks**, bridging environmental and public health protection under one regulatory framework.

6.2. What are the main challenges in the process of campaigning for phasing out phthalates/bisphenols?

Despite growing scientific evidence and advocacy efforts, Bangladesh faces significant barriers to regulating and phasing out **phthalates** and **bisphenols**. These challenges are structural, economic, institutional, and cultural, making it difficult for policymakers and civil society to prioritize these chemicals within the broader environmental and public health agenda.

1. Lack of Explicit Regulation and Weak Enforcement

Bangladesh currently lacks **specific legal instruments** targeting phthalates and bisphenols as hazardous substances. Existing laws—such as the *Environment Conservation Act (1995)*, the *Environment Court Act (2010)*, and the *Plastic Waste Management Rules (draft, 2021)*—do not directly address chemical additives in plastics. While initiatives like the **October 2024 ban on polythene and polypropylene bags in supermarkets** mark progress, they focus on **product categories**, not the toxic components within them. Moreover, enforcement remains inconsistent even where bans exist. The 2002 prohibition on thin polythene bags, for instance, has been **poorly implemented for over two decades** due to weak monitoring, limited manpower, and corruption in enforcement chains. Without consistent enforcement, future chemical-specific restrictions—such as bans on **BPA in receipts** or **DEHP in packaging**—may face the same fate. This lack of regulatory teeth erodes public confidence and industry compliance.

2. Low Public Awareness and Limited Risk Communication

The **public understanding of chemical risks** associated with plastics remains extremely low. A 2019–2020 ESDO baseline survey found **0% awareness** of **Bisphenol A (BPA)** exposure from receipts, and similarly low recognition of phthalate hazards among parents, teachers, and consumers. Most people in Bangladesh perceive plastic as an **environmental waste issue**, not a **chemical health risk**.

This absence of awareness weakens grassroots advocacy. Without a strong base of informed consumers demanding safer alternatives, policymakers lack political pressure to act. In addition, limited **risk communication materials in Bengali** and inadequate media coverage of chemical health risks mean that even educated urban populations rarely connect everyday plastic use with hormonal, reproductive, or cancer risks.

3. Economic Dependence on Plastics and Chemical Additives

Bangladesh's economy is deeply intertwined with plastic manufacturing and trade. The country produces **around 390,000 tonnes of plastic products annually**, serving both domestic and export markets. Sectors such as **packaging, garments, construction, electronics, toys, and stationery** rely heavily on **plasticizers (phthalates)** and **stabilizers (bisphenols)** to improve product flexibility, durability, and clarity.

Phthalates and bisphenols remain **cheap, versatile, and accessible**, while safer substitutes—such as adipates, citrates, or non-phenolic resins—are **costlier and less available locally**. For

manufacturers already struggling with thin profit margins and import costs, switching to safer alternatives is seen as financially burdensome. This creates **resistance from industry associations** whenever new chemical restrictions are proposed.

Additionally, Bangladesh imports large quantities of **plastic raw materials, recycled pellets, and finished products** from China, India, and Malaysia—countries that still use these additives extensively. Without regional harmonization of chemical standards, Bangladesh faces difficulty enforcing bans on imported goods containing phthalates or bisphenols.

4. Limited Research, Data, and Technical Capacity

The evidence base on **phthalate and bisphenol exposure in Bangladesh** is growing but remains insufficient. To date, only a handful of studies exist—covering contamination in **rivers (2023)**, **school erasers (2022)**, **thermal receipts (2022)**, **fish (2023)**, and **human serum (2024)**. There is **no national biomonitoring program** for tracking these chemicals in blood, urine, or breast milk, and no national database for tracking their import, use, or environmental release.

This lack of longitudinal data weakens advocacy. Policymakers often require **local evidence of health impacts and exposure levels** before enacting new chemical controls. Furthermore, Bangladesh's laboratories have limited capacity for **phthalate and bisphenol analysis**, especially for detecting trace concentrations across complex matrices like food, water, and human tissues. This limits both public health surveillance and enforcement of migration standards once regulations are passed.

Without sustained investment in **analytical infrastructure, toxicological studies, and human biomonitoring**, it will remain difficult to demonstrate the scale of the problem or evaluate the effectiveness of interventions.

5. Fragmented and Overlapping Regulatory Framework

Chemical safety governance in Bangladesh is **spread across multiple agencies**, each with limited coordination or clear mandates:

- The **Department of Environment (DoE)** oversees environmental pollution and waste management;
- The **Bangladesh Standards and Testing Institution (BSTI)** regulates product safety and labeling;
- The **Bangladesh Food Safety Authority (BFSA)** governs food-contact materials;
- The **Ministry of Industries** and **Ministry of Commerce** manage imports and industrial policy;
- The **Ministry of Health and Family Welfare (MoHFW)** is responsible for public health impacts.

This fragmented structure leads to **regulatory gaps, duplication of efforts, and slow policy formulation**. For instance, while the draft *Food Contact Materials (FCM) Regulation 2024* lists BPA and DEHP under migration limits, enforcement will depend on DoE's monitoring capacity, which remains under-resourced.

Unlike the European Union, Bangladesh lacks an integrated **chemical management framework** such as **REACH** that could unify oversight of hazardous substances across products and sectors. Consequently, campaigns must navigate complex bureaucratic pathways, often resulting in **policy inertia and slow adoption** of chemical controls.

6. International Trade and Industry Pressure

Bangladesh's export-oriented economy—especially in **ready-made garments (RMG)**, **packaging**, and **leather goods**—faces competing priorities. While international buyers (notably in the EU and North America) increasingly require **"BPA-free"** and **"phthalate-free"** certifications, domestic manufacturers are reluctant to reform due to the **cost of compliance** and **weak local enforcement**.

Industries often argue that phthalate- and bisphenol-free production will raise costs and reduce competitiveness, especially for **small and medium enterprises (SMEs)** supplying the domestic market. Regulators are also hesitant to impose strict chemical restrictions, fearing it could **disrupt exports, raise consumer prices, or strain trade relationships**.

This dynamic creates a **policy contradiction**: Bangladesh seeks to meet international sustainability commitments under the **Global Plastics Treaty** and **SDG 12 (Responsible Consumption and Production)**, yet continues to allow domestic production and import of plastics laden with hazardous additives.

7. Limited Integration Between Environmental and Health Agendas

Phthalates and bisphenols are **endocrine-disrupting chemicals (EDCs)** with links to hormonal, reproductive, and developmental disorders. However, the country's environmental and health agencies seldom coordinate on chemical exposure issues. Environmental policy tends to focus on **waste management and pollution**, while public health policy centers on **infectious diseases, malnutrition, and maternal health**—leaving chemical exposures under-addressed.

As a result, **chemical safety lacks visibility in national health strategies**, and medical professionals receive little training on diagnosing or reporting chemical-related illnesses. This disconnect prevents phthalate and bisphenol exposure from being recognized as a **public health priority**, limiting funding and political will for regulation.

8. Weak Civil Society and Resource Constraints

Although NGOs like **ESDO** have been instrumental in exposing chemical risks, the **scope of advocacy remains limited** by funding and capacity constraints. There are few organizations with the technical expertise to analyze chemical exposure data or conduct toxicological research. Campaigns depend heavily on donor-driven project cycles, making sustained pressure difficult once funding ends.

The private sector's dominance in media and retail further restricts access to awareness channels. Without consistent communication, advocacy campaigns struggle to maintain public attention beyond short bursts following report releases.

6.3. Recommendations and project ideas to support national regulation of phthalates/bisphenols

Bangladesh has begun taking important steps to address plastic pollution—such as banning plastic bags in supermarkets (October 2024) and drafting the *Food Contact Materials (FCM) Regulation* that mentions BPA and DEHP. However, there are still **no comprehensive national policies** that specifically target **phthalates** or **bisphenols** as chemical groups.

Given the documented presence of these substances in the environment, consumer goods, and even human samples, immediate and coordinated actions are needed to protect public health and align Bangladesh with global chemical safety standards. The following recommendations and project ideas are proposed to guide government agencies, civil society, and development partners.

1. Strengthen National Regulation

Bangladesh urgently needs a **chemical-specific legal framework** to address phthalates and bisphenols. The government should:

- **Amend the Environment Conservation Rules (1997)** or issue a new **Toxic Additives Regulation** to list phthalates (DEHP, DBP, BBP, DINP, DIDP, DIBP) and bisphenols (BPA, BPS, BPF) as *restricted substances*.
- Build on the draft *Food Contact Materials Regulation (2024–2025)* by expanding it to cover **all food-contact plastics**, including bottles, lunch boxes, and films, and to enforce **migration limits** consistent with EU standards.
- Introduce **mandatory product labeling**—requiring manufacturers and importers to declare "BPA-free" or "phthalate-free" status on toys, childcare items, and school supplies.
- Establish a **cross-ministerial working group** under the Department of Environment (DoE), involving the Bangladesh Food Safety Authority (BFSA), Bangladesh Standards and Testing Institution (BSTI), and Ministry of Health and Family Welfare (MoHFW), to coordinate on chemical safety regulation.

This approach would provide a unified framework similar to the **EU REACH Regulation**, enabling Bangladesh to systematically regulate harmful additives rather than addressing them piecemeal through product bans.

2. Establish Biomonitoring and Research Programs

Scientific data on chemical exposure in Bangladesh is currently limited to a few studies on rivers, consumer goods, and breast cancer correlations. To inform evidence-based policymaking, the country needs a **national biomonitoring and research program** that:

- Measures **phthalate and bisphenol levels** in human biological samples (urine, blood, breast milk) among **children, women, and occupationally exposed groups** such as cashiers and factory workers.
- Conducts **product testing and environmental surveillance** for toys, packaging, fish, water, and air to identify contamination hotspots.

- Supports universities, public health institutions, and NGOs to establish **laboratory testing capabilities** for endocrine-disrupting chemicals (EDCs).
- Develops a **national database** on plastic additives, imports, and product safety compliance, linked to BSTI's certification systems.

This initiative could be supported by international donors such as UNEP, WHO, and the World Bank under global chemical management and plastic treaty programs.

3. Public Awareness and Consumer Education

Low public understanding of toxic additives remains one of the biggest barriers to change. Effective **awareness and communication campaigns** can create the social pressure needed for regulatory reform. Recommended actions include:

- **School-based education programs** that teach children, teachers, and parents about chemical safety, focusing on the dangers of chewing erasers, using cheap plastic toys, and reheating food in plastic containers.
- **Mass media campaigns** using television, radio, and social media to connect toxic plastics to **health risks such as cancer, infertility, and hormonal disorders**, framed in simple and relatable Bengali language.
- **Public exhibitions and interactive events** (e.g., "Safe Plastic Week") to promote BPA-free and phthalate-free consumer choices.
- Partnership with health professionals to develop **awareness materials for women**, especially pregnant mothers and workers handling receipts.

When public understanding and demand grow, industries and regulators are more likely to act.

4. Legal and Policy Advocacy

Advocacy groups and NGOs should capitalize on the **momentum from the 2024 supermarket plastic bag ban** and the ongoing **High Court directives** on plastic control to push for chemical-specific policies.

- Advocate for the **inclusion of phthalates and bisphenols** in the *National Action Plan for Sustainable Plastic Management (2020–2030)* and the upcoming **Chemical Safety Policy** under the DoE.
- Lobby for Bangladesh to take an active role in **Global Plastics Treaty negotiations**, emphasizing the need for **toxic additive phase-outs** as part of global plastic reduction strategies.
- Organize **multi-stakeholder dialogues** between government agencies, academia, and industry to co-develop practical regulatory roadmaps and alternatives.
- Develop **training modules for regulators and inspectors** to monitor chemical content in consumer goods and enforce standards effectively.

Strong advocacy backed by evidence and coalition-building will ensure that policy reforms translate into concrete actions.

Project Idea: "Toxic-Free Plastics for Bangladesh"

Goal:
To reduce and ultimately phase out **phthalates and bisphenols** from consumer products in Bangladesh through research, advocacy, and stakeholder collaboration.

Overview:
This project would serve as a **national flagship initiative** bringing together government agencies, academia, civil society, and the private sector to advance chemical safety and protect public health. It would combine **research, public education, policy development, and industry engagement** under one coordinated program.

Key Components:

1. **Research and Evidence Generation**

- Conduct nationwide testing of plastic consumer goods (toys, school supplies, food packaging, receipts) to determine phthalate and bisphenol content.
- Launch human biomonitoring studies in collaboration with universities and health institutes to measure exposure in **children, women, and retail workers**.
- Publish an annual "**Toxic Plastics Watch Report**" to track progress and raise awareness among policymakers and the public.

2. **Public Awareness and Communication**

- Develop a multimedia campaign titled *"Toxin-Free Bangladesh"*, featuring television spots, radio jingles, and social media content in Bengali.
- Organize community events, school sessions, and public exhibitions showcasing BPA-free and phthalate-free alternatives.
- Distribute educational materials in hospitals, schools, and retail stores to inform consumers and workers.

3. **Policy and Regulatory Development**

- Draft a **model regulation** based on EU standards for restricted substances in plastics and present it to the **Ministry of Health**, **DoE**, and **BFSA** for consideration.
- Support the formation of a **National Chemical Safety Coordination Committee** to oversee implementation.
- Provide **training and technical assistance** to government agencies on product testing, import inspection, and migration analysis.

4. **Industry Engagement and Safer Alternatives**

- Partner with manufacturers, supermarkets, and importers to pilot **BPA-free receipts** and **phthalate-free packaging**.

- Establish a voluntary **“Safe Plastics Certification”** program recognizing compliant companies.
- Encourage public procurement policies that favor toxic-free materials in schools, hospitals, and government offices.

Expected Outcomes:

- National recognition of phthalates and bisphenols as hazardous additives.
- Strengthened chemical safety regulations and testing infrastructure.
- Increased public awareness and demand for safer products.
- Adoption of safer production and import practices by the private sector.

Timeline:
3 years (2025–2028) — with **Year 1** focusing on research and policy groundwork, **Year 2** on awareness and pilot projects, and **Year 3** on regulatory adoption and scaling up.

Bangladesh stands at a critical juncture in addressing plastic-related chemical pollution. The actions proposed—combining **policy reform, public awareness, scientific research, and stakeholder collaboration**—would move the country toward a **toxic-free, circular economy**. Implementing the “Toxic-Free Plastics for Bangladesh” project would not only safeguard public health but also strengthen the country’s international reputation as a regional leader in responsible plastic management and chemical safety.