



# The State of Mercury in Mauritius



**T**he Minamata Convention on Mercury is a global agreement specifically designed to address contamination from a heavy metal. Opened for signature on 10 October 2013 and entered into force on 16 August 2017, the Convention seeks to address issues related to the use and release of mercury in trade and in industrial processes. The Convention 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 by systematically controlling mercury emissions and releases, including phasing out the use of mercury in certain products and processes.

Mauritius became a signatory of the Convention on 10 October 2013. In order to assist with preparations for the ratification and implementation of the Convention, the Government of Mauritius conducted a Minamata Initial

Assessment (MIA). The primary activities of the MIA project in Mauritius 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
- Identification of 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 the United Nations Development Programme and the Ministry of Social Security, National Solidarity, and Environment and Sustainable Development (Environment and Sustainable Development Division). Consequently, Mauritius ratified the Convention on 21 September 2017. This brochure summarizes the major findings of the MIA.



# Findings from the Mercury Initial Assessment

## What are the Sources of Mercury?

Mauritius used the UN Environment's *Toolkit for Identification and Quantification of Mercury Releases* (Level 2) to conduct its national mercury inventory. The total anthropogenic releases of mercury in Mauritius in 2014 was estimated to be 671 kilograms (kg). The primary sources include the following:

- Use and disposal of mercury-added products (40%)
- Combustion of fossil fuels (16%)
- Mercury release from dental amalgam and other medical products (19%)



Overall, lifecycle management of mercury-added products, including the importation, use, and disposal, represents a significant source of mercury emissions in Mauritius. Examples of such products include compact fluorescent lamps as well as dental amalgam and medical devices that contain mercury.



Reservoirs

## How are People Exposed to Mercury?

Elemental mercury, which is found in manufactured products, is not necessarily toxic to humans. Exceptions may include dental amalgam and cosmetics, 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.

Fish from the sea or freshwater systems can be a major source of methylmercury. In general, fish species that are small, short-lived, and forage low in the food web contain less methylmercury, while predatory species that are long-lived and grow larger can contain higher levels of methylmercury.

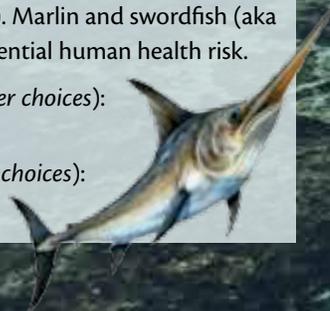
As part of the MIA in Mauritius, a rapid assessment of mercury in select fish species was conducted. Preliminary results suggest most of the fish sold in local markets do not exceed the human health criteria established by the Food Regulation Act of 1999 in Mauritius of 1.0 parts per million, wet weight (ppm, ww). Marlin and swordfish (aka espadon) were elevated in mercury and do represent a potential human health risk.

**Seafood with lower mercury levels** (<1.0 ppm,ww; *healthier choices*):

- Vieille rouge, Queque blanc, Capitaine

**Seafood with higher mercury levels** (>1.0 ppm,ww; *riskier choices*):

- Marlin, Swordfish



Lagoons

## 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 generally represent aquatic ecosystems or have an aquatic connection within the food web.

Generally, aquatic 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., mangroves), often contain elevated mercury levels. The combination of high methylation rates and longer-lived animals higher in the food web creates the greatest risk.

The MIA project identified two landfills, one on Mauritius and one on Rodrigues, as potential contaminated sites (see Article 9 of the Minamata Convention). Leachate from the Mare Chicose landfill was analyzed for mercury and was found to be less than 0.0002 mg/L.

Ambient mercury concentrations at the Mare Chicose site and the Roche Bon Dieu dump on Rodrigues were found to be low, ranging from 2.95 to 15.25 nanograms of mercury per cubic meter ( $\text{ng}/\text{m}^3$ ), well below the World Health Organization guideline of 1.0 milligrams per  $\text{m}^3$ .

### Habitats at Greatest Risk:

- Wetlands, mangroves, aquatic habitats near contaminated sites

### Wildlife at Greatest Risk:

- Tropicbirds, Wedge-tailed Shearwaters, Round Island Petrel, Noddys, Bridled Terns, Fairy Terns



Red-billed Tropicbird



Black River Gorges National Park



Coral Reefs/Beaches

## What is the State of Mercury in Mauritius?

The impacts of mercury pollution can be challenging to identify and reverse. However, strategies to reduce mercury contamination are important because mercury can cause significant adverse effects to human and ecological health.

Findings from the MIA in Mauritius indicate that lifecycle management of mercury-containing products presents the biggest challenge for the small island developing state (SIDS). The adoption of legislation that limits and restricts the importation of such products will be an important first step towards the successful implementation of the Minamata Convention that will help to reduce overall mercury releases on the island.

Like many SIDS, regional atmospheric mercury loads may be impacting the country's marine fisheries. Overall,

national emissions are low and with greater collaboration and cooperation across the region, the potential risks associated with mercury in the environment can be reduced.

### WHAT CAN YOU DO TO HELP?

- Choose healthier fish options (those with lower mercury levels) as part of your diet.
- Use your buying power—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 National Mercury Team in Mauritius

- Create legislation that can help facilitate a framework to comply with the Minamata Convention.
- Reduce the import and use of products that contain mercury by selecting no- or low-mercury product replacements:
  - Replace compact and linear fluorescent lights with LED bulbs
  - Check the ingredients in skin lightening creams and lotions to avoid products that contain mercury
  - Choose brands of batteries that do not contain mercury
- Properly store waste products with mercury and avoid using landfills by creating proper storage facilities for hazardous waste.
- 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.
- Participate in global mercury database and monitoring programs and coordinate existing data with global efforts organized by UN Environment:
  - Use hair samples for people
  - Use muscle samples for fish
  - Use blood, feather, and egg samples for birds

## About Mauritius

Mauritius is a small, multicultural island nation located in the Indian Ocean, east of Madagascar, northeast of Reunion, and southeast of the Seychelles. Mauritius also controls Rodrigues Island and the remote, sparsely populated Agalega and Cargados Garayos (Saint Brandon) islands. The Mauritian economy is based mainly on the manufacturing, financial, and tourism sectors.

### BRI's Mercury Work in Mauritius

Biodiversity Research Institute (BRI) has collaborated with its partners in Mauritius to help identify and estimate major mercury sources in the country. As an International Technical Expert, BRI provided training on the UN Environment's *Toolkit for Identification and Quantification of Mercury Releases* (Level 2) and assisted with the review of primary reports and products developed as part of the MIA.

BRI is also a co-lead of the UN Environment's Mercury Air Transport and Fate Research partnership area and assists with the design and development of a global mercury monitoring and observation system to assist with the evaluation of the effectiveness of the Minamata Convention in its mercury reduction strategies.

### Useful Links

- BRI publications on mercury: [www.briloon.org/hgpubs](http://www.briloon.org/hgpubs)
- Minamata Convention: [www.mercuryconvention.org](http://www.mercuryconvention.org)

## Global Health Trade-Off for Mercury and Omega-3 in Fish

Milligrams of Omega-3 Fatty Acids/4 Ounces of Cooked Fish →				
MEAL FREQUENCY RECOMMENDATIONS	<500 mg	500-1,000 mg	1,000-2,000 mg	> 2,000 mg
Unrestricted meals (< 0.05 µg/g)	Catfish, Clams, Crab* (most species), Croaker, Haddock, Scallops, Shrimp, Tilapia*	Blue Mussels,* Pink Salmon, Sockeye Salmon	Chinook Salmon,* Coho Salmon, Oysters	Atlantic Salmon, Sardines, Shad <b>Healthier Choices</b>
1-2 meals per week (0.05–0.22 µg/g)	Atlantic and Pacific Cod, Flounder, Grenadier, Hake, Lobster,* Sole	Atlantic Pollock, Mahi Mahi, Mullet, Scad, Squid, Skipjack Tuna, any canned tuna	Atlantic Horse Mackerel, European Sea Bass, Rays, Skates, Trout	Anchovies,* Herring
1 meal per month (0.22–0.95 µg/g)	Grouper, Orange Roughy, Snapper	Amberjack, Barracuda, Bigeye Tuna, Bluefish, Halibut, Jack, Trevally, Wahoo, Yellowfin Tuna	Atlantic and Pacific Mackerel, Albacore Tuna,* Atlantic Bluefin Tuna, Chilean Sea Bass	 Mercury concentrations vary widely across shark species. To learn more, visit: <a href="http://www.briloon.org/hgcenter">www.briloon.org/hgcenter</a>
No consumption (> 0.95 µg/g)	King Mackerel <b>Riskier Choices</b>	Marlin, Sailfish, Tilefish	Dogfish, Ground, and Mackerel Sharks; Pacific Bluefin Tuna, Swordfish*	

Data Sources: BRI's Global Biotic Mercury Synthesis (GBMS) Database; U.S. Environmental Protection Agency; U.S. Food and Drug Administration  
\* Pictured species; Underlined – species found in the Indian Ocean.

## MIA Stakeholders

### Government Agencies/Ministries:

- Attorney General's Office
- Ministry of Agro Industry and Food Security
- Ministry of Education and Human Resources, Tertiary Education and Scientific Research
- Ministry of Energy and Public Utilities
- Ministry of Finance and Economic Development
- Ministry of Foreign Affairs, Regional Integration and International Trade
- Ministry of Gender Equality, Child Development and Family Welfare
- Ministry of Health and Quality of Life
- Ministry of Industry, Commerce and Consumer Protection
- Ministry of Local Government and Outer Islands
- Ministry of Labour, Industrial Relations, Employment and Training
- Ministry of Ocean Economy, Marine Resources, Fisheries, and Shipping
- National Environmental Laboratory
- Solid Waste Management Division

### Councils/Non-Governmental Organizations:

- PANEM
- Zero Mercury Working Group

### Government Departments/Parastatal Organizations Maintaining Revenue Authority:

- Central Water Authority
- Food and Agricultural Research and Extension Institute
- Mauritius Cane Industry Authority
- Mauritius Standards Bureau
- National Assay Office

### Academia:

- University of Mauritius
- University of Technology

### Private Sector:

- Mauritius Chamber of Commerce and Industry

## For More Information:

Mr. Rajiv Beedassy, Divisional Environment Officer  
Ministry of Social Security, National Solidarity, and Environment and Sustainable Development  
(Environment and Sustainable Development Division)  
[rbeedassy@govmu.org](mailto:rbeedassy@govmu.org)



## Credits

Cover: Le Morne Brabant and the blue lagoon, Mauritius © ohrim–shutterstock; Pages 2-3: Backdrop image: Mauritius underwater falls © flickr; Reservoirs © The Visual Explorer–shutterstock; L'île aux Cerfs and the lagoon of Mauritius © Karl Ahnee–shutterstock; Black River Gorges National Park © Benny Marty–shutterstock; Coral reefs © Quality Master–shutterstock; Lightbulb/mercury © shutterstock; Dental amalgam © Albund–dreamstime.com; Swordfish © shutterstock; Red-billed Tropicbird © Keith Pritchard–shutterstock; Fish Matrix © Biodiversity Research Institute