

**Final Workshop of the Project  
Minamata Initial Assessment**

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# **THE MIA BANGLADESH: FINDINGS, CHALLENGES AND NEXT STEPS**

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# Country Profile



- Area 147,570 square kilometers
- 8th most populous country in the world with 158.9 million inhabitants.
- an annual GDP growth of 7.284% largely driven by its exports of ready-made garments (80% of total exports)
- Natural gas is the main energy source of Bangladesh for power generation
- does not manufacture consumer products (except light, paint and cosmetic products) but relies on imports from other countries



# Sectors contributing to Mercury Emissions

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- **No mercury /gold mining in Bangladesh.** Source of mercury mostly from imports (legal import 3.73MT according to NBR).
- **Coal use:**
  - Barapukuriya power plant: 4,500 tons coal combusted per day
  - Bangladesh is producing about 23 billion bricks annually in approximately 7,000 brick kilns (consumption of coal would be 3,942,200 ton per year)
- Natural gas and LNG: 29,660,963,040 Nm<sup>3</sup>/y
- Crude oil refining is 1,400,000 MT/ y



# Sectors contributing to Mercury Emissions

- **Clinker produced in 2 cement factories (1,500,000 t/y)**
- **most of the paper factories import pulp to locally produce paper (94000MT pulp used per year)**
- there are several chlor-alkali production plants, but none of those use mercury cells in the production process
- major demand of light source in Bangladesh is met by florescent tubes and compact fluorescent lamps

Type and average size of unit	Number
Incandescent (60W)	15.1 million
Fluorescent T8 (60W)	14 million
Fluorescent T5(40W)	3.5 million
CFL (15W)	36.6 million
LED (7W)	1.18 million

Source: World Bank



# Sectors contributing to Mercury Emissions

- Total production of paint in Bangladesh =  $125 \times 10^6$  kg/y.  
90% of the cheaper paint types may contain mercury 30 to 60 ppm
- total national production of skin cream is around 25 lac piece/month

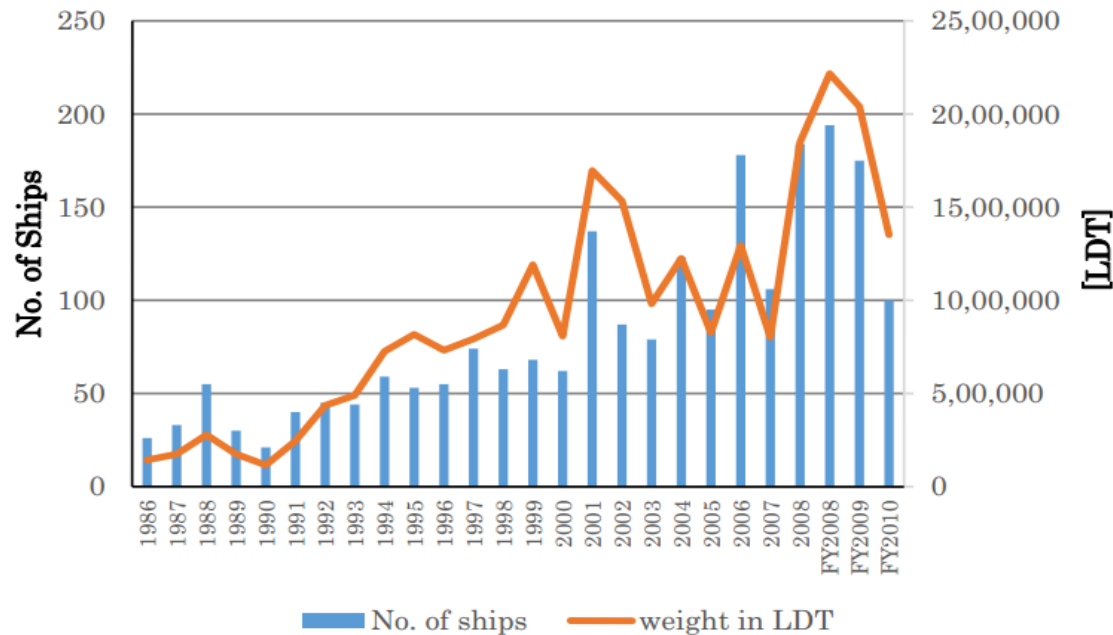
Name of product	Hg concentration (ppm)
Garnier	4653
Fair and Lovely Ayurvedic	4004
Fair and Lovely Max Fairness	4174
Modern	4152
Fair and Handsome	4133
Botanic	3929
Tibbat	3752
PONDS	3450
OLAY	3603
Sumon's Aroma	3361

Source: ESDO (2015) study



# Sectors contributing to Mercury Emissions

- much of the recycled ferrous metal comes from dismantling of old ships



Estimated LDT and number of ships imported

- Incineration of municipal waste is not practiced in Bangladesh. After collection, municipal waste is partly transported to the landfills, rest are burnt openly



# Poor waste management activities

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waste generation rate nearly 22million tons year<sup>-1</sup> of which, only 20% of waste is under collection coverage

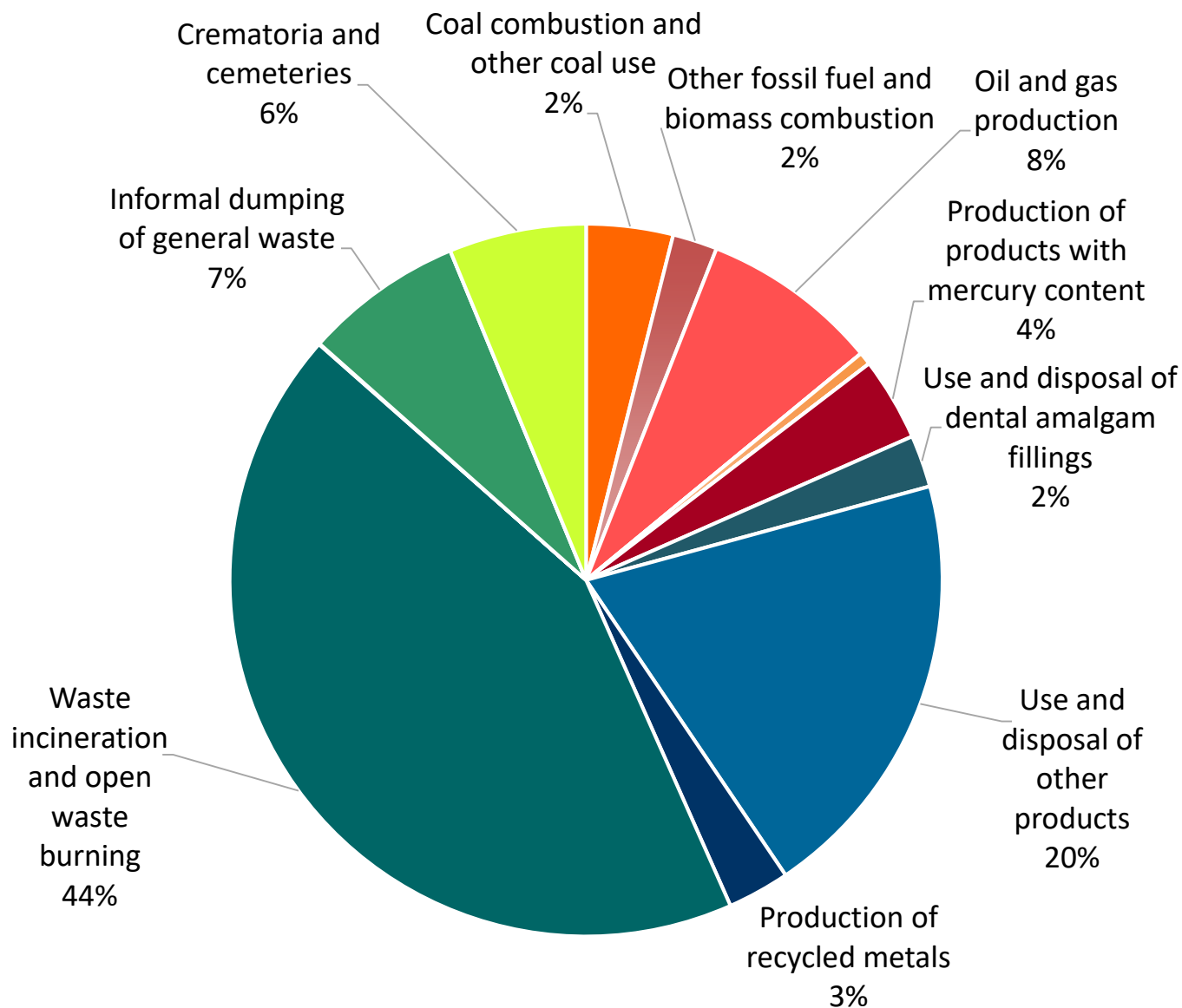


very limited electronic waste recycling and medical waste management facilities

**Mercury-containing wastes** (such as batteries , CFL bulbs, broken thermometers, disused sphygmanometers) will find its way to municipal dumpsites.

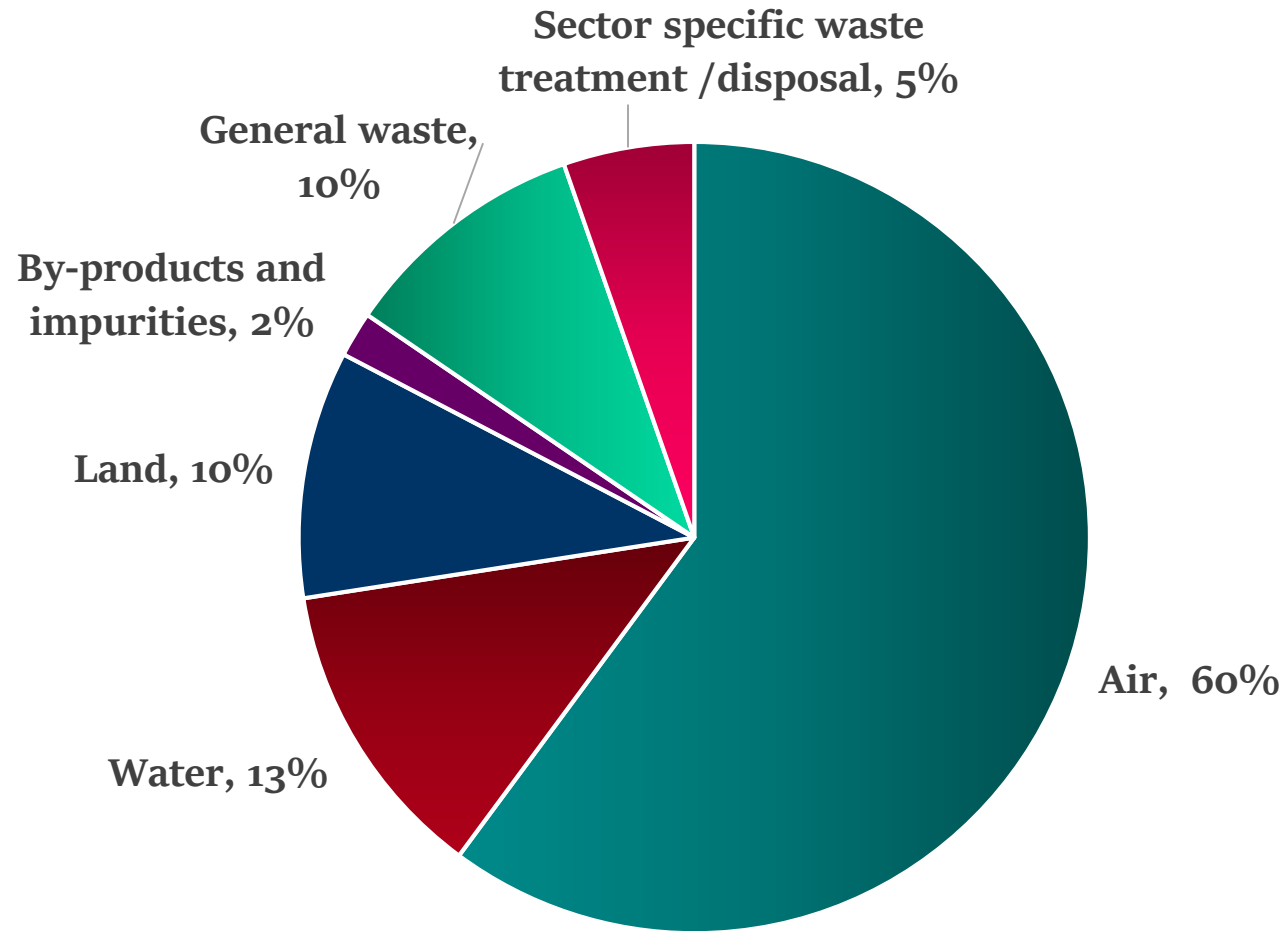


# Estimated total Hg release to society: **32,660 kg Hg/y**

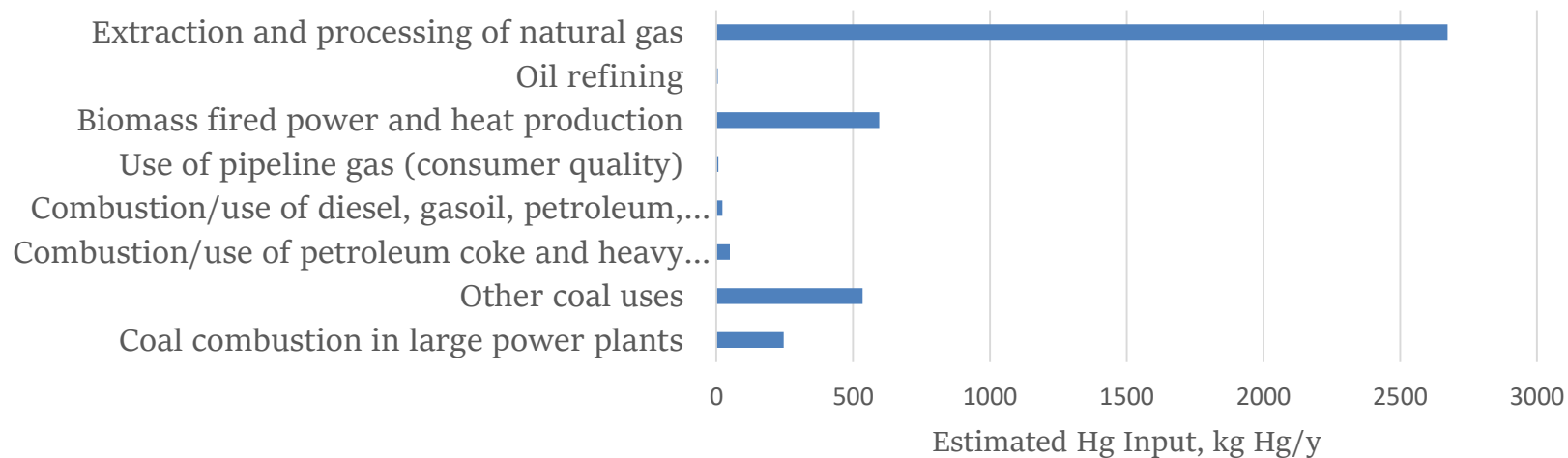




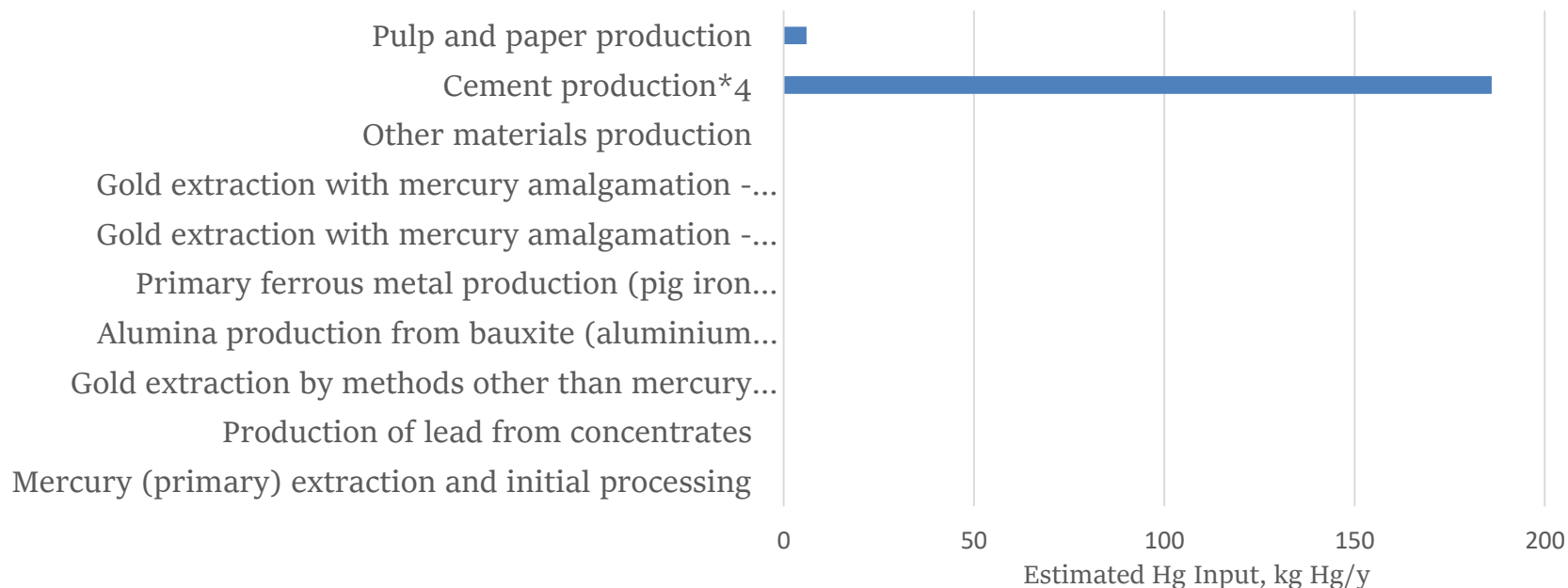
# Mercury Release Pathways



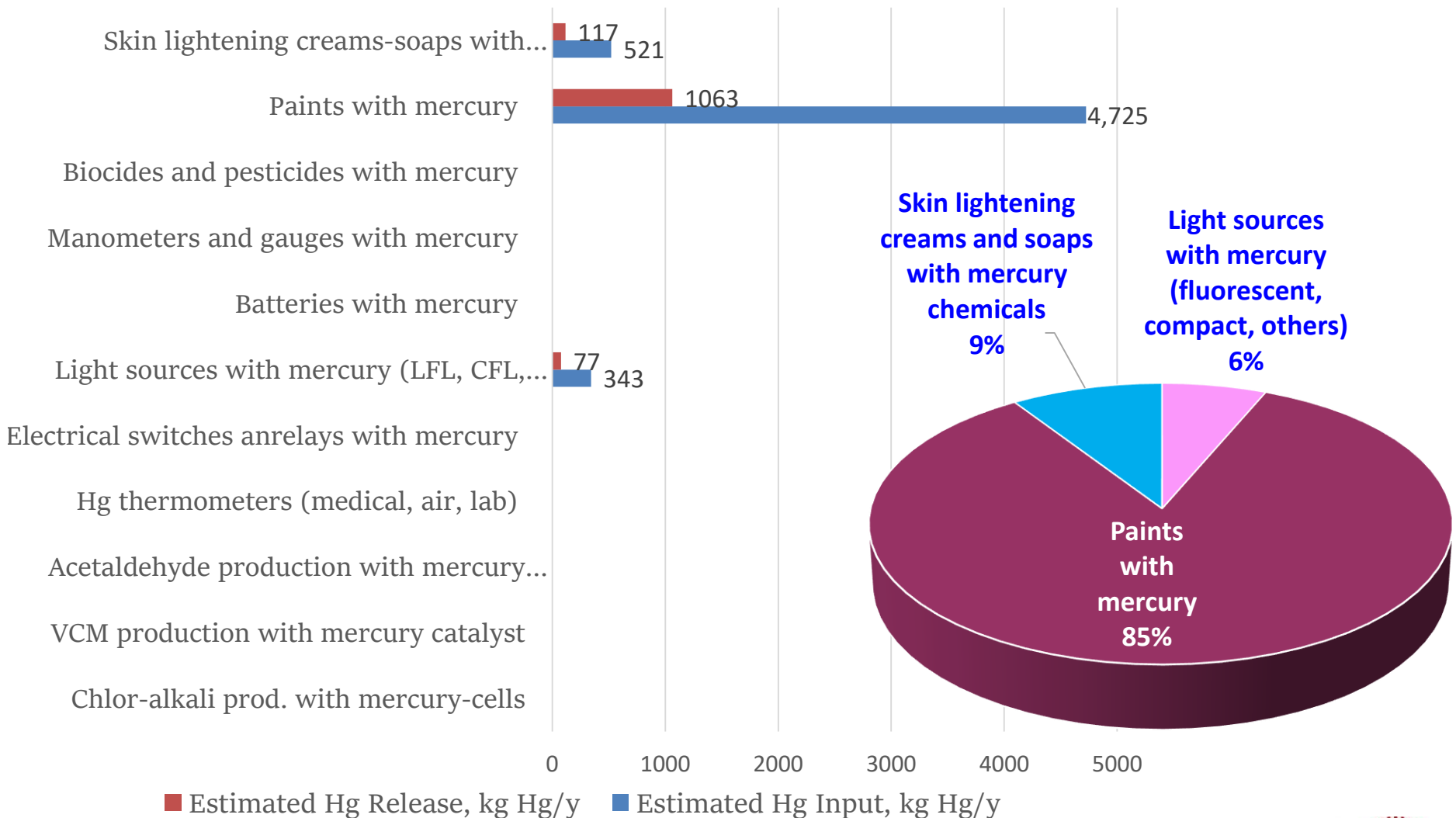
## Energy Consumption (**4,133** kg Hg/y)



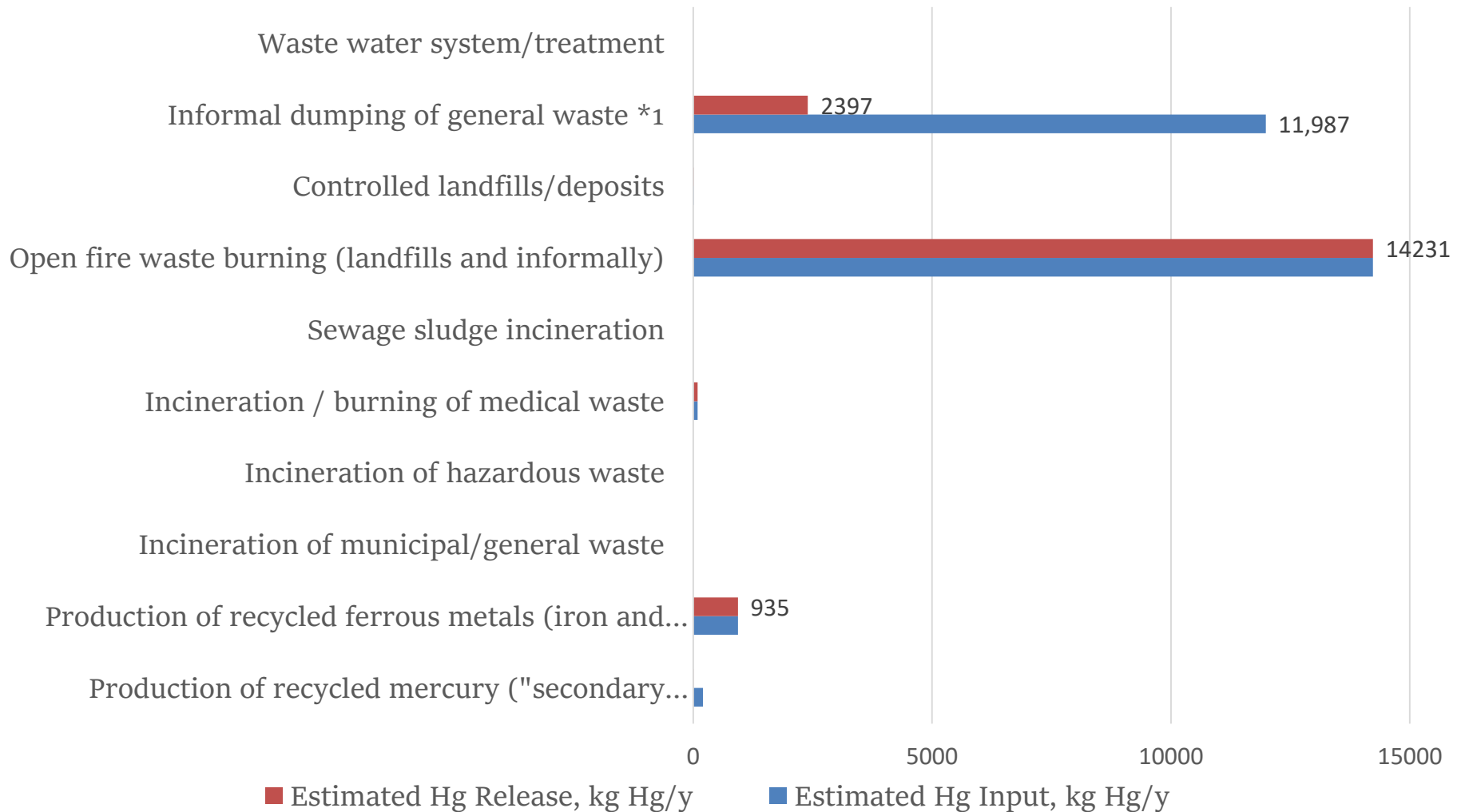
## Domestic Production of Metals and Raw Metals (**192** kg Hg/y)



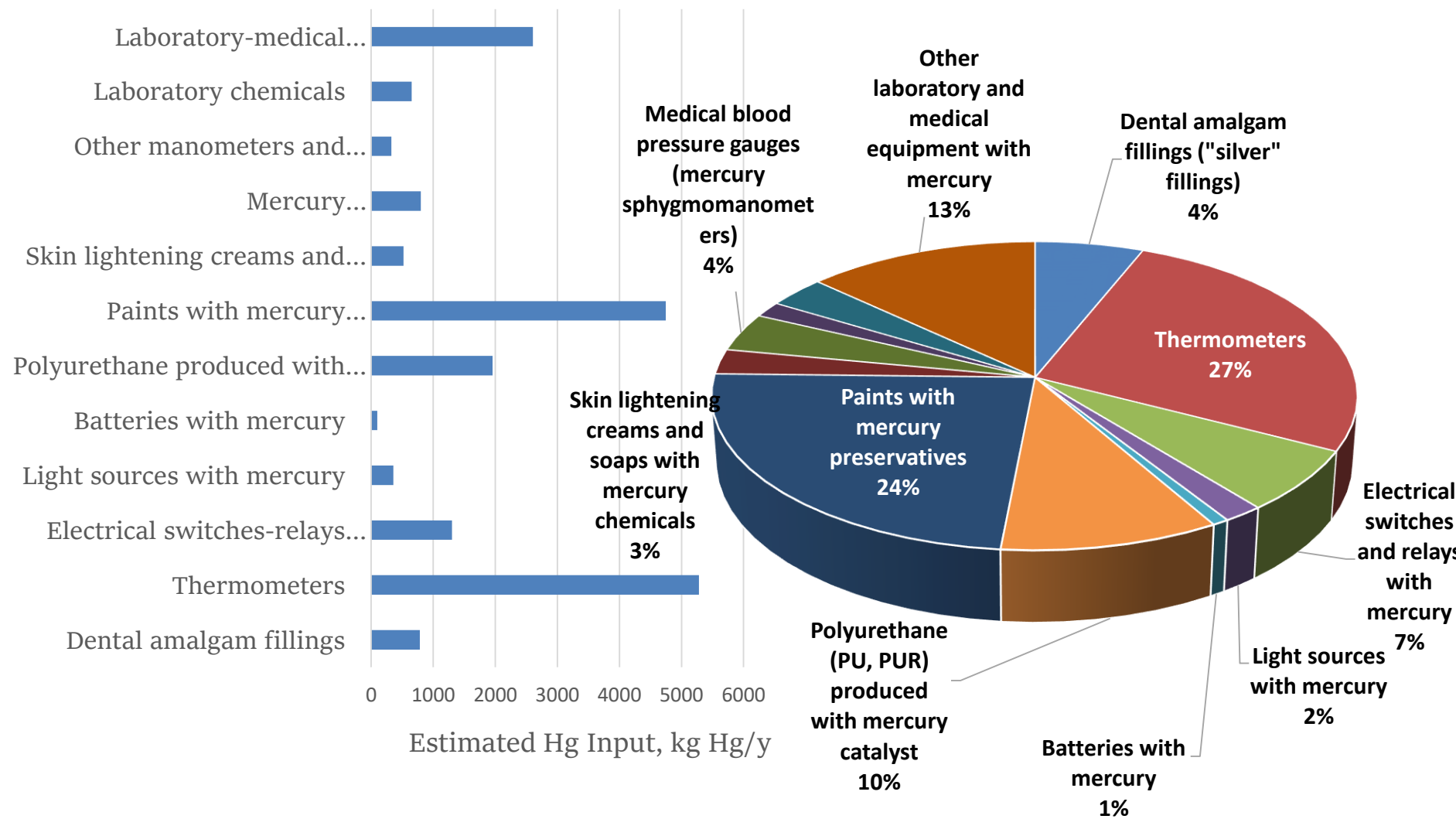
# Industrial Mercury Use (Input: **5,589** kg Hg/y, Release: **1,258** kg Hg/y)



# Waste Treatment and Recycling (Input: **27,457** kg Hg/y, Release: **17,667** kg Hg/y)



# Use and Disposal of Mercury Product Substances (**19,434** kg Hg/y)



# Who are the populations at risk?

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Bangladesh remains vulnerable to mercury contamination from

- uncontrolled dumping of mercury along with medical, industrial, electronic wastes into the waters and soil,
- uncontrolled coal burning in brick kilns,
- fish-dependent protein diet of the population,
- through the use of mercury-added products
- medical applications of mercury (dental amalgam).



# Populations at risk from waste management

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recycling of municipal wastes is being carried out by **informal sectors such as the rag-pickers**. The rag-pickers are less likely to be wearing any sort of personal protective equipment



Unauthorised persons collecting waste from the wards  
(pilferers)



# Population at risk from Dental Amalgam



Approx. **1173 kg mercury is used currently per year** for preparation of fillings at dentist clinics.

Precautionary measures are not always present (use of PPE, mixing done near patients, accidental spills, leaky capsules, vaporization of mercury)

Professional dentists, students, health workers and patients are exposed.





# Population at risk from Fish-dependent Diet

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Concentration of Mercury in inland freshwater fish in Bangladesh has been found to be very low (2 to 430 ng Hg /g fresh weight of the fish)

Marine fisheries are 16.28% of the national fish production. It is estimated that about 88,593 tonnes of fish are imported which is just 1.6% of the total current fish demand of Bangladesh.

Bangladesh Food Safety Authority (BSFA), has recently become increasingly concerned about **heavy metal contamination in imported fishes**

Published quantitative evidence on the presence of mercury in imported and marine fishes are unavailable.



# Population at risk from Mercury-added products



**521 kg of mercury is used in skin creams per year in Bangladesh**

widespread and growing popularity of face whitening products owing to a strong cultural preference for fairer skin. **Females from lower to middle class were more likely to engage in skin bleaching**

**Level of awareness very low**



# Population at risk in Urban Areas

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Most of the brick kilns are clustered around major urban centers such as Dhaka city

The open burning of municipal solid waste takes place in and around major urban centers where population density is high.



# Challenges and limitations

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- Lack of awareness regarding the ill-effects of mercury among general people (both supply and demand-side)
- Lack of institutional capacity
  - Lack of implementation of existing laws and rules (e.g. Hazardous Waste and shipbreaking Rules)
  - Lack of technical knowledge in our scientific institutions regarding mercury
  - Lack of instrumentation, equipment to detect mercury in our technical/scientific institutions
- Lack of waste management facilities (E-waste, medical waste, municipal solid waste)
- Problems in phasing out mercury use in dentistry and light production



# Policy legal Framework and Institutions

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## Regulatory Framework

- *Bangladesh Environment Conservation Act 1995*
- *Environmental Conservation Rules 1997*
- *Hazardous Waste and Ship-breaking Waste Mgt Rules, 2011*
- *Bangladesh Labor Act, 2006*
- *Bangladesh Export Policy, 2015-2018 and Import Policy Order, 2015-2018*
- *The Bangladesh Standards and Testing Institution Ordinance, 1985*
- *Right to Information Act 2009*

## Non-regulatory Framework

- *National Environmental Policy 2013*
- *National 3R Strategy for Waste Management 2009*
- *Bangladesh Standards and Guidelines for Sludge Management 2015*
- *National Health Policy 2011*
- *National Industrial Policy 2010*



# Gaps with diff. provisions of Minamata Convention

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With regard to **Article 3, (Mercury supply sources and trade)** there is no current stock of mercury

With regard to **Article 4 (Mercury-added products)**, Bangladesh needs to align the import policy order with the hazardous waste and ship-breaking Rules, 2011 to ban the import of prohibited items under the Basel Convention and Annex A part 1 products.

With regards to **Article 8 (Emissions)**, although generic mercury emission standards have been set in Bangladesh, it needs to be made industry-specific.

With regard to **Article 9 (mercury releases to land and water)**, although there are some guidelines to restrict the release of mercury from wastes in land and water, the guidelines are not legally binding.



# Gaps with diff. provisions of Minamata Convention

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With regard to **Article 10 (environmentally sound interim storage of mercury)**, Bangladesh has to develop more specific guidelines for safe handling and storage of mercury.

With regard to **Article 11 (Mercury wastes)**, Bangladesh will need to consider how best to reduce emissions and releases from the waste sector, in particular through the improved management of end-of-life mercury-added products.

With regard to **Article 17 (Information Exchange)**, a national focal point on Mercury for exchange of information needs to be designated.





# Summary of Mercury Priorities

Plan	Title and Components	Articles Addressed	Lead Institutions
1	Legal and institutional arrangements to implement the convention at the national level	3, 4, 5, 8, 11, 14, 17, 18, 19, 21	DoE, MoI, NBR
2	Phasing down of dental amalgam	4, 11, 14, 18	DoE, DGHS, Bangladesh Dental Society, NBR
3	Phasing out of mercury-added products	4, 11, 14, 17, 18	DoE, DGS, BSTI
4	Environmentally sound management of solid and hazardous wastes	11, 14	City Corporations and municipalities, DGHS, DoE
5	Research and Development, information dissemination and mass awareness	14, 16, 17, 18, 19	Technical and scientific institutions, DoE





# Plan 1: Legal and institutional arrangements to implement the convention at the national level

Activities/Actions	Responsible agencies
<p><b>Incorporate obligations of the Minamata Convention into existing national legislation through amendments, particularly:</b></p> <p><b>(a) Incorporation the provision of keep records of current stocks of mercury in industries in the Hazardous Waste and Ship-breaking Waste Management Rules, 2011</b></p> <p><b>(b) Include the products listed in Part I of Annex A as banned items for import in the Import Policy Order</b></p> <p><b>(c) Include the products listed in Part I of Annex A as banned items for export in the Export Policy</b></p> <p><b>(d) In the Environmental Clearance Application process as per ECR 1997, ensure that processes listed in Annex B do not use mercury</b></p> <p><b>(e) Amend ECR 1997 to set industry-specific gaseous emission standards for mercury including standards for brick kilns, coal plants and applicable processes listed in Annex B</b></p> <p><b>(f) Separate directive with respect to monitoring and emission control technology of coal-based power plants need to be developed</b></p>	<p><b>Mol (for the import policy order and export policy) , DoE to coordinate</b></p>



# Plan 1: Legal and institutional arrangements to implement the convention at the national level

Activities/Actions	Responsible agencies
Establish a protocol for obtaining environmental clearance before importing mercury	DoE, NBR, Bangladesh Bank
DoE to enforce “environmental audits” in the industries using mercury as a condition for renewal of the license to operate.	DoE
Establishing a monitoring cell at the national level for mercury management in line with the provisions of Minamata Convention including: designating an information focal point, assigning staff and allocating resources for the development and implementation of action plans, reporting, information dissemination to public, identifying development assistance programmes, national strategies etc.	DoE
Establish and maintain a data management system (online) for current stocks of mercury, mercury usage, and emissions of mercury (as waste product). This will aid reporting of data and information pertaining to Bangladesh’s emissions and releases of mercury the progress of such implementation to the Conference of the Parties as required in implementing the Convention.	DoE



# Plan 1: Legal and institutional arrangements to implement the convention at the national level

Activities/Actions	Responsible agencies
Developing guidelines for environmentally safe operation of incinerators, hazardous waste recycling and re-refining	DoE
Inclusion of the provision of “Extended Producer Responsibility principle” in the Hazardous Waste and Ship-breaking Waste Management Rules, 2011 in order to foster active industry involvement of the industry to manage hazardous waste.	DoE
Developing a portal for inter-agency database sharing regarding import and export of mercury and mercury compounds.	DoE, NBR, Bangladesh Bank
Formulate mechanisms for implementation of existing guidelines for mercury management in different sectors, amend or modify existing standards if necessary	DoE
Financing local research to gain more understanding on the prevalence of mercury in various mercury-added products in Bangladesh and their potential health effects	DoE to arrange funding, universities and technical institutions to carry out research



# Plan 2: Phasing Down Dental Amalgam

Activities/Actions	Responsible agencies
<b>Prevent the use of dental amalgam, particularly for populations at risk (young children and pregnant women) while minimize the use of amalgam for other population groups</b>	DoE, DGHS, Bangladesh Dental Society
<b>Promote the use of alternative dental restorative materials by capacity building and awareness among dental practitioners (training of dental staff by national dental institutions), providing tax breaks for import of mercury-free restoration materials (increase affordability)</b>	DoE, DGHS, Bangladesh Dental Society, NBR
<b>In case of amalgam use, encourage the use in its encapsulated form with automatic mixing device by making it more affordable (tax breaks) and thereby reducing the probability of mercury wastage and exposure by dental practitioners</b>	DoE, NBR, Bangladesh Dental Society
<b>Establish and promote a system for the separate interim storage and collection of amalgam waste from dental clinics, providing occupational health and safety training to workers engaged in such systems</b>	DoE, DGHS, DCC, Bangladesh Dental Society
<b>Prepare a national policy and roadmap for phasing out and reducing the use of dental amalgam and managing mercury waste from dental clinics</b>	DoE, Bangladesh Dental Society



# Plan 3: Phasing Out Mercury-added Products

Activities/Actions	Responsible agencies/stakeholders
Separation, collection and environmentally-sound storage of mercury-added products such as batteries, lamps, medical equipment etc by electronic waste, medical waste and domestic waste handlers and recyclers, preparation and adoption of guidelines for safe use and disposal.	DoE, DGHS, Dhaka City Corporation
Raising public awareness to encourage regulation at individual household level regarding use and disposal of mercury-added products.	DoE
Making people aware of the dangers of using mercury-added skin cream products, making public the list of unregulated cream brands and their respective mercury content, modify existing standards of skin cream products if necessary	DoE, BSTI
Undertaking research and study on the pervasiveness of mercury in beauty products and making information available to public	DoE, academic and research institutions
Increasing enforcement activities (penalty, seizure of products, etc) against unsafe skin cream and beauty products manufacturing	DoE, BSTI



# Plan 4:Environmentally Sound Management of Solid and Hazardous Wastes

Activities/Actions	Responsible agencies
Eliminate open burning of solid and hazardous waste in dump sites, formulate and endorse solid waste management rules	City Corporations and municipalities, DoE to formulate guidelines/rules
Construct centralized facilities for their safe storage and management of electronic waste containing mercury and follow the best available techniques to segregate and dispose mercury waste.	City Corporations and municipalities, DoE to formulate guidelines/rules
Provide OHS training for workers engaged in hazardous waste management includingmercury in centralized facilities	City Corporations and municipalities, DoE
Prevent incineration of mercury waste in healthcare facilities, segregating mercury waste from medical waste and sending them to specialized facilities	DGHS, DoE



# Plan 5: Research and Development, information dissemination and mass awareness

Activities/Actions	Responsible agencies
Conduct surveys on the extent of contamination of mercury on various mercury-added products (skin-whitening creams, paints etc) and imported fishes in Bangladesh	DoE, BSTI
Design and conduct surveys of the mercury burden on vulnerable groups, including those subject to occupational exposure.	DoE, DGHS
Build expertise for research on mercury at the local level, increase capacity for better detection and analysis (equipment and technical manpower) of mercury in local institutions and participate in international networks conducting research on mercury	DoE, DGHS, BSTI, BCSIR
Develop capacity (manpower and equipment) for monitoring gaseous emissions of mercury from power plants, brick kilns, incinerators	DoE, BSTI, BCSIR



# Next steps

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- Ratification of the Minamata Convention
- Promulgation of the E-waste/solid waste rules
- Modification of the regulatory framework (e.g. import policy order)
- Incorporation of priority measures in the country-level planning process (e.g 8<sup>th</sup> FYP)
- Undertaking development projects for different priority actions





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12:00 AM, January 06, 2019 / LAST MODIFIED: 12:06 AM, January 06, 2019

# The Daily Star

Sunday, "January 6, 2019"

## Beauty s-care

*Mercury found way beyond limit in almost half of skin lightening creams available in market*



The market is flooded with skin lightening products by often obscure manufacturers. But there is not any effective monitoring of the level of mercury present in the seemingly innocuous products. Photo: Star