



# The State of Mercury in Sri Lanka



The Minamata Convention on Mercury is the first global agreement specifically designed to address contamination from a heavy metal. Opened for signature on October 10, 2013 and entered into force on August 16, 2017, the Convention seeks to address issues related to the use and release of mercury in trade and in industrial processes. The treaty also addresses major sources of atmospheric emissions and releases of mercury into the environment, as well as long-term storage and disposal of mercury and mercury compounds.

Under the Minamata Convention, individual countries are charged with protecting human health and the environment from the risks of mercury exposure, which involves systematically controlling mercury emissions and releases, including phasing out the use of mercury in certain products and processes.

In order to assist with preparations for the ratification and implementation of the Convention, the government of Sri

Lanka conducted a Minamata Initial Assessment (MIA). The primary activities of the MIA included:

- A review of institutional and capacity needs for implementation of the Convention;
- An assessment of national regulations, policies, and legislation to assist with preparations for compliance with the obligations of the Convention; and
- An identification of the primary sources of mercury emissions and releases as part of a detailed National Mercury Profile.

The MIA was conducted with financial assistance from the Global Environment Facility (GEF) and was implemented in collaboration with United Nations Industrial Development Organization (UNIDO). This brochure summarizes the primary mercury sources and risks identified through the MIA project in Sri Lanka.



# Findings from the Minamata Initial Assessment

## What are the Sources of Mercury?

The origin of mercury (Hg) can be natural (e.g., volcanoes) or anthropogenic (human-caused releases). The major sources of mercury in Sri Lanka, based on the mercury inventory conducted for the MIA, include the following (amount rounded):

- Use and disposal of mercury-added products (4,418 kg Hg/year or 58%)
- Waste incineration and open waste burning (1,229 kg Hg/year or 16%)
- Coal combustion and other fossil fuels (741 kg Hg/year or 10%)
- Informal dumping of general waste (396 kg Hg/year or 5%)
- Wastewater treatment (425 kg Hg/year or 5%)
- Use and disposal of dental amalgam fillings (331 kg Hg/year or 4%)



As a result of the MIA process, the approximate magnitude and source distribution of these anthropogenic releases into the air, water, and land are now quantified for Sri Lanka. Based on the MIA findings, the total calculated mercury input to society in Sri Lanka is 7,630 kg/year.

## How are People Exposed to Mercury?

Elemental mercury, which is found in manufactured products, is not necessarily toxic to humans. Exceptions may include dental amalgams and thimerosal, but these products are still under scientific investigation, so their potential harm is not yet fully characterized.

Methylmercury, the organic form of mercury, is toxic to humans because it can biomagnify in food webs and bioaccumulate over time in organisms. A neurotoxin, methylmercury can cause physiological harm and behavioral disorders in people.

Seafood, an important food source in Sri Lanka, can be a major source of methylmercury. In general, fish species that are smaller, short-lived, and forage low on the food web contain less methylmercury, while predatory species that are long-lived and grow larger contain higher levels of mercury. Many of the fish available in Sri Lanka are predatory and are high in the food web, however, fish mercury concentrations in the Indian Ocean tend to be lower than in the northern Pacific and Atlantic Oceans.

### Seafood with lower mercury levels (<0.22 ppm\*, ww\*\*; healthier choices):

- Goatfish (Nagari), Grouper (Kossa)
- Parrot Fish (Girawa)
- Lobster (Pokirissa), Octopus (Boowalla), Shellfish (Bellan)

### Seafood with higher mercury levels (>0.22 ppm, ww; riskier choices):

- Sailfish (Thalapath), Swordfish (Sappara)
- Tuna (Kelawalla)

Swordfish



Seafood is an important source of protein. It is important to include fish in your diet, but be sure to eat a variety of species and consider eating healthier choices on a more regular basis.

\*parts per million; \*\*wet weight



## How Does Mercury Affect Ecological Health?

The process of methylation, the conversion of mercury to methylmercury, varies widely on the landscape and within the waterscape. Areas that are particularly sensitive to mercury deposition—where methylation rates are highest and biomagnification in the food web is greatest, and where animals experience significant reproductive harm—are called biological mercury hotspots. These areas typically represent aquatic ecosystems or have an aquatic connection within the food web. Generally, ecosystems connected to wetlands, either marine (e.g., estuaries) or freshwater (e.g., lakes), are prime areas for high methylation rates. Fish and wildlife predators that live in estuaries

and lakes, or that forage in a food web associated with these habitats (e.g., beaches, coral reefs, and forests), contain elevated mercury levels. The combination of high methylation rates and longer-lived animals higher in the food web creates the greatest risk. It is unknown if Sri Lanka has biological mercury hotspots (i.e., where fish and wildlife reproductive success is harmed).

### Habitats of Greatest Risk

- Wetlands, lakes, estuaries, and aquatic habitats near contaminated sites

### Fish and Wildlife at Greatest Risk

- Tropicbirds, frigatebirds, terns, herons, and egrets



*Bridled Tern*



*Beaches and Coral Reefs*



*Lakes and Rivers*



*Forests*

## What is the Status of Mercury in Sri Lanka?

The Minamata Convention addresses the management of mercury and the risks it poses to human health and the environment. Provisions in the Convention assist countries in developing strategies to reduce mercury contamination.

Findings from the Minamata Initial Assessment in Sri Lanka indicate that the input of mercury into local ecosystems may be elevated in some areas, but with effort by the government, key stakeholders, and the general public, those inputs (e.g., coal burning) can be further identified and reduced.

Lifecycle management of mercury-added products (which includes the burning or dumping of wastes) also presents a challenge for Sri Lanka. The adoption of national legislation that limits and restricts the importation of such products will be an important first step towards the successful implementation of the Minamata Convention, which will help to reduce overall mercury releases in the country.

The impacts of regional mercury loads in the Indian Ocean and the effect on commercial fisheries, specifically swordfish and tuna, may require broader regional actions. However, with greater collaboration and cooperation across the region, the potential risks associated with mercury in the environment can be reduced.

### STEPS CONSUMERS CAN TAKE TO PROTECT AGAINST MERCURY CONTAMINATION

- Choose healthier dietary fish options (those with lower mercury levels).
- Purchase no- or low-mercury product replacements when possible (See Useful Links on back page for more information).
- Support legislation that helps reduce the impacts of mercury on the environment.

## Recommendations from the Sri Lankan Mercury Team

- Create legislation that can help facilitate a framework to comply with the Minamata Convention.
- Promote mercury-free alternative consumer products and medical equipment (which are already widespread on the market):
  - Replace compact and linear fluorescent lights with Light Emitting Diode (LED) bulbs;
  - Choose brands of batteries that do not contain mercury;
  - Check the ingredients in skin lightening creams and lotions to avoid products that contain mercury;
  - Replace outdated medical/measuring devices containing mercury with digital alternatives; and
  - Generate greater awareness and education through existing outreach programs; oversee the development and distribution of information on mercury to the public, including importers of manufactured products.
- Develop proper separation methods for the disposal of mercury-added products, both at the household consumer level and in landfill management procedures.
- Improve public access to environmentally sound facilities/locations that could aid in the disposal process, as well as provide information and guidelines on disposing of mercury-added products.
- Improve management of mercury releases from industrial processes through the implementation of best available techniques/best environmental practices to ensure maximum control and reduction of mercury emissions and releases. The efficiencies of these measures should be continuously monitored and evaluated. It is also recommended that the locations for development of future industries/processes/disposal sites should be considered with respect to environmentally sensitive areas.
- Participate in global mercury database and monitoring programs involving global and regional sampling efforts organized by UN agencies, including:
  - Hair samples (for people);
  - Muscle samples (for fish);
  - Blood, feather, and egg samples (for birds);
  - Sampling of cosmetic skin lightening creams; and
  - Air sampling with passive devices.

### For More Information:

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## MIA Stakeholders

- Ministry of Education
- Ministry of Finance
- Ministry of Fisheries
- Ministry of Health, Nutrition and Indigenous Medicine
- Ministry of Higher Education
- Ministry of Industry and Commerce
- Ministry of Local Government and Provincial Councils
- Ministry of Mahaweli Development and Environment
- Ministry of Power and Renewable Energy
- Ministry of Science, Technology and Research
- Central Environment Authority
- Centre for Environmental Justice
- Consumer Affairs Authority
- Coordinating Secretariat Science, Technology and Innovation
- Cosmetic Devices and Drugs Regulatory Authority
- Dental Institute
- Department of Meteorology
- Faculty of Chemical and Process Engineering, University of Moratuwa
- Gem and Jewellery Research and Training Institute
- Import and Export Control Department
- Industrial Development Board of Ceylon
- Industrial Technology Institute
- Institute of Indigenous Medicine
- Institute of Oral Health
- Marine Environmental Protection Authority
- National Aquatic Resource Research and Development Agency (NARA)
- National Aquatic Resources Research and Development Agency (NAARA)
- National Cleaner Production Centre
- National Engineering Research and Development Centre of Sri Lanka
- National Gem and Jewellery Authority
- Post Graduate Institute of Agriculture, University of Peradeniya
- Sri Lanka Customs
- Sri Lanka Standards Institution
- Sri Lanka Sustainable Energy Authority

### BRI's Mercury Work in Sri Lanka

Biodiversity Research Institute (BRI) collaborates with its partners in Sri Lanka to help identify and estimate any major mercury sources in the region. An international advisor on mercury, BRI serves as co-lead of United Nations Environment's Mercury Air Transport and Fate Research partnership area to assist with the development of a global mercury monitoring and observation system. In addition, BRI is an executing agency for the United Nations Industrial Development Organization and an International Technical Expert for the United Nations Development Programme and the United Nations Environment Programme to conduct MIA activities in several countries.