Gap Analysis of Lead Standards in Paint: Bangladesh

Environment and Social Development Organization, 2024

CONTENTS

Executive Summary 2
Key Findings 2
The Path Forward 3
Call to Action 3
Context and Background 4
Objectives of the Gap Analysis 6
Methodology 6
Overview of Industrial Paint 9
Current State of Standard of Lead in Paint 14
Findings from the Gap Analysis 19
Technical Assessment and Discussion 24
Recommendations 27
Way Forward 30
Conclusion 34

EXECUTIVE SUMMARY

Lead contamination in paints represents a silent crisis in Bangladesh, affecting health, the environment, and economic stability. While the global community advances toward eliminating lead from paints, Bangladesh struggles with significant gaps in regulation, infrastructure, awareness, and enforcement. This issue disproportionately impacts vulnerable populations, including children, workers, and communities near informal production and recycling centers. The consequences are staggering: lead poisoning contributes to neurological and developmental disorders, chronic illnesses, and environmental degradation, with costs borne by individuals and society at large.

This report is the culmination of extensive desk reviews, Key Informant Interviews (KIIs), workshops, and field assessments aimed at understanding the challenges and proposing a comprehensive roadmap for change. The findings highlight a systemic failure to address lead contamination in both decorative and industrial paints. While decorative paints are regulated with a standard of 90 ppm lead limit, enforcement remains weak. Industrial paints, however, operate in a regulatory vacuum, with no enforceable standards, allowing lead-laden products to dominate the market unchecked.

The lack of infrastructure compounds the problem. Testing facilities are limited and inaccessible, especially to rural and small-scale manufacturers. Waste management systems are inadequate, leading to hazardous disposal practices that pollute soil, water, and air. Workers in the paint manufacturing and recycling sectors operate without adequate protective equipment or training, exposing them to chronic health risks. Meanwhile, consumers remain largely unaware of the dangers of lead-based paints, perpetuating demand for cheaper, toxic alternatives.

Economic pressures further hinder progress. Transitioning to lead-free production is expensive, especially for small and medium enterprises (SMEs) that lack financial resources or incentives. The cost disparity between lead-free and lead-based materials discourages compliance, while the absence of government subsidies, tax reforms, or financial support perpetuates the status quo. There is a significant shortage of technical support and laboratory testing infrastructure, with existing facilities being inadequate to meet the required standards.

The environmental toll is equally alarming. Lead-based paints contribute to long-term contamination of ecosystems, affecting biodiversity and agricultural productivity. Improper disposal of hazardous waste exacerbates this, creating a cascading impact on both urban and rural communities.

KEY FINDINGS

1. **Regulatory Gaps**: Industrial paints lack enforceable standards, and decorative paints are poorly monitored due to limited enforcement capacity.
2. **Economic Challenges**: High costs of lead-free raw materials and lack of financial incentives deter manufacturers from transitioning to safer alternatives.
3. **Infrastructure Deficiencies**: Testing facilities operate at only 30% capacity, and mobile testing units are non-existent, hindering effective compliance monitoring.

4. **Waste Management Issues**: Improper disposal of lead-containing materials leads to significant environmental contamination.
5. **Low Awareness**: Manufacturers, workers, and consumers lack awareness about the risks of lead exposure and the benefits of lead-free paints.
6. **Health Impacts**: Lead poisoning causes irreversible cognitive and neurological damage in children and chronic illnesses in adults, disproportionately affecting vulnerable populations.
7. **Environmental Damage**: Lead pollution disrupts ecosystems, contaminates water and soil, and poses long-term risks to biodiversity and agriculture.
8. **Weak Customs Oversight**: Imported raw materials and finished products are poorly monitored, allowing non-compliant, high-lead-content products to flood the market.
9. **Lack of Technical Strength:** There is an insufficient number of qualified chemists and laboratory facilities, making meeting the necessary testing and analysis requirements challenging.

THE PATH FORWARD

This report provides a detailed action plan and roadmap to address these challenges and transition the paint industry in Bangladesh toward global standards of safety and sustainability. The recommendations focus on:

1. **Policy and Regulation**: Establish enforceable standards for industrial paints, strengthen BSTI's capacity, and introduce stricter penalties for non-compliance.
2. **Infrastructure Development**: Expand regional testing facilities, deploy mobile testing units, and improve waste management systems.
3. **Economic Interventions**: Introduce subsidies, tax reductions, and other financial incentives to encourage the production and use of lead-free paints.
4. **Awareness and Training**: Launch national campaigns to educate consumers, manufacturers, and workers about the dangers of lead and the benefits of lead-free alternatives.
5. **R&D Investments**: Develop cost-effective, lead-free alternatives through public-private partnerships and academic collaborations.
6. **Regional Cooperation:** Regional cooperation is essential to regulate the transboundary movement of lead-containing materials. Collaborative efforts can help establish unified standards, monitor cross-border activities, and reduce lead exposure.
7. **International Collaboration**: Benchmark policies against global best practices and leverage foreign aid and expertise for capacity building.

CALL TO ACTION

The stakes are high, but the rewards are immense. Eliminating lead from paints in Bangladesh is not just a regulatory necessity—it is a moral imperative to protect future generations. The success of this endeavor depends on coordinated action across government ministries, industries, civil society, and international partners. This report offers a comprehensive framework for change, urging immediate and sustained efforts to tackle this silent crisis. The time to act is now, to ensure healthier lives, a cleaner environment, and a sustainable future for all.

CONTEXT AND BACKGROUND

CONTEXT

Lead has historically been a key ingredient in paint formulations due to its ability to enhance durability, corrosion resistance, and faster drying. While its use has declined in many parts of the world due to well-documented health and environmental risks, lead-based paints remain prevalent in low- and middle-income countries, including Bangladesh. Despite growing awareness of its toxicity, industrial practices and weak regulatory frameworks have allowed lead to persist as a major component in paints, particularly in decorative and industrial applications.

The risks associated with lead-based paints extend beyond their production. As these paints age, they decay into chips and dust, contaminating the environment and indoor spaces. This is particularly problematic in residential areas, schools, and playgrounds, where children are exposed. Studies have shown that even minimal exposure to lead can cause severe developmental issues in children, as their growing bodies absorb lead more readily than adults.

Bangladesh has made some progress, including establishing a 90 parts per million (ppm) limit on lead in decorative paints. However, these regulations are not comprehensive, and industrial paints remain largely unregulated. Additionally, enforcement mechanisms are weak, and monitoring of compliance is sporadic. Many imported paints enter the market without thorough inspections for lead content, exacerbating the issue.

Globally, lead-based paints are recognized as a significant contributor to lead exposure, especially for children. After the successful elimination of leaded petrol in many regions, paints have emerged as one of the most prevalent sources of lead in the environment. According to the **Global Alliance to Eliminate Lead Paint**, over 100 countries still lack legally binding regulations on lead in paint, highlighting the need for robust international and national efforts.

HISTORICAL AND GLOBAL CONTEXT

The global understanding of lead toxicity has driven international bodies like the **World Health Organization (WHO)** and the **United Nations Environment Programme (UNEP)** to recommend strict regulations on lead in paints. The **Model Law and Guidance for Regulating Lead Paint**[1], developed by the UNEP, suggests a maximum lead content limit of 90 ppm, which is both technically feasible and protective of human health. Countries such as Thailand, the Philippines, and Indonesia have implemented such regulations and achieved significant reductions in lead-related health issues.

Despite these advancements, the informal manufacturing and recycling sectors in many countries, including Bangladesh, continue to produce and distribute lead-based products. Weak enforcement, limited public awareness, and financial constraints in transitioning to lead-free alternatives have further entrenched the use of lead in paints. These challenges are compounded by the lack of infrastructure for monitoring and testing lead content in paints.

[1] Model Law and Guidance for Regulating Lead Paint

In Bangladesh, lead exposure from paints remains a critical public health issue. Although the Bangladesh Standards and Testing Institution (BSTI) established a mandatory standard of **90 ppm** limit of lead for decorative paints, this regulation has not been extended to industrial paints, which often contain higher levels of lead due to their application in infrastructure projects, machinery, and other heavy-duty uses. The informal paint manufacturing sector, which lacks oversight, also contributes significantly to the problem.

Imported paints and raw materials further complicate the issue. Limited capacity to test and monitor these products means that high-lead paints often find their way into the Bangladeshi market. Additionally, industries and small-scale manufacturers often lack incentives or resources to transition to lead-free alternatives. The absence of green tax incentives and subsidies for safer manufacturing processes has made compliance with international standards economically challenging for many manufacturers.

PUBLIC HEALTH AND ENVIRONMENTAL IMPACT

Lead in paints is one of the leading sources of childhood lead exposure in Bangladesh. Children are particularly vulnerable due to their frequent hand-to-mouth activities, increasing the risk of ingesting lead-contaminated dust or flakes. Long-term exposure can lead to irreversible neurological damage, including cognitive deficits, reduced IQ, and behavioral disorders. Adults exposed to lead face risks such as hypertension, cardiovascular diseases, and kidney damage.

Environmentally, lead contamination disrupts ecosystems by leaching into soil and water systems, affecting biodiversity and agricultural productivity. Lead's persistence in the environment means that its harmful effects can last for decades, making it a significant barrier to achieving sustainable development goals in Bangladesh.

URGENCY OF ACTION

Addressing lead in paints is not only a public health imperative but also an economic and environmental necessity. The economic burden of lead exposure, including healthcare costs and productivity losses, is significant. The **Institute for Health Metrics and Evaluation (IHME)** estimated that lead exposure accounted for $977 billion in annual losses globally, with low- and middle-income countries bearing the highest burden. Action on transboundary movement is important because lead-containing materials, such as raw materials, paints, and waste, often cross borders, spreading the risks of lead contamination across multiple countries. Without coordinated regional efforts, high-lead products can enter markets with weaker regulations, undermining national efforts to eliminate lead in paints. Unified policies and monitoring are essential to prevent the import and export of non-compliant products, protect public health, and ensure environmental safety on a broader scale.

By aligning its policies with international standards and enhancing enforcement mechanisms, Bangladesh can reduce the health and environmental impacts of lead, fostering a safer and more sustainable future. The findings of this gap analysis aim to provide actionable insights to bridge the gaps in regulation, enforcement, and public awareness.

OBJECTIVES OF THE GAP ANALYSIS

The primary objectives of the gap analysis are to:

1. **Assess Current Frameworks**:
   - ✓ Review existing laws, standards, and enforcement mechanisms in Bangladesh concerning lead in decorative and industrial paints.
   - ✓ Identify gaps in regulation, particularly concerning industrial paints, imported products, and informal manufacturing sectors.
2. **Compare with International Standards**:
   - ✓ Evaluate Bangladesh's frameworks against global best practices, such as those outlined in the **Model Law and Guidance for Regulating Lead Paint** by the **UNEP Lead Paint Alliance**.
3. **Stakeholder Engagement**:
   - ✓ Incorporate insights from government agencies, industries, and civil society to identify implementation challenges and opportunities.
4. **Develop Recommendations**:
   - ✓ Propose actionable steps to create comprehensive paint standards and strengthen enforcement mechanisms.
   - ✓ Promote incentives for transitioning to lead-free paints.
5. **Raise Awareness**:
   - ✓ Highlight the health, environmental, and economic benefits of addressing lead in paints to foster public and industry support.

METHODOLOGY

The methodology adopted for this report was designed to provide a comprehensive understanding of the gaps in policies, regulations, and practices related to lead in paints in Bangladesh. The approach incorporated data collection and analysis, leveraging extensive desk reviews, direct stakeholder engagement, and collaborative workshops to derive actionable insights.

1. DESK REVIEW

An in-depth desk review was the foundational step, focusing on understanding the existing landscape and identifying gaps in regulations and practices. The review included:

- **Policy and Legal Frameworks**:
  - ✓ Analysis of existing laws and standards, including the Bangladesh Standards and Testing Institution's (BSTI) regulation limiting lead in decorative paints to 90 ppm.
  - ✓ Examination of the absence of similar regulations for industrial paints and monitoring mechanisms for imported products.
- **Global Best Practices**:
  - ✓ Comparative analysis of international standards such as the **Model Law and Guidance for Regulating Lead Paint** by UNEP and successful implementations in countries like Thailand, Indonesia, and the Philippines.

- ✓ Study of enforcement strategies and incentive models employed globally to facilitate transitions to lead-free paints.

- **Industry and Environmental Data**:
  - ✓ Secondary research on the socio-economic and environmental impacts of lead-based paints.
  - ✓ Review of prior studies and reports on lead exposure in Bangladesh, including its health implications and environmental footprint.

2. KEY INFORMANT INTERVIEWS (KII)

Key Informant Interviews were conducted with a diverse range of stakeholders directly involved in or affected by the production, regulation, and use of lead-based paints. These interviews aimed to gain nuanced, ground-level insights into the challenges and opportunities for improving lead paint standards. Stakeholder groups included:

- **Paint Manufacturers and Associations**:
  - ✓ Discussion on current practices, awareness of global standards, and challenges in transitioning to lead-free manufacturing.
  - ✓ Exploration of the economic and logistical barriers to adopting alternative raw materials.
- **Industry Workers**:
  - ✓ Understanding occupational exposure to lead and the availability of safety measures.
  - ✓ Workers' awareness of the health risks and suggestions for workplace improvements.
- **Surrounding Communities**:
  - ✓ Insights into environmental impacts and health outcomes resulting from proximity to paint manufacturing and recycling facilities.
  - ✓ Community-level awareness of lead contamination and mitigation measures.
- **Business Owners**:
  - ✓ Perspectives on informal paint manufacturing, challenges in formalization, and their readiness to comply with new regulations.

3. STAKEHOLDER WORKSHOPS

Workshops were organized to gather insights, foster collaboration, and develop actionable recommendations. These workshops included participants from diverse stakeholder groups, ensuring a holistic view of the issue. Activities within the workshops included:

- **Focused Group Discussions (FGDs)**:
  - ✓ Small thematic groups were formed to discuss specific topics such as regulatory gaps, industrial paint standards, and occupational health practices.
  - ✓ Participants included paint manufacturers, industry associations, workers, community representatives, and government officials.
- **Recommendation Development**:
  - ✓ Stakeholders collaboratively developed draft recommendations for improving paint standards, enforcement mechanisms, and stakeholder engagement.

- ✓ Discussions highlighted the economic implications of regulatory changes and proposed incentive structures, such as green tax initiatives and subsidies for lead-free production.

- **Feedback Mechanisms**:
  - ✓ Participants provided input on draft findings and policy suggestions, ensuring that proposed solutions were both practical and relevant.

4. DATA COLLECTION AND VALIDATION

The findings from the desk review, KIIs, and workshops were systematically synthesized and validated through the following processes:

- **Thematic Analysis**:
  - Identification of recurring themes and patterns, categorizing them into key focus areas such as regulatory challenges, health risks, and industry compliance.
- **Stakeholder Verification**:
  - Preliminary findings and recommendations were shared with key stakeholders for validation and feedback, ensuring alignment with ground realities and stakeholder priorities.

5. ANALYTICAL FRAMEWORK

A structured analytical framework was used to assess and address the identified gaps:

- **Regulatory Gap Analysis**:
  - Systematic evaluation of existing policies, enforcement mechanisms, and monitoring capacities.
  - Identification of specific areas where regulations are lacking or ineffective, particularly in industrial paints and informal manufacturing.
- **Stakeholder Engagement and Impact Assessment**:
  - Analysis of insights from manufacturers, workers, and communities to assess the practical implications of proposed regulatory changes.
- **International Benchmarking**:
  - Alignment of findings with global best practices to propose actionable recommendations for policy and regulatory improvements.

OVERVIEW OF INDUSTRIAL PAINT

WHAT IS INDUSTRIAL PAINT?

Industrial paint is a type of coating that comes in liquid, paste, or powder form. When applied to a surface, it undergoes a curing process, which means it hardens and becomes a solid, protective layer. This layer not only protects the surface from damage but can also add color and decoration. Essentially, it transforms from a wet substance into a strong, durable film that keeps things looking good and working well[2].

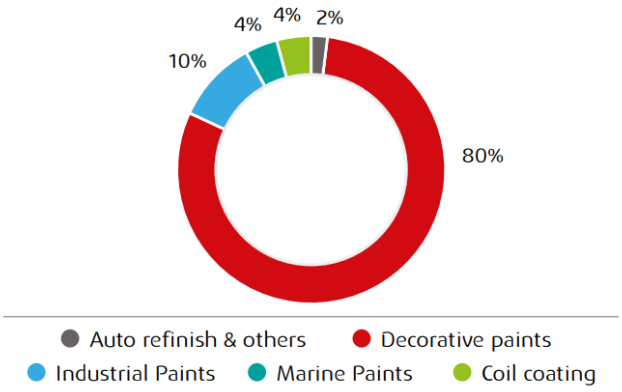


Figure 1: Paint Usage Categories in Bangladesh[3]

The Bangladeshi paint and coating market is vibrant and competitive, with a mix of strong local and international brands contributing to its growth.

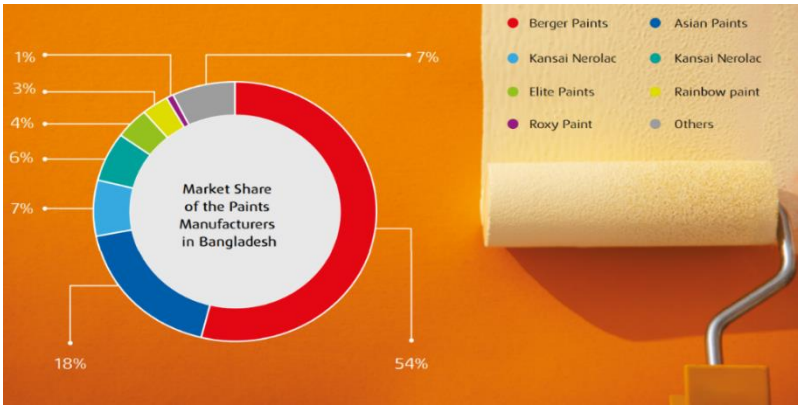


Figure 2: Market Share of the Paints Manufacturers in Bangladesh[4]

[2] https://www.bernardoecenarro.com/en/besa-lab/industrial-paint-types-and-characteristics/#:~:text=the%20drying%20process-,What%20is%20industrial%20paint%3F,protects%20and%2For%20decorates%20simultaneously

[3] https://idlc.com/mbr/images/public/x4E1IK7ot705L2odjftD3l.pdf

[4] https://www.coatingsworld.com/issues/2020-10-01/view_india_asia_pacific_reports/the-paint-and-coatings-industry-in-bangladesh/

Places where Industrial Paints are used:

- Exterior Surfaces
- Interior Walls and Ceilings
- Machinery and Equipment
- Floors and Surfaces
- Tanks and Pipelines
- Structural Steel and Metalwork
- Concrete Surfaces
- Electrical Equipment and Enclosures

TYPES OF CHEMICALS AND COATING USED IN INDUSTRIAL PAINTS:

- **Polyurethane coatings** are known for their abrasion resistance and high-gloss finish. There are two types: aliphatic, which are UV-resistant and suitable for outdoor use, and aromatic, which perform better underwater but can degrade in sunlight. However, these coatings contain harmful chemicals, so protective gear is essential during application.
- **Epoxy resin coatings** offer strong adhesion and can withstand harsh conditions, with some formulations resistant to temperatures up to 1,400°F. They are often used with zinc primers for added corrosion protection and are ideal for submerged surfaces.
- **Alkyd coatings** are moisture-resistant and can be tailored for different conditions, though they are less durable than polyurethanes and epoxies. They take longer to dry, but heat can speed up the process.
- **Zinc-rich coatings** come in organic and inorganic types. They protect steel by sacrificing zinc to prevent corrosion and are often used as primers in multi-coat systems.
- **Acrylic coatings** are quick-drying, offer a high-gloss finish, and improve corrosion resistance. They are suitable for various substrates, including metal and roofing materials.
- **Ceramic coatings** provide durability, thermal insulation, and chemical stability, protecting against UV rays and high temperatures. However, they should not be used on surfaces exposed to stress.
- **Intumescent coatings** expand when exposed to heat, forming a protective foam layer that helps maintain structural integrity in high-heat situations, making them ideal for fire protection.

Overall, these coatings enhance durability and appearance while helping to reduce corrosion costs in industrial applications[5].

TYPICAL COMPOSITION OF INDUSTRIAL PAINTS:

[5] https://www.indinspect.com/blogs/7-common-types-of-industrial-coatings-and-their-uses/

Chemical	Types
Binders	Epoxy resins, polyurethane, alkyd, acrylic etc.
Solvent	Water (for water-based paints) or organic solvents like toluene, xylene, or acetone.
Pigment	**Lead chromate pigments (bright yellow[6])**, titanium dioxide (white), iron oxide (red, yellow, black), carbon black, etc
Additives	Surfactant, thickeners, biocide, antifoams etc.

Source: The Essential Chemical Industry

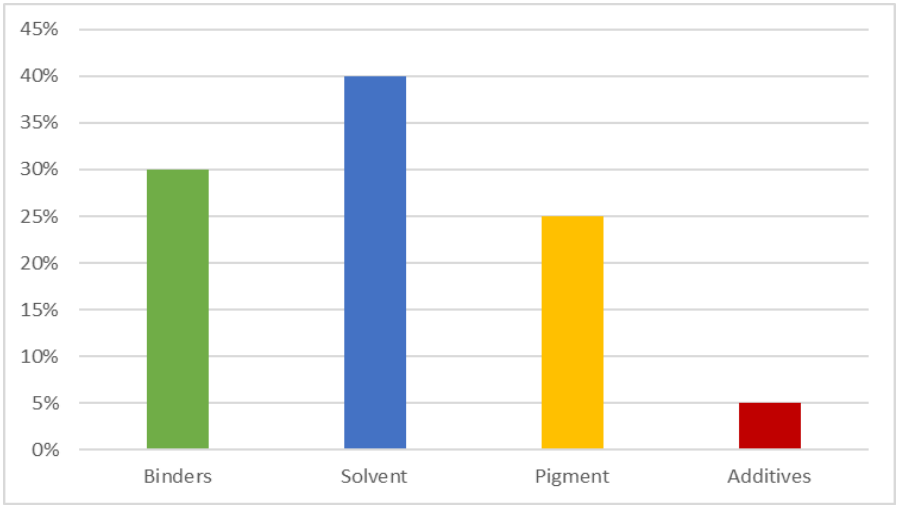


Figure 3: Composition of Industrial Paints

HARMFUL EFFECTS OF INDUSTRIAL PAINTS:

Paint contains volatile organic compounds (VOCs), heavy metals, and various other chemicals. These substances can lead to health problems and environmental harm.

Health Risks

- **VOCs:** Headaches, dizziness, nausea and vomiting, and irritation of eyes, nose or throat. Cancer, central nervous disorders, liver and kidney damage.
- **Binder:** Risk of cancer, reproductive impairment, cognitive deficits, and obesity. *Epoxy resins are the most common binders. Epoxy products cause allergic skin disease,*

[6] https://doi.org/10.3389/fpubh.2015.00144

especially among workers in the construction industry using the binders. Workers who already have acquired an epoxy allergy will be faced with a stronger reaction after each contact next time. Furthermore, epoxy chemicals may also cause airway and eye irritation, and if serious, may even lead to cancers or diseases of the reproductive system. Epichlorohydrin, an ingredient in epoxy resin, can cause skin allergies and is labelled as a probable human carcinogen in the EU. Bisphenol-A, another component, can also cause skin allergies and is harmful to reproduction, with weak estrogen-like effects.

- **Biocides:** Skin, eyes, and throat irritation, or even cancer.
- **Pigments:** Pigments containing **lead** can cause lead poisoning in blood. In 2012, the U.S. National Toxicology Program (NTP) conducted a comprehensive review of the health effects of low-level lead exposure. They concluded that blood lead levels below 5 µg/dL in children are linked to an increased diagnosis of attention-related behavioural issues, a higher incidence of problem behaviours, and reduced cognitive performance. In adults, similar levels were associated with decreased kidney function, while levels under 10 µg/dL were connected to neurocognitive decline[5].

Environmental Impact

- **VOCs:** Ozone and PAN formation.
- **Binder:** They can accumulate in environments with high organic matter, like sewage sludge and river sediments. Their effects on hormones can lead to the feminization of aquatic organisms and decreased male fertility, causing significant changes in the aquatic ecosystem.
- **Biocides:** There are environmental concerns associated with these coatings. For example, antimicrobial coatings can release active ingredients like silver and copper into the environment. These substances may harm fish, which could then be consumed by humans, leading to long-term environmental issues[7].
- **Pigments:** Several waste streams, including spent acid and metal sulfates, emanate from the manufacturing process, each of which carries an environmental impact.[8]

These chemicals can also find their ways into water bodies and pollute them.

DATA REGARDING ENVIRONMENTAL IMPACTS OF INDUSTRIAL PAINTS

Paint significantly contributes to environmental pollution through the emission of volatile organic compounds (VOCs) and hazardous waste.

- It is the largest source of microplastics in the ocean, contributing 1.9 million tonnes (58%) annually.

[7] https://nhsjs.com/2023/the-environmental-and-health-impact-of-paint-products/#:~:text=

[8] https://doi.org/10.29121/granthaalayah.v3.i9se.2015.3204

- The architectural sector is the biggest contributor to ocean leakage, accounting for 48% of the total.
- Additionally, wear and tear from maintaining commercial ships and offshore rigs contributes 18%.
- Each oil rig releases about 1,100 kg of paint microplastics and 260 kg of heavy metals into the ocean each year.
- Mismanaged waste accounts for over a third (37%) of ocean leakage.
- In North America, paint represents 22% of ocean microplastics, while in the Asia-Pacific region, it contributes 54% of total leakage[9].

IMPACT OF INDUSTRIAL PAINT ON CLIMATE

The paint industry significantly impacts the climate, with CO_2 emissions a significant concern. A 5-litre gallon of paint can produce 13.58 kg of CO_2 equivalent (CO_2e), which measures how much heat a greenhouse gas traps in the atmosphere compared to CO_2 over a specific time period. For example, The production of titanium dioxide, a common pigment in paint, accounts for nearly 75% of the carbon footprint of a tin of paint.

Eventually, emissions of GHGs released by industrial paints can increase heat and cause climate change.

Overall, implementing a strict **90-ppm** limit for hazardous substances in industrial paints is a critical step to prevent escalating health and environmental crises. Industrial paints contain a complex mix of binders (30%), solvents (40%), pigments (25%), and additives (5%)—many of which are highly toxic. Epoxy resins and polyurethane, commonly used as binders, can cause cancer, skin allergies, and reproductive harm, posing severe risks to workers and users. Organic solvents like toluene and xylene emit volatile organic compounds (VOCs) that lead to air pollution, respiratory illnesses, and neurological damage. Furthermore, pigments such as lead chromate and titanium dioxide are toxic, with lead-based pigments posing a direct risk of lead poisoning, especially to children. The environmental impact is equally severe, as these chemicals contribute to microplastic pollution, marine contamination, and a high carbon footprint, particularly from titanium dioxide production. Enforcing a **90-ppm** limit would substantially reduce these risks, safeguarding human health, protecting ecosystems, and contributing to climate resilience.

[9] https://www.greenmatch.co.uk/blog/is-paint-bad-for-the-environment

CURRENT STATE OF STANDARD OF LEAD IN PAINT

Lead is a toxic heavy metal that is harmful to human health and the environment. There is no minimum level that considers lead safe exposure limit according to the **World Health Organization**. The production, use, and disposal of lead paint amounts to a significant threat to workers, the environment, and public health. Even the scientific evidence shows that the low level of exposure caused a serious threat to a child's neurotoxic development. As a result, highly industrialized countries started banning lead in paints in the 70's and 80's. Considering the risk, the global think tanks raised their voice in 2002's World Summit on Sustainable Development. Lead components are preliminary used in solvent-based paints as pigments to provide color or prevent corrosion of metal surfaces known as drying agents. Lead has been detected in water-based paint as well though the data is not adequate as preference.

Lead paints are often categorized into decorative and industrial paint or consumer and non-consumer use. As there is a lack of agreed definition among those categorized usually the manufacturer takes the advantage of using industrial paint among the consumer's daily use-circle. For example, the use of paint in cars or children's toys. In the absence of legal restrictions on industrial application as well as enforcement mechanisms in decorative categories, the rights to live in a safe and pollution-free environment of a human being have constantly been violated. The concrete solution is to provide a binding legal framework that can influence the manufacturer and importer toward lead-free trading as well as limit the lead level for gradual phase-out.

EXISTING PAINT STANDARDS

In Bangladesh, the **Bangladesh Standards and Testing Institution (BSTI)** is the primary regulatory authority overseeing standards for paints. Currently, BSTI mandates that decorative paints sold in the country must not exceed a lead content of **90 parts per million (ppm)**. This regulation aligns with the international best practice limit set by the **Global Alliance to Eliminate Lead Paint**. However, the regulation specifically applies to **decorative paints** used in homes, schools, and other indoor environments.

Despite this regulation, significant issues remain:

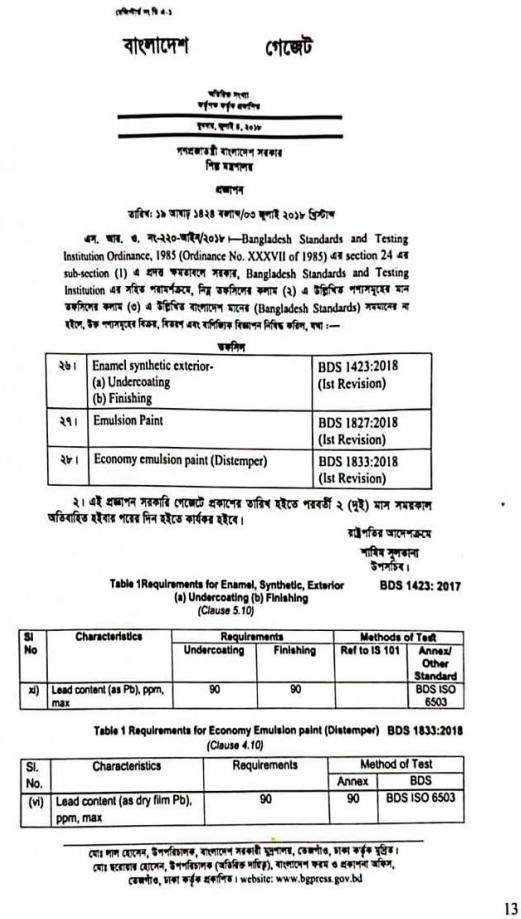
1. **Limited Scope of Regulation**: The current standards do not cover **industrial paints**, which often contain higher concentrations of lead due to their application in infrastructure projects, heavy machinery, and marine coatings. Industrial paints are not legally bound by the 90 ppm limit.
2. **Enforcement Mechanisms**: While the 90 ppm limit exists, enforcement is inconsistent. Many small-scale and informal manufacturers operate outside the purview of BSTI, producing or importing high-lead-content paints.
3. **Imported Paints**: A large proportion of paints in Bangladesh are imported. Weak customs enforcement and lack of mandatory lead testing for imports allow paints with high lead content to enter the market.

STATUS OF INDUSTRIAL PAINT REGULATIONS

Bangladesh does not have binding regulations on lead content in **industrial paints**. This gap is critical because industrial paints are widely used in applications such as:

- **Metal structures** (bridges, pipelines, and ships).
- **Concrete coatings** for roads and buildings.
- **Heavy machinery** and marine environments.

Industrial paints are often sold without clear labeling regarding their lead content. In the absence of regulation, there is no monitoring of lead levels in industrial paints or restrictions on their application. The lack of standards also impacts occupational safety, as workers in industries applying these paints are exposed to high levels of lead during production, application, and removal processes.



বাংলাদেশ গেজেট

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
শিল্প মন্ত্রণালয়

প্রজ্ঞাপন

তারিখ: ১৯ আষাঢ় ১৪২৪ বঙ্গাব্দ/০৩ জুলাই ২০১৮ খ্রিস্টাব্দ

এস, আর, ও, নং-২২০-আইন/২০১৮।—Bangladesh Standards and Testing Institution Ordinance, 1985 (Ordinance No. XXXVII of 1985) এর section 24 এর sub-section (1) এ প্রদত্ত ক্ষমতাবলে সরকার, Bangladesh Standards and Testing Institution এর সহিত পরামর্শক্রমে, শিল্প তফসিলের কলাম (২) এ উল্লিখিত পণ্যসমূহের মান তফসিলের কলাম (৩) এ উল্লিখিত বাংলাদেশ মানের (Bangladesh Standards) সমমানের না হইলে, উক্ত পণ্যসমূহের বিক্রয়, বিতরণ এবং বাণিজ্যিক বিজ্ঞাপন নিম্নরূপ করিল, যথা :—

তফসিল

২৬।	Enamel synthetic exterior- (a) Undercoating (b) Finishing	BDS 1423:2018 (1st Revision)
২৭।	Emulsion Paint	BDS 1827:2018 (1st Revision)
২৮।	Economy emulsion paint (Distemper)	BDS 1833:2018 (1st Revision)

২। এই প্রজ্ঞাপন সরকারি গেজেটে প্রকাশের তারিখ হইতে পরবর্তী ২ (দুই) মাস সময়কাল অতিবাহিত হইবার পরের দিন হইতে কার্যকর হইবে।

রাষ্ট্রপতির আদেশক্রমে
শামিম সুলতানা
উপসচিব।

Table 1Requirements for Enamel, Synthetic, Exterior (a) Undercoating (b) Finishing (Clause 5.10) BDS 1423: 2017

Sl No	Characteristics	Requirements		Methods of Test	
		Undercoating	Finishing	Ref to IS 101	Annex/ Other Standard
xi)	Lead content (as Pb), ppm, max	90	90		BDS ISO 6503

Table 1 Requirements for Economy Emulsion paint (Distemper) BDS 1833:2018 (Clause 4.10)

Sl. No.	Characteristics	Requirements	Method of Test	
			Annex	BDS
(vi)	Lead content (as dry film Pb), ppm, max	90	90	BDS ISO 6503

মোঃ শাল হোসেন, উপপরিচালক, বাংলাদেশ সরকারী মুদ্রণালয়, তেজগাঁও, ঢাকা কর্তৃক মুদ্রিত।
মোঃ ফরহাদ হোসেন, উপপরিচালক (অতিরিক্ত দায়িত্ব), বাংলাদেশ ফরম ও প্রকাশনা অফিস, তেজগাঁও, ঢাকা কর্তৃক প্রকাশিত। website: www.bgpress.gov.bd

13

BSTI mandates a **90 ppm lead limit for decorative paints**, which is in line with global standards. However, this regulation is limited to domestically manufactured decorative paints and excludes industrial paints. Bangladesh has limited testing facilities to assess the lead content in paints, especially imported products. Customs officials rarely test imported paints for compliance. Small-scale manufacturers and the informal sector, which contribute significantly to the paint market, are not effectively monitored. Regulatory bodies lack the resources and infrastructure to conduct routine inspections of paint production facilities and retail outlets.

There are no financial incentives for manufacturers to transition to lead-free alternatives. The absence of green tax policies or subsidies for reformulation hinders progress in adopting safer production methods. Imported paints, which constitute a large share of the Bangladeshi market, are not rigorously tested for lead content. Loopholes in customs policies allow high-lead-content paints to enter the country without adequate scrutiny. Inadequate and improper lab facilities is also one of the lackings here.

COMPARISON WITH INTERNATIONAL BEST PRACTICES

Globally, many countries have implemented comprehensive regulations to eliminate lead from all types of paints. Bangladesh's current regulatory framework lags behind these international standards:

1. **United States**:

- Lead Renovation, Repair and Painting Program Rules[10]

These rules aim to protect the public from lead-based paint hazards associated with renovation, repair, and painting activities. These activities can create hazardous lead dust when surfaces with lead paint. In accordance with the rule, it requires workers to be certified and trained in the use of lead-safe work practices.

- Lead-based Paint Disclosure Rule (Section 1018 of Title X[11])

Under this rule, the sellers, landlords, property managers, and real estate agents must disclose the presence of lead-based paints in houses that were built before 1978. The buyers and renter can also request an independent lead inspection.

- Consumer Products with Lead[12]

The Consumer Product Safety Commission has established rules to prohibit unsafe levels of lead in paint and children's products.

2. **European Union (EU)**: According to the EU's Registration, Evaluation, Authorization, and Restrictions of Chemicals (REACH [13]) Annex XVII [14] the manufacturing, and distribution of lead paint is strictly prohibited. While the EU has a robust framework against lead in paints but the old buildings during demolition or renovation activities, release large particles of lead in air. Other than that, the recent report demonstrates though EU banned the use of lead in paint in the member state but it has been exporting the lead chromates to other developing nations where the lead limit is still weak to incorporate.
    - The **REACH Regulation** prohibits the manufacture, sale, and use of paints containing hazardous levels of lead.
    - The EU also enforces strict labeling requirements, ensuring that consumers are aware of lead content.
    - All paints must be certified by third-party testing labs before entering the market.
3. **ASEAN Countries**:
    - **Thailand** and **Philippines** have phased out lead in all types of paints, including decorative and industrial paints.
    - Incentives are provided to manufacturers to transition to lead-free formulations.

[10] https://www.epa.gov/lead/lead-renovation-repair-and-painting-program-rules

[11] https://www.epa.gov/lead/lead-based-paint-disclosure-rule-section-1018-title-x

[12] https://www.achhd.org/leadpoisoning/regs.htm#:~:text=If%20you%20participate%20in%20a,://www.cpsc.gov/

[13] https://ipen.org/news/countries-lead-paint-bans-continue-export-key-lead-paint-ingredient-double-standard-puts

[14] https://www.saicm.org/Portals/12/Documents/GEF-Project/Amalty-WS/Kirsi_EU%20Restrictions%20Lead%20in%20paints

- Rigorous monitoring and public awareness campaigns have significantly reduced lead paint usage.

4. **Philippines**: The usage of lead paint is govern by the 'Chemical Control Order (CCO) for lead and Lead Compounds,2013'. The key provisions are discussing hereafter:

- The lead-in paints limit to 90 Ppm for both industrial and decorative paints.
- Most important prospects of this order is that it had been planned to gradual phase out of decorative paint within the three years from its commencement. And in case of industrial paint, 6 years from its commencement.
- It prohibited the lead paint in the following sectors:
    - Toys
    - School supplies
    - Jewelry
    - Food and Drink Container
    - Cosmetics
    - Other items that adjacent to children
- Manufacturers are required to take certification of lead-limit Esurance in the product.
- The Environmental ministry is responsible for all kinds of monitoring, penalty and other purposes to ensure the safe future.

5. **India**: India in 2017, banned the use of lead in decorative or household paint limited to 90 ppm the regulation called, 'Regulation on Lead Contents in Household and Decorative Paint Rules,2016'. According to this rule- All manufacturers, importers, exporters, and retailers shall abide by the above-mentioned limit.

6. **United Kingdom**: To prevent the generation of lead exposure, the 'Lead Paint Protection Against Poisoning,1927[15] has demonstrated the following provisions –

- According to this Act, lead paint means any paint, paste, spray, stopping, filling, or other materials used in painting which, when treated in a manner prescribed by rules made by the ministry, yield to an aqueous solution of hydrochloride acid, a number of soluble lead compounds exceeding when calculated as lead monoxide five percent of the dry weight of the portion.
- Section 1 of the Act states that it is the responsibility of the employers to inspect that the lead paint should not be used or procured for use in the painting of buildings except in the form of raw or dry state. Also, to inspect lead paint shall not be stored at any place otherwise than in receptacles legibly marked as containing lead.
- Section 2 said, lead paint shall not be applied in the form of spray in the interior painting of buildings

[15] https://www.legislation.gov.uk/nisro/1927/129/pdfs/nisro_19270129_en.pdf

- Section 4 entails that every person associated with lead paint dealing must be provided safety equipment.

Bangladesh's limited scope of regulation (decorative paints only) and the lack of effective enforcement mechanisms highlight a significant gap compared to these international best practices.

While Bangladesh has made progress in regulating decorative paints, the lack of comprehensive standards for industrial paints, weak enforcement, and limited public awareness hinder the country's ability to address lead exposure comprehensively. Strengthening the regulatory framework to include industrial paints, enhancing enforcement mechanisms, and aligning with international best practices are critical steps to protect public health and promote sustainable industry practices.

FINDINGS FROM THE GAP ANALYSIS

The findings of this comprehensive gap analysis are derived from Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), Consultation workshops, and an extensive desk review. This research aims to provide a thorough understanding of the gaps in regulatory frameworks, economic barriers, health and safety challenges, consumer awareness, and operational inefficiencies concerning lead in paints in Bangladesh. The findings focus on both decorative and industrial paints and explore how these gaps contribute to health risks, environmental harm, and economic inefficiencies.

1. REGULATORY GAPS

The absence of comprehensive regulations and weak enforcement mechanisms have created significant challenges in controlling lead usage in paints, especially industrial paints.

❖ **Lack of Standards and Regulation for Industrial Paints**:

- Although Bangladesh has established a **90 ppm lead limit for decorative paints**, which aligns with international standards, there are no enforceable regulations for **industrial paints**. Industrial paints, which are widely used in sectors such as **railways, shipbuilding, construction, and heavy machinery**, often contain dangerously high levels of lead due to performance requirements like corrosion resistance and durability.

- Key stakeholders emphasized that the absence of industrial paint standards creates a regulatory vacuum, allowing manufacturers to continue producing high-lead-content industrial paints without facing any consequences.

❖ **Weak Enforcement Mechanisms**:

- The enforcement of the 90 ppm lead limit for decorative paints is inconsistent. Regulatory bodies, such as BSTI and the Ministry of Environment, suffer from resource constraints, inadequate staffing, and insufficient capacity, which hinder their ability to conduct inspections and enforce regulations effectively.

- Smaller manufacturers and informal producers often operate outside the regulatory framework. The lack of penalties and follow-up actions for non-compliance creates a competitive disadvantage for compliant manufacturers.

❖ **Challenges in Monitoring and Oversight**:

- Monitoring lead content in paints remains a significant challenge due to the limited availability of testing facilities and poor inspection processes. Regulatory bodies struggle to conduct periodic and systematic inspections, particularly in rural and peri-urban areas.

- Imported raw materials, including pigments and other additives, often bypass lead testing at customs, allowing non-compliant products to enter the market. This further complicates the ability to monitor lead levels in the final products.

❖ **Complex Environmental Clearance Process**:

- The process of obtaining Environmental Clearance Certificates for manufacturers is complex and time-consuming. Smaller manufacturers often avoid this process, perpetuating informal operations that are unregulated and unsafe.

2. ECONOMIC BARRIERS

Economic constraints have emerged as a significant factor preventing the transition to lead-free paints in Bangladesh. These barriers affect both manufacturers and consumers, reinforcing the dominance of lead-based paints in the market.

❖ **High Cost of Lead-Free Raw Materials**:

- Lead-free pigments, driers, and other additives are significantly more expensive than lead-based alternatives. For instance, the cost of transitioning to lead-free production can increase manufacturing expenses by up to **50-70%**, particularly for smaller producers.

- Import duties and taxes on lead-free raw materials further exacerbate these costs. Many manufacturers report that the high cost of raw materials discourages them from adopting safer alternatives.

❖ **Lack of Financial Incentives**:

- The government has not introduced subsidies, tax reductions, or financial support mechanisms to encourage the production and use of lead-free paints. Smaller manufacturers, who already operate on thin margins, find it economically unviable to transition to lead-free production without external support.

- Formal manufacturers face unfair competition from informal producers, who evade regulations and produce cheaper lead-based paints and vice-versa, further discouraging compliance.

❖ **Market Dynamics**:

- Lead-based paints dominate the market due to their **lower cost, bright color, and durability**. Consumers, particularly in rural areas, prioritize affordability over health concerns, perpetuating demand for lead-based products.

- Many stakeholders pointed out that consumer behavior plays a critical role in shaping market trends, as low awareness about the health risks of lead-based paints discourages demand for lead-free alternatives.

3. CONSUMER AND STAKEHOLDER AWARENESS

A significant gap in awareness among manufacturers, workers, and consumers perpetuates unsafe practices and hinders efforts to transition to safer alternatives.

❖ **Low Awareness Among Manufacturers and Consumers**:

- Many small and medium-sized manufacturers are unaware of existing lead regulations and the health risks associated with lead exposure. This lack of awareness leads to the continued use of lead-based raw materials in their production processes.
- Consumers, especially those in rural and peri-urban areas, lack information about the dangers of lead in paints and the availability of lead-free alternatives. This knowledge gap drives demand for cheaper, lead-containing paints, further discouraging manufacturers from transitioning to safer products.

❖ **Limited Worker Knowledge**:

- Workers in paint manufacturing facilities often lack basic training in occupational health and safety (OHS). Many are unaware of the risks associated with handling lead-based materials, leading to unsafe practices such as improper disposal and inadequate use of protective equipment.
- Factory inspections revealed that most workers do not wear gloves, masks, or other protective gear, increasing their vulnerability to long-term health issues such as lead poisoning.

4. HEALTH AND SAFETY CHALLENGES

The absence of proper health and safety measures in the paint industry poses significant risks to workers and surrounding communities.

❖ **Lack of Protective Equipment**:

- Workers often avoid wearing protective equipment due to discomfort, lack of availability, and insufficient training. As a result, they are frequently exposed to lead dust and fumes, leading to serious health issues such as respiratory problems, neurological damage, and chronic lead poisoning.

❖ **Environmental Hazards**:

- Improper disposal of lead-based paint waste is a common practice, resulting in the contamination of soil, water, and air. Communities living near manufacturing or disposal sites face increased risks of respiratory illnesses, developmental delays in children, and other health concerns

❖ **Absence of Health Monitoring**:

- Workers exposed to lead-based materials do not receive regular health check-ups. There are no established mechanisms to monitor the long-term health impacts of lead exposure, leaving workers and their families vulnerable to undiagnosed health conditions.

5. INFRASTRUCTURE DEFICIENCIES

The lack of adequate infrastructure is a critical barrier to addressing lead contamination in paints, especially for monitoring and compliance purposes. Infrastructure deficiencies in Bangladesh exacerbate regulatory challenges, limit enforcement capacity, and hinder the transition to lead-free practices.

❖ **Limited Testing Facilities**:

- Bangladesh has a severe shortage of accredited **testing laboratories** capable of analyzing lead content in paints and raw materials. Existing facilities are primarily located in major urban centers, making them inaccessible to many manufacturers in rural and peri-urban areas.

- Informal and small-scale manufacturers often lack access to affordable and reliable testing services, which prevents them from verifying compliance with the 90 ppm limit or transitioning to lead-free alternatives.

❖ **Lack of Mobile Testing Units**:

- The absence of portable testing kits (like XRF machines) or mobile units prevents regulatory authorities from conducting on-site inspections efficiently. This limits the ability to monitor paint production facilities, particularly in remote regions.

❖ **Inadequate Waste Management Infrastructure**:

- Many manufacturers, especially in the informal sector, lack proper facilities for the safe disposal of hazardous waste, including lead-based materials. This contributes to environmental contamination and poses significant health risks to surrounding communities

- Recycling facilities for lead-containing by-products are either non-existent or insufficiently equipped, leaving large quantities of hazardous waste improperly managed.

❖ **Insufficient Capacity for Regulatory Oversight**:

- Regulatory bodies such as BSTI and the Ministry of Environment have limited resources, including funding, staffing, and technological capabilities, to conduct regular inspections or enforce compliance effectively

- The lack of modern tools, equipment, and training for inspectors further reduces the capacity to identify and address violations

❖ **Absence of Research and Development (R&D) Facilities**:

- There is a notable lack of investment in R&D infrastructure to develop affordable, lead-free alternatives that meet the performance requirements of both decorative and industrial paints. Manufacturers rely heavily on imported technologies, which increases costs and delays the transition to safer production practices

❖ **Gaps in Import Inspection Infrastructure**:

- Customs facilities lack adequate testing mechanisms to verify the lead content of imported raw materials and finished paints. This allows non-compliant, high-lead-content products to enter the domestic market

❖ **Regional Disparities in Monitoring**:

- Infrastructure for monitoring compliance is heavily concentrated in urban areas, leaving rural and small-scale production units largely unregulated. This regional disparity creates significant enforcement gaps and enables non-compliance in less-monitored areas

The infrastructure deficiencies in Bangladesh's paint industry pose significant challenges to effective regulation, monitoring, and compliance with lead standards.

TECHNICAL ASSESSMENT AND DISCUSSION

Based on comprehensive data from desk reviews, KIIs, and workshops, the technical assessment reveals deep-rooted deficiencies in infrastructure, operational mechanisms, and regulatory capacity to address the issue of lead in paints in Bangladesh. This discussion highlights key areas of concern supported by illustrative data and actionable recommendations.

1. TESTING FACILITIES

Current Status: Only 30% of the required testing facilities for monitoring lead content in paints are operational. Most of these facilities are concentrated in urban areas, making it challenging for rural and peri-urban manufacturers to access them.

Challenges:

- Testing facilities are underfunded, lack modern equipment, and operate with limited human resources.
- Smaller manufacturers and informal sectors rarely test their products due to the high costs and lack of accessible labs.

Recommendations:

- Establish additional regional testing centers and mobile testing units.
- Provide subsidies for testing fees to encourage compliance from smaller manufacturers.

2. MOBILE TESTING UNITS

Current Status: Mobile testing infrastructure is nearly non-existent, with only 20% of the required capacity available.

Challenges:

- Regulatory authorities cannot monitor remote or informal production units due to logistical limitations.
- This gap allows non-compliant manufacturers to evade oversight, particularly in rural areas.

Recommendations:

- Invest in portable lead-testing kits and mobile units for on-site inspections.
- Train inspectors to conduct field tests efficiently.

3. WASTE MANAGEMENT SYSTEMS

Current Status: Only 25% of the required waste management infrastructure is functional, leading to widespread environmental contamination.

Challenges:

- Hazardous waste from lead-based paint production is often dumped in open areas, contaminating soil and water.
- Informal manufacturers lack the resources and knowledge to implement safe disposal practices.

Recommendations:

- Develop centralized hazardous waste collection points.
- Enforce strict penalties for improper waste disposal.

4. REGULATORY AND ENFORCEMENT CAPACITY

Current Status: Regulatory enforcement operates at only 40% of its potential, with frequent lapses in compliance checks and inspections.

Challenges:

- Resource constraints, including inadequate staffing and outdated equipment, hinder effective enforcement.
- Corruption and lack of accountability further weaken regulatory mechanisms.

Recommendations:

- Increase funding and staffing for regulatory bodies like BSTI.
- Deploy digital tools for tracking compliance in real-time.

5. RESEARCH AND DEVELOPMENT (R&D) FACILITIES

Current Status: Only 15% of the required R&D capacity exists, delaying the development of affordable and effective lead-free alternatives.

Challenges:

- Manufacturers rely heavily on imported technologies, which are expensive and not tailored to local needs.
- There is minimal collaboration between industry and academic institutions for innovation.

Recommendations:

- Provide grants to academic institutions for R&D in lead-free technologies.
- Encourage public-private partnerships to innovate cost-effective alternatives.

6. IMPORT INSPECTION INFRASTRUCTURE

Current Status: Customs and import inspection systems are functioning at only 10% capacity.

Challenges:

- Imported raw materials and finished products often bypass lead content testing, flooding the market with non-compliant items.
- Regulatory loopholes at customs checkpoints exacerbate the issue.

Recommendations:

- Set up specialized inspection units at major ports.
- Integrate digital tools to streamline import testing processes.

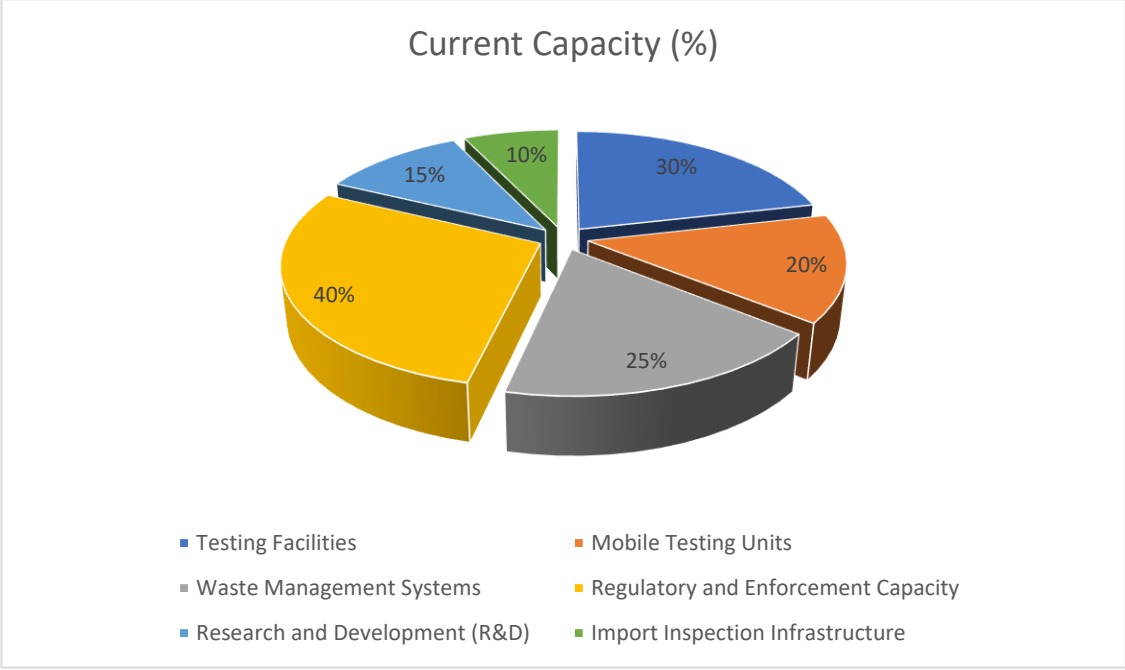


Figure 4: Current capacity gaps in key infrastructure for testing, enforcement, waste management, and R&D.

RECOMMENDATIONS

Based on the findings from the desk reviews, Key Informant Interviews (KIIs), workshops, and Focus Group Discussions (FGDs), the following comprehensive recommendations are proposed to address the challenges related to lead in paints and infrastructure deficiencies in Bangladesh. These recommendations focus on regulatory reforms, capacity building, infrastructure development, and stakeholder engagement to ensure a safer and lead-free paint industry.

1. POLICY AND REGULATORY REFORMS

Strengthening the regulatory framework is crucial to ensure compliance with lead standards and to address the gaps in industrial and decorative paint regulations.

- **Establish Standards for Industrial Paints**:
  - Introduce a **90 ppm lead limit** for industrial paints, similar to the existing standard for decorative paints.
  - Develop sector-specific guidelines for industries that heavily use industrial paints, such as shipbuilding, railways, and construction.
- **Amend Existing Regulations**:
  - Update the **BSTI standards** to include mandatory compliance mechanisms for both local and imported paints.
  - Require manufacturers to obtain compliance certification for all product categories.
- **Strengthen Enforcement Mechanisms**:
  - Increase funding and staffing for regulatory bodies like BSTI and the Ministry of Environment to improve inspection capacity.
  - Introduce stricter penalties for non-compliance, including fines, product recalls, and operational suspensions.
- **Simplify the Environmental Clearance Process**:
  - Streamline the process for obtaining Environmental Clearance Certificates, especially for small and medium-sized enterprises (SMEs).
  - Develop an online portal for tracking and processing applications to reduce bureaucratic delays.

2. INFRASTRUCTURE DEVELOPMENT

Improving infrastructure is critical for monitoring compliance, enhancing operational capacity, and addressing environmental and health risks.

- **Expand Testing Facilities**:
  - Establish **regional testing laboratories** to ensure accessible and affordable testing for manufacturers across the country.
  - Invest in **state-of-the-art equipment** for lead content analysis in both raw materials and finished products.
- **Introduce Mobile Testing Units**:
  - Deploy **portable testing kits** and mobile units to conduct on-site inspections, particularly in remote and informal production areas.
- **Develop Waste Management Systems**:

- Set up centralized hazardous waste collection points and establish guidelines for the safe disposal of lead-containing materials.
- Encourage manufacturers to adopt waste recycling practices by providing financial incentives.

❖ **Strengthen Import Inspection Infrastructure**:
- Equip customs facilities with modern lead testing tools to verify the compliance of imported raw materials and finished products.
- Train customs officials to identify and handle non-compliant imports effectively.

❖ **Invest in Research and Development (R&D)**:
- Establish **R&D facilities** in collaboration with academic institutions to develop cost-effective and durable lead-free alternatives.
- Provide grants and subsidies to encourage innovation in the paint sector.

3. ECONOMIC INTERVENTIONS

Economic incentives and financial support are essential to encourage manufacturers to transition to lead-free production.

❖ **Reduce Import Duties and Taxes**:
- Lower tariffs on lead-free raw materials to make them more affordable for manufacturers.
- Remove VAT on equipment and technologies required for lead-free production.

❖ **Introduce Subsidies for Lead-Free Production**:
- Provide subsidies to manufacturers transitioning to lead-free alternatives to offset the initial investment costs.
- Offer low-interest loans or grants for SMEs to upgrade their facilities.

❖ **Encourage Public-Private Partnerships**:
- Collaborate with the private sector to fund infrastructure projects, such as waste management systems and testing facilities.
- Develop joint ventures for producing and marketing lead-free paints.

4. AWARENESS AND CAPACITY BUILDING

Raising awareness among manufacturers, workers, and consumers is vital for driving demand for lead-free paints and ensuring safe practices.

❖ **Consumer Awareness Campaigns**:
- Launch nationwide campaigns to educate consumers about the dangers of lead in paints and the benefits of lead-free alternatives.
- Use social media, traditional media, and community outreach programs to target both urban and rural populations.

❖ **Worker Training Programs**:
- Provide training on **Occupational Health and Safety (OHS)** standards to workers in paint manufacturing facilities.
- Ensure that all workers have access to and are trained in using Personal Protective Equipment (PPE).

❖ **Stakeholder Engagement**:

- Conduct regular workshops and consultation meetings with industry stakeholders, including manufacturers, regulatory bodies, and NGOs.
- Foster dialogue between informal and formal sectors to address challenges in transitioning to compliance.

❖ **Incorporate Lead Safety in School Curricula**:
- Introduce educational modules on the health and environmental risks of lead exposure in schools and colleges.
- Encourage student-led initiatives to promote awareness about lead-free products.

5. MONITORING AND COMPLIANCE

Ensuring compliance with lead standards requires robust monitoring mechanisms and the use of technology for efficient oversight.

❖ **Digitize Monitoring Processes**:
- Develop an online database to track manufacturer compliance with lead standards.
- Use AI-powered tools to analyze trends and identify non-compliant manufacturers.

❖ **Conduct Periodic Inspections**:
- Schedule regular inspections of manufacturing facilities, with a focus on high-risk sectors like informal producers and industrial paint manufacturers.
- Include community representatives in monitoring activities to ensure transparency.

❖ **Set Up an Independent Oversight Body**:
- Establish an independent agency to oversee compliance with lead regulations, separate from BSTI and other existing bodies.
- Provide this agency with legal authority to enforce penalties and take corrective actions.
- Facilitate intergovernmental coordination among relevant ministries, agencies, and local authorities to ensure a unified and efficient approach to enforcing lead regulations.

❖ **Publish Compliance Reports**:
- Release annual compliance reports to highlight progress and identify areas for improvement.
- Reward compliant manufacturers with recognition or incentives to encourage best practices.

6. INTERNATIONAL COLLABORATION

Learning from international best practices can accelerate the adoption of lead-free standards and improve regulatory frameworks.

❖ **Adopt Global Best Practices**:
- Benchmark regulations against successful models from the EU, USA, and ASEAN countries.
- Integrate international standards, such as ISO, into local compliance requirements.
- Establish a National Advisory Committee with active participation from the Department of Environment (DoE) and other relevant stakeholders, ensuring that any department does not create unnecessary delays or halt processes.

❖ **Participate in International Forums**:

- Engage with global initiatives on lead safety, such as the Global Alliance to Eliminate Lead Paint.
- Share knowledge and collaborate on R&D with international partners.

❖ **Leverage Foreign Aid and Grants**:

- Seek funding from international organizations, such as UNICEF and the World Bank, for infrastructure and awareness programs.

WAY FORWARD

Addressing these challenges requires a coordinated, multi-sectoral approach involving key stakeholders such as government ministries, regulatory bodies, industries, and civil society. The Action Plan for Addressing Lead in Paints provides a structured framework to bridge the existing gaps in policy, infrastructure, and operational practices. It outlines a roadmap to establish industrial paint standards, expand testing facilities, strengthen enforcement mechanisms, introduce economic incentives, and promote awareness campaigns to drive the transition towards a lead-free paint industry.

1. ACTION PLAN FOR ADDRESSING LEAD IN PAINT

Step	Description	Timeline	Responsible Ministry/Authority
1. Establish Standards for Industrial Paints	- Develop and enforce a 90 ppm lead limit for industrial paints. - Update BSTI regulations.	By 2025	- Ministry of Industries - BSTI (Bangladesh Standards and Testing Institution)
2. Expand Testing Facilities and Mobile Units	- Establish regional testing laboratories with modern equipment. - Deploy mobile testing units.	By 2026	- Ministry of Industries - Ministry of Science and Technology - Ministry of Environment, Forest and Climate Change -Atomic Energy Research Comission
3. Strengthen Enforcement Mechanisms	- Increase resources for regulatory bodies. - Introduce stricter penalties for non-compliance.	By 2026	- Ministry of Environment, Forest and Climate Change - BSTI
4. Introduce Economic Incentives	- Reduce import duties on lead-free raw materials. - Provide subsidies and financial support.	By 2026	- Ministry of Finance - National Board of Revenue (NBR)
5. Establish Blood Lead Level Testing Facilities and Lead Treatment Centers	-Develop nationwide blood lead level (BLL) testing facilities to monitor lead exposure in vulnerable populations.	By 2026	- Ministry of Health and Family Welfare

	-Establish specialized treatment centers for lead poisoning and provide training for healthcare professionals to handle lead-related cases.		
6. Raise Consumer and Worker Awareness	- Launch national awareness campaigns. - Conduct training programs for workers.	By 2027	- Ministry of Information and Broadcasting - Ministry of Labour and Employment - Ministry of Environment, Forest and Climate Change - Ministry of Education
7. Develop R&D Infrastructure	- Establish R&D facilities for lead-free alternatives. - Collaborate with academic institutions.	By 2028	- Ministry of Science and Technology - Ministry of Education - Ministry of Health and Family Welfare
8. Implement Waste Management Systems	- Establish centralized hazardous waste collection points. - Introduce safe disposal guidelines.	By 2029	- Ministry of Environment, Forest and Climate Change - Local Government Division (LGD)
9. Achieve Full Compliance Across Sectors	- Ensure compliance by informal and formal manufacturers. - Publish annual compliance reports.	By 2030	- Ministry of Industries - Ministry of Environment, Forest and Climate Change - BSTI

2. ROLE AND RESPONSIBILITIES OF MINISTRIES

To address this multifaceted problem, a collaborative approach involving multiple government ministries and regulatory bodies is essential. Each ministry plays a critical role in implementing and enforcing policies, building infrastructure, raising awareness, and ensuring compliance. From the Ministry of Industries leading the development of paint standards to the Ministry of Environment overseeing waste management, and from the National Board of Revenue reforming tax structures to the Ministry of Education promoting lead safety awareness in curricula, this framework aims to integrate efforts across all relevant sectors.

1. **Ministry of Industries**:

- Lead the development and enforcement of paint standards.
- Oversee the implementation of testing facilities.

2. **Bangladesh Standards and Testing Institution (BSTI)**:

- Monitor compliance with paint standards.
- Conduct inspections and testing for lead content.

3. **Ministry of Environment, Forest and Climate Change**:

- Ensure environmental compliance, particularly in waste management and hazardous materials disposal.
- Collaborate with other ministries to strengthen enforcement.

4. **Ministry of Finance**:

- Allocate funds and introduce tax reforms to support lead-free initiatives.
- Provide financial support for infrastructure development.

5. **National Board of Revenue (NBR)**:

- Adjust import duties and taxes to incentivize the use of lead-free materials.

6. **Ministry of Information and Broadcasting**:

- Conduct awareness campaigns targeting consumers and industries.

7. **Ministry of Science and Technology**:

- Establish and fund R&D initiatives for safer paint alternatives.

8. **Ministry of Labour and Employment**:

- Train workers on occupational health and safety practices.

9. **Local Government Division (LGD)**:

- Manage waste collection and disposal systems at the local level.

10. **Ministry of Education**:

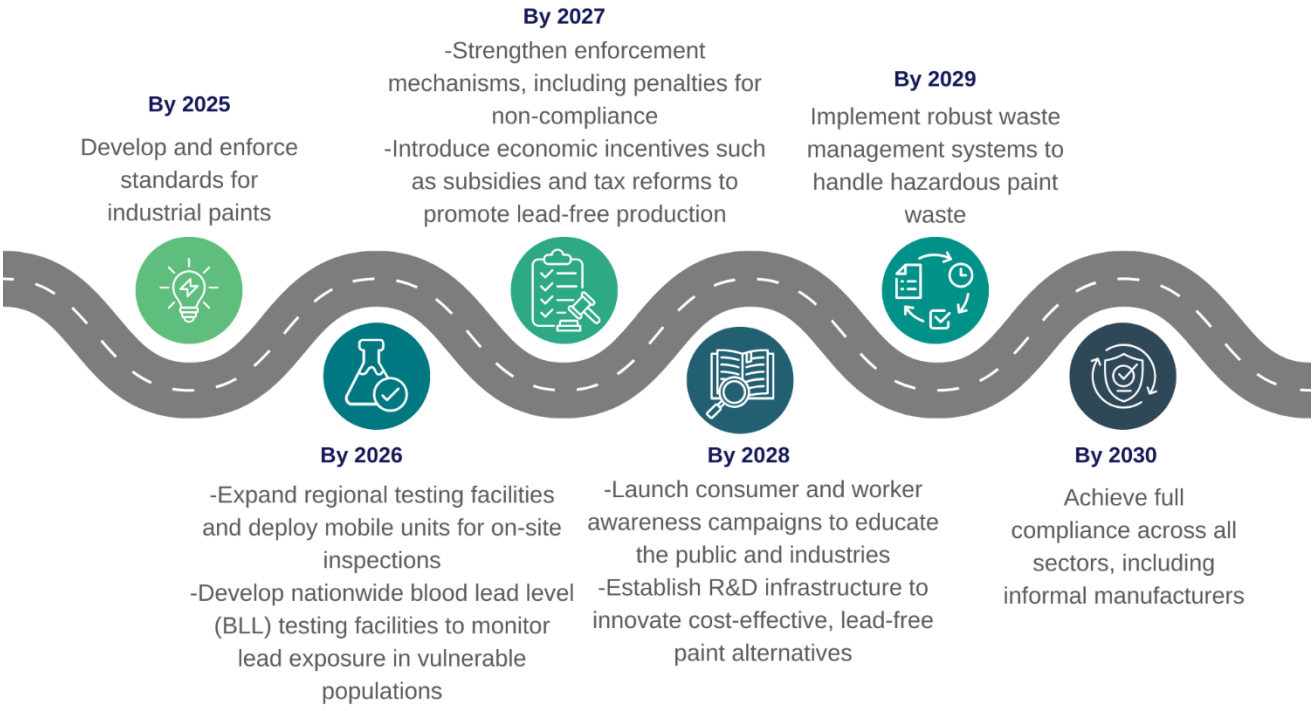
- Collaborate with R&D efforts and incorporate lead safety into educational curricula.

11. **Ministry of Health and Family Welfare**

- Collaborate with public and private healthcare institutions for widespread testing and treatment availability.
- Launch public health campaigns to raise awareness of lead poisoning symptoms and available treatment facilities.

3. DRAFT ROADMAP FOR ADDRESSING LEAD IN PAINTS (2025-2030)

The roadmap consists of the following sequential milestones:



CONCLUSION

The presence of lead in paints continues to pose a significant health, environmental, and economic challenge in Bangladesh. Despite growing awareness and the implementation of a 90 ppm lead limit for decorative paints, the regulatory framework remains inadequate, particularly for industrial paints. The absence of enforceable standards, weak enforcement mechanisms, insufficient infrastructure, and low levels of awareness among stakeholders perpetuate the use of hazardous lead-based products. This gap allows informal and unregulated practices to dominate parts of the industry, jeopardizing public health, worker safety, and environmental integrity.

The findings in this report underscore the urgent need to address these gaps comprehensively. Lead exposure has devastating consequences, particularly for children, who suffer irreversible developmental and cognitive impairments, and for workers in the paint manufacturing and recycling industries, who face prolonged exposure to hazardous materials without adequate protection. Furthermore, improper disposal of lead-contaminated waste has severe repercussions for the environment, contaminating soil, water, and air, and threatening agricultural productivity and biodiversity. These risks highlight the pressing need for a multi-pronged, collaborative approach to eliminating lead contamination from paints.

The report also emphasizes the economic and structural barriers that hinder progress. The high cost of transitioning to lead-free alternatives, combined with the lack of financial incentives and subsidies, deters manufacturers—especially small and medium enterprises—from adopting safer practices. Limited testing facilities, absence of mobile testing units, inadequate waste management systems, and insufficient R&D investments further exacerbate the problem. These infrastructural deficiencies, coupled with weak customs oversight, allow non-compliant products and raw materials to flood the market unchecked.

Despite these challenges, this report outlines a detailed roadmap for eliminating lead in paints by 2030. The recommendations focus on strengthening regulatory frameworks, expanding infrastructure, incentivizing safer production practices, raising awareness among stakeholders, and fostering international collaboration.

The elimination of lead from paints is not just a regulatory goal but a moral imperative to protect the health and well-being of future generations. The costs of inaction are staggering, both in terms of human suffering and environmental degradation. Conversely, the benefits of a lead-free paint industry extend beyond public health to include enhanced environmental sustainability, improved worker safety, and a globally competitive industrial sector.

The road ahead demands bold and decisive action. It requires strong political will, robust policy-making, and active engagement from all sectors of society. Implementing the recommendations outlined in this report will require a concerted effort, but the rewards are immense. By 2030, Bangladesh has the potential to transform its paint industry into a model of safety, sustainability, and global competitiveness, ensuring a healthier, cleaner, and more prosperous future for its people.

The time to act is now. Let this report serve as a blueprint for change, a catalyst for reform, and a testament to Bangladesh's commitment to protecting its people and environment. Together, we can eliminate lead from paints and pave the way for a safer and more sustainable tomorrow.

Bright Future Begins Lead-free

Environment and Social Development Organization

Address: 8/1 Block C Lamatia Dhaka

Email: info@esdo.org

Website: www,esdo.org