



50
YEARS

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MERCURY MANAGEMENT

FOR SUSTAINABLE DEVELOPMENT

FOREWORD



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Mercury is a naturally occurring heavy metal. As one of the oldest known elements, it has been used throughout history for various purposes. Since the industrial revolution, however, mercury releases have increased, primarily from artisanal and small-scale mining, power generation, and industrial processes. This has led to an increase in mercury pollution in the global environment. We now know that mercury is highly toxic, causing significant adverse neurological and other health effects in humans and other lifeforms. Once released into the environment, mercury persists, circulating within the atmosphere, water, soil, and biota. Mercury can be taken up by microorganisms, accumulating up the food chain. Moreover, atmospheric mercury can be transported over long distances. This provides the *raison d'être* for a global convention to reduce the dangers from mercury pollution. UNDP is supporting several countries in phasing out and reducing mercury use. UNDP stands ready to continue this support to help safeguard human and ecosystem health.

PREFACE



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We are delighted to share with you the interim results of UNDP's work in protecting human health and the environment from mercury, in support of the Minamata Convention. This *"Mercury Management for Sustainable Development"* publication highlights UNDP's previous and current mercury activities and describes our future focus areas on mercury management, with funding from the Global Environment Facility (GEF). Improving the management of chemicals and wastes is an important priority for the GEF. UNDP supports countries to fulfill their future obligations under the Minamata Convention, to phase-out the use of mercury and reduce its releases from artisanal and small-scale gold mining, industrial processes, power generation, and mercury-containing products, among other sources.

UNDP's expertise and experience, built up over two dozen years of work in eliminating ozone depleting substances and Persistent Organic Pollutants (POPs), will be utilized in addressing mercury. This will also contribute towards achieving the target of the sixth GEF funding cycle of reducing 1,000 tonnes of mercury by 2018 in an environmentally sound manner.

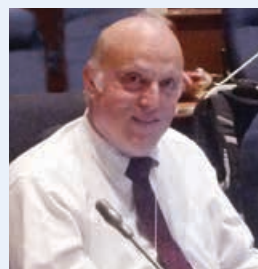
INTRODUCTION

While the Minamata Convention is expected to enter into force by the end of 2016, UNDP, with funding from the GEF, is already assisting countries in phasing out and reducing mercury use. In addition to the mercury priorities highlighted in this publication, UNDP's work in support of the Minamata Convention also seeks to achieve synergies and linkages with other multilateral environmental agreements (MEAs), the Sustainable Development Goals (SDGs) and human development goals.

For example, our artisanal and small-scale gold mining programmes address environmental issues such as water siltation, deforestation, loss of biodiversity, soil erosion as well as socioeconomic aspects such as child labour, health protection and alternative livelihoods (in alignment with UNDP's Strategy on Extractive Industries). Interventions that reduce mercury releases from industrial processes or introduce alternatives to mercury-containing consumer products (such as CFLs) achieve climate co-benefits by introducing cleaner and more efficient technologies and reducing reliance on non-renewable resources.

Ultimately, all our activities that phase-out the use of mercury, reduce mercury releases to the environment and improve the management of mercury in general, prevent mercury from entering water bodies. This helps to protect marine and coastal biodiversity, fishermen's livelihoods, and reduce the buildup of mercury in the food chain and thus in humans, as a result protecting our health and that of future generations.

UNDP currently supports 42 countries with a GEF mercury portfolio of \$22 million in grants and \$32 million in co-financing. We hope these initial results – presented in this publication to be launched at the seventh session of the Intergovernmental Negotiating Committee on Mercury (INC-7) in Jordan in March 2016 – will inspire more effective mercury reduction and phase-out practices.



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EXAMPLE OF SYNERGIES: DEGRADATION OF LAND AND BIODIVERSITY CAUSED BY ASGM IN THE AMAZON.



EXAMPLES OF SYNERGIES: MARINE AND FRESHWATER ECOSYSTEMS. SEDIMENT BEING DUMPED WHILE SEARCHING FOR GOLD ON TONLE SAP RIVER, CAMBODIA. PHOTO BY MEUNIERO/SHUTTERSTOCK.COM

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MINER DEMONSTRATING THE USE OF MERCURY IN ASGM IN SEGOVIA, COLOMBIA. PHOTO BY PATRICK FRIES.

THE MINAMATA CONVENTION ON MERCURY

In 2009, negotiations on a United Nations treaty on mercury were initiated. These negotiations were concluded in January 2013 when an agreement was reached by delegates from over 140 countries, leading to the establishment of the Minamata Convention on Mercury.

The Minamata Convention on Mercury is a global legally binding treaty to protect human health and the environment from the adverse effects of mercury. The Convention was named after a city in Japan where mercury poisoning occurred after industrial wastewater from a chemical factory was discharged into Minamata Bay in the mid-20th century. The wastewater contained methylmercury, which bioaccumulated in fish and shellfish in the bay. Those who consumed seafood from Minamata Bay became very sick, with 1,784 people dying and hundreds developing severe disabilities.

The objective of the Minamata Convention is to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. Major highlights of the Convention include a ban on new mercury mines, the phase-out of existing mercury mines, control measures on air emissions, and international regulation of the informal sector for artisanal and small-scale gold mining. The Convention aims to reduce mercury releases from all sources, including artisanal and small-scale gold mining, coal combustion, cement production, production of (non-)ferrous metals, disposal of waste from mercury-containing products, chlor-alkali plants, among many others.

The Convention will enter into force 90 days after it has been ratified by 50 nations. As of December 2015, 128 countries signed and 20 countries ratified the Convention. It is expected that 50 countries will have ratified the Convention by mid-2016 and that the Convention will enter into force by the end of 2016.



MINAMATA MEMORIAL — AT NIGHT, A LIGHT ILLUMINATES THE CHROME SPHERES, WHICH REPRESENT THE SOULS OF THOSE POISONED BY METHYL MERCURY DUMPED INTO THE BAY. PHOTO BY TODD STRADFORD.

UNDP AND THE MINAMATA CONVENTION ON MERCURY

UNDP has been active in the area of mercury reduction efforts since the 1970s, when it administered the UN Revolving Fund for Natural Resources Exploration (UNRFRNE) from 1975 to 1995 and implemented a number of artisanal and small-scale gold mining (ASGM) projects financed by the revolving fund.

Since then, UNDP has continued assisting developing countries and countries with economies in transition in their efforts to reduce the use and release of mercury. Such efforts have mainly focused on the extractives sector, by supporting the phase-out of mercury used in mining to extract gold, and on the health sector, where we support the phase-out of mercury-containing medical devices and the reduction of mercury emissions. In addition, the adoption of the Minamata Convention on Mercury with the Global Environment Facility (GEF) as its financial mechanism has created new avenues and opportunities for providing financial and technical support to countries to assist them in reducing releases of mercury.

To assist countries prepare for the ratification of the Minamata Convention, meet their future commitments under the Convention and reduce releases of mercury from various sectors and release sources, UNDP, with the financial support of the GEF, supports countries in:

- Conducting Minamata Initial Assessment (MIA) activities and ASGM National Action Plans (NAPs). MIAs include mercury inventories and assessments of the legal and regulatory frameworks as well as institutional and technical capacity needs.
- Reducing emissions of mercury and mercury compounds to the atmosphere from point sources (e.g. coal-fired industrial boilers, incinerators, smelting and roasting processes used in the production/recycling of non-ferrous metals).
- Phasing-out mercury-containing products in the healthcare sector (e.g. thermometers, blood pressure meters, dental amalgam, etc.).





MINERS SEPARATING GOLD FROM SEDIMENTS IN ASGM OPERATIONS IN SHINYANGA, TANZANIA. PHOTO BY AFRICA924/SHUTTERSTOCK.COM.

- Lifecycle management (LCM) of mercury, mercury-containing products and wastes (including treatment and storage).
- Reducing and eliminating the use of mercury in ASGM, and minimizing mercury releases to the environment from mining and processing.

UNDP has already provided support or is initiating support to a total of 42 countries to implement mercury-related projects through national, regional and global projects. An overview of these projects is shown in Table 1.

UNDP's current mercury portfolio amounts to \$22 million in GEF grants and \$32 million in co-financing. Considering that the current cycle

(GEF-6) is the first replenishment cycle of the GEF which has included considerable funding to address issues related to mercury, it is expected that in the future, UNDP will support additional countries in addressing the management of mercury.

In addition, UNDPs "*Strategy for Sustainable Development and Equitable Management of the Extractive Industries*" seeks to improve the benefits from fiscal revenues, jobs and incomes while minimizing negative effects on the environment, accountability, social and gender equality, and conflict. UNDP's current global portfolio related to extractive industries has over 70 projects in over 50 countries.

Table 1: UNDP/GEF Projects on Mercury (2002–2015)¹

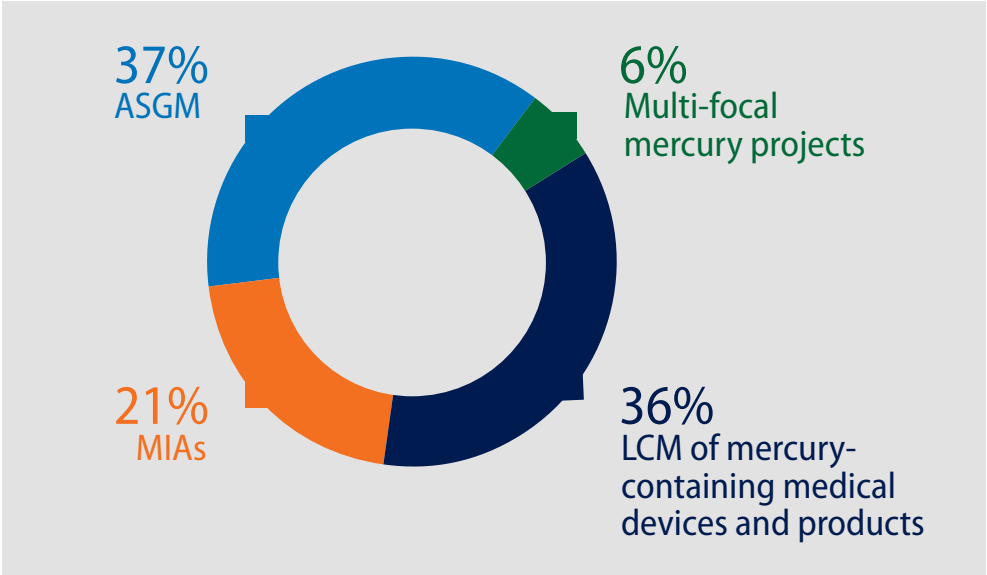
Country	Mercury Area	GEF Grant (US\$)	Status
Global (Brazil, Lao PDR, Indonesia, Sudan, Tanzania and Zimbabwe)	ASGM	6,806,800	Financially Completed
Global (Argentina, India, Latvia, Lebanon, Philippines, Senegal and Viet Nam)	LCM and phase-out of mercury-containing medical devices and products	PPG ² : 144,990 2,210,281	Operationally Completed
Global (Bangladesh, Guinea Bissau, Mauritania, Mozambique and Samoa)	Minamata Initial Assessment	1,000,000	Ongoing
Regional (Ghana, Madagascar, Tanzania and Zambia)	LCM and phase-out of mercury-containing medical devices and products	PPG: 40,000 1,290,639	Ongoing
Regional (Bolivia and Peru)	ASGM	1,312,750	Ongoing
Albania	Minamata Initial Assessment	200,000	Ongoing
Azerbaijan	Minamata Initial Assessment	200,000	Ongoing
Bosnia & Herzegovina	Minamata Initial Assessment	200,000	Ongoing
Burkina Faso ³	ASGM	120,000	Operationally Completed
Colombia	LCM and phase-out of mercury-containing medical devices and products	PPG: 30,000 1,120,000	Ongoing/ Approved
Costa Rica	Minamata Initial Assessment	200,000	Ongoing
Egypt	LCM and phase-out of mercury-containing medical devices and products	PPG: 28,000 820,000	Ongoing
Georgia	Minamata Initial Assessment	200,000	Ongoing
Guyana	Minamata Initial Assessment	200,000	Ongoing
Honduras	ASGM/LCM and phase-out of mercury-containing medical devices and products	PPG: 70,000 1,300,000	Ongoing
India	Minamata Initial Assessment	1,000,000	Ongoing
Jordan	Minamata Initial Assessment	200,000	Ongoing
Kazakhstan	LCM and phase-out of mercury-containing medical devices and products	PPG: 25,000 680,000	Ongoing
Kyrgyzstan	LCM and phase-out of mercury-containing medical devices and products	PPG: 15,000 285,000	Ongoing
Malaysia	Minamata Initial Assessment	250,000	Ongoing
Mauritius	Minamata Initial Assessment	199,749	Ongoing
Mauritius	Partnership Initiative for SAICM	46,207	Financially Completed
Montenegro	Minamata Initial Assessment	200,000	Ongoing
Panama	Minamata Initial Assessment	200,000	Ongoing
Seychelles	Minamata Initial Assessment	199,100	Ongoing
Uruguay	LCM and phase-out of mercury-containing medical devices and products	PPG: 35,000 1,237,800	Ongoing

¹ In some cases, the management of mercury is a small component of a larger project focusing on reducing/phasing out other chemicals. For these medical waste projects, a 20% mercury component was applied to projects.

² PPG = project preparation grant.

³ Funded by Sweden as part of the Poverty Environment Initiative (PEI).

Figure 1: UNDP Mercury Portfolio by type of project



UNDP's key approaches to assisting countries to advance the sound management of mercury include:

Advocacy and Awareness Raising —

Campaigning among stakeholders, decision-makers and population groups at risk on the importance of mercury reduction, phase-out and its management.

Capacity Building — Identification of innovative and successful practices; policy, regulatory and institutional enhancements to help countries put in place mercury management systems; identification of financing needs and options; application of lessons learned and experiences from other countries; and development and application of guidelines and tools to facilitate the management and monitoring of mercury.

Technical Assistance — Supporting countries in identifying and introducing Best Environmental Practices (BEP) and Best Available Technologies (BAT), along with customized training for their use and application, which have proven successful elsewhere and will help address national challenges and constraints with regards to the sound management of mercury.

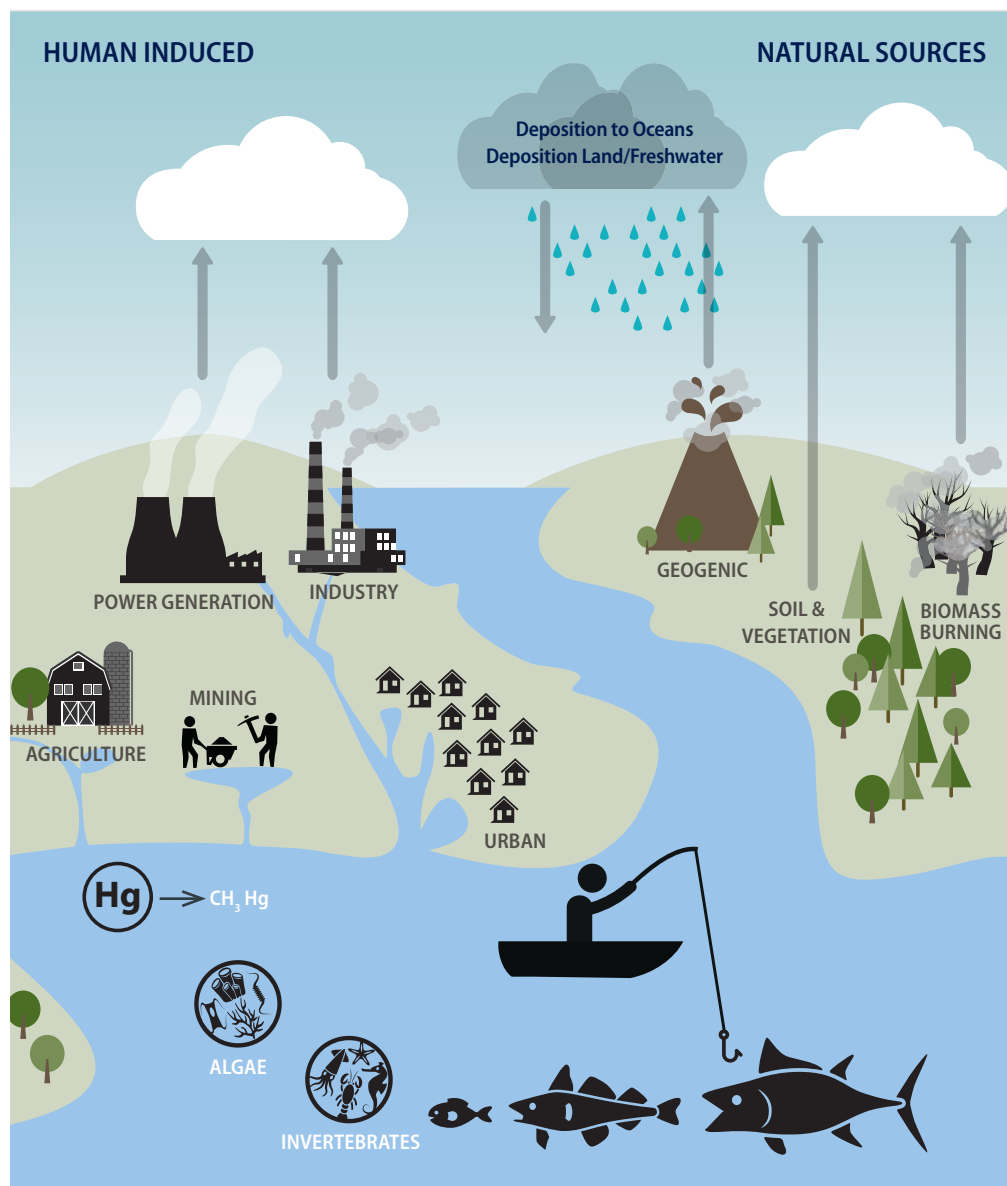
Monitoring — Assisting countries to assess their situation relating to mercury and tracking their progress towards reducing its use and releases.



WARNING SIGN FOR MINERS IN TARKWA DISTRICT IN GHANA.
PHOTO BY DAVID BUCK.

The REALITY of Mercury Management

Mercury is a chemical of global concern owing to its long-range atmospheric transport, its persistence in the environment once anthropogenically introduced, its ability to bioaccumulate in ecosystems and its significant negative effects on human health and the environment.

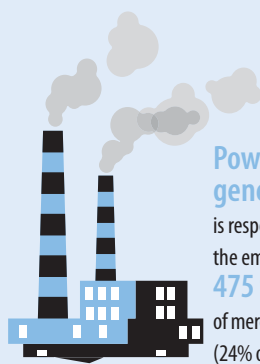




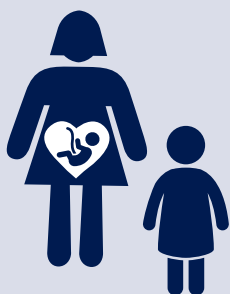
Mercury is considered by WHO as one of the **top TEN** chemicals or groups of chemicals of major public health concern.¹



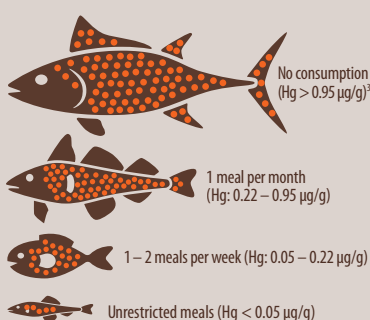
35% of mercury releases result from **gold mining**.²



Power generation is responsible for the emission of **475 tonnes** of mercury each year (24% of total emissions).²

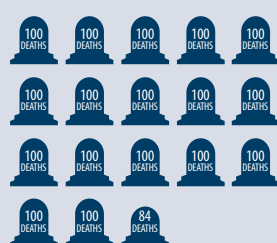


Mercury is most harmful to the development of the child in utero and early in life.¹



The consumption of fish containing high levels of mercury, in particular those high on the food chain as mercury bioaccumulates, can have serious health consequences.

1 ORANGE DOT = 1 µg Hg/g fish



As of March 2001, **2,265 victims** had been officially recognised as having Minamata disease (**1,784** of whom had **died**)⁴ and over 10,000 received financial compensation⁵ because of their potential exposure to mercury.



Among selected subsistence fishing populations, out of **1,000 children**, between **1.5 and 17** showed cognitive impacts caused by the consumption of fish containing mercury.¹



Phasing-out the use of non-essential mercury-containing products for which cost-effective alternatives exist is the most effective way to reduce releases from products and waste streams.



Approximately **15 million people**, including approximately **3 million women and children**, participate in the ASGM industry in 70 countries.⁶

The Sustainable Development Goals (SDGs) and the Minamata Convention on Mercury

The Minamata Convention aims to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. Supporting countries in their efforts to prepare for and meet their future commitments under the Minamata Convention is an important component of UNDP's efforts to achieve sustainable, inclusive and resilient human development through the SDGs, which were adopted in September 2015. Some of the key linkages between UNDP's work in support of the Minamata Convention's efforts to reduce the use/phase-out of mercury and the SDGs are highlighted below.



SDG Goal 1: End poverty in all its forms everywhere

The urban and rural poor routinely face unacceptably high risks of exposure to mercury because of their occupations (e.g. mercury mining, artisanal and small-scale gold mining, waste management, recycling), living conditions (proximity to dumpsites and incinerators) and lack of knowledge of potential health impacts of exposure to mercury. At the same time, ecosystems that provide essential resources for the survival of the rural poor, are affected by mercury contamination. UNDP-supported interventions assist partners in introducing alternatives, best practices and techniques to minimize the use and release of mercury, and also address the underlying socio-economic challenges that are at the core of existing practices that use mercury.



SDG Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

One of the main sources for exposure to mercury is through consumption of mercury-contaminated fish and shellfish. The consumption of fish containing high levels of mercury, in particular those high on the food chain as mercury bioaccumulates, can have serious health consequences (see SDG 3). This causes health concerns, in particular for pregnant women, the child in utero and young children, as well as for poor communities relying on subsistence fishing. UNDP helps countries decrease the use of mercury and its release into the environment from various sectors, indirectly halting and reducing the build-up of mercury in the food chain.



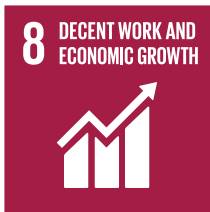
SDG Goal 3: Ensure healthy lives and promote well-being for all at all ages

Mercury is toxic to human health, posing a particular threat to the development of the child in utero and early in life. Human exposure occurs mainly by inhaling elemental mercury vapors during industrial processes and by consuming contaminated fish and shellfish, and can lead to mercury poisoning. Mercury exists in various forms: elemental; inorganic; and organic, which all have different toxic effects, including on the nervous, digestive and immune systems, and on lungs, kidneys, skin and eyes. UNDP supports governments, the private sector and other partners, to reduce or preferably phase-out the use of mercury and mercury-containing products, and minimize its releases, to ultimately protect human and environmental health.



SDG Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Coal burning, and to a lesser extent the use of other fossil fuels to generate energy, is the second most significant anthropogenic source of mercury emissions into the atmosphere. Use of air pollution controls and more stringent regulations, combined with improved combustion efficiency, can offset most of the mercury releases associated with the increase in coal use, particularly in Asia and South America. However, reductions in current mercury releases will only be achieved after a shift to cleaner and more sustainable energy sources and the introduction of more efficient technologies and products (e.g. mercury-free energy-efficient lighting). UNDP supports countries in strengthening their regulatory frameworks, revising outdated industrial processes and technologies to reduce releases and increase efficiency and, most importantly, in adopting clean energy solutions.



SDG Goal 8: Decent work and economic growth

Exposure to mercury can occur through the inhalation of mercury vapors. Such exposure is most likely to happen in the workplace. Among the most dangerous professions and livelihoods in terms of mercury exposure are artisanal and small-scale gold mining, waste handling and recycling, mercury refining, and health and dental care. Phasing-out the production and use of products and processes which use mercury is the main way to reduce worker exposure. We assist governments and various sectors introduce mercury-free products and processes, while also supporting the development of workplace safety standards and procedures, introducing personal protective measures, and addressing the underlying socio-economic causes that led to the use of mercury and products containing mercury.



SDG Goal 12: Ensure sustainable consumption and production patterns

Sustainable consumption and production aims at "doing more with less," increasing net welfare gains from economic activities by reducing resource use, degradation and pollution, while increasing the quality of life. An important aspect of our work is the reduction of mercury pollution and mercury-containing wastes by introducing alternative products, processes and technologies that are mercury-free, cost-effective and in line with best available technology guidelines. Such interventions are aligned with those that increase resource efficiency, use clean and renewable energy, and reduce waste generation, all of which have important mercury reduction co-benefits.



SDG Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Over three billion people depend on marine and coastal biodiversity for their livelihoods, which are being threatened by marine pollution reaching alarming levels. Mercury levels in certain types of fish (e.g. bluefin tuna, swordfish) have become so high that some Governments advise against consumption or have introduced import bans. UNDP helps countries decrease the use and release of mercury from various land-based activities, prevent mercury from entering water sources, and reduce the build-up of mercury in the food chain.

UNDP SIGNATURE PROGRAMMES IN MERCURY MANAGEMENT

- UNDP is supporting MIAs and/or NAPs in 19 countries.
- UNDP prepared a guidance document to support governments, national stakeholders, experts and UN agencies on MIA implementation.

Mercury Inventories and Preparation of MIAs and NAPs

The GEF, which serves as the financial mechanism for the Minamata Convention, provides funding to eligible countries for Enabling Activities (EAs) that lead to the preparation of Minamata Initial Assessments (MIAs) and National Action Plans (NAPs) for ASGM. Such initial assessments enable a country to determine what is needed in order to ratify the Minamata Convention and provide a basis for further work towards its implementation.

UNDP supports countries in preparing MIAs and NAPs in accordance with the GEF's initial guidelines for enabling activities for the Minamata Convention on Mercury:

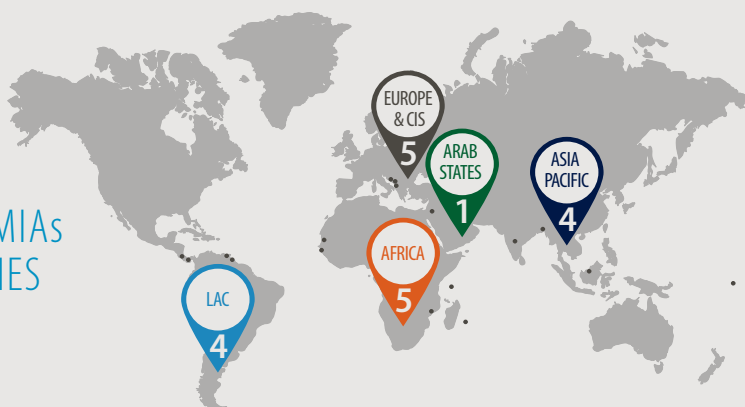
MIA interventions:

- Initial inventory of mercury (stocks, import, export, supply, use per sector, trade, etc.).
- Identification of emission sources and release sources.
- Assessment of legislation and policies with regards to the implementation of the provisions of the Convention.
- Assessment of the institutional and capacity needs to implement the Convention.
- Preparation of an Action Plan.

NAP interventions:

- Establishing a coordinating mechanism and organization process.
- Developing a national overview of the ASGM sector, including baseline estimates of mercury use and practices.
- Setting goals, national objectives and reduction targets.
- Formulating an implementation plan.
- Developing an evaluation mechanism for the NAP.
- Endorsing and submitting the NAP.

UNDP IS
SUPPORTING MIAs
IN 19 COUNTRIES



Reducing Mercury Emissions from Point Sources

An important source of mercury emissions are from Point Sources, which are defined by the Convention as:

- Coal-fired power plants
- Coal-fired industrial boilers
- Smelting and roasting processes used in the production of non-ferrous metals
- Waste incineration facilities
- Cement clinker production facilities

A Minamata Convention Party with relevant sources is required to take measures to control emissions and may prepare a national plan setting out the measures to be taken to control emissions and its expected targets, goals and outcomes. The GEF, as the Convention's financial mechanism, can provide financing for the control, and where feasible, the reduction of mercury from such point sources.

UNDP, in line with the Convention's requirements and GEF guidelines, can provide technical assistance to countries and national partners to:

- Control and reduce the release of mercury and unintentionally produced POPs (UPOPs) from industrial/metallurgical production and recycling processes.
- Introduce control strategies and technological options for atmospheric mercury emissions from coal-fired industrial boilers.
- Reduce mercury emissions from waste incineration facilities.

- Coal combustion, cement production and primary metal production are responsible for 24%, 9% and 2% of mercury emissions respectively.

Source: 2013 UNEP Global Mercury Assessment



COAL-FIRED POWER PLANTS ARE A MAJOR SOURCE OF MERCURY EMISSIONS.

Phase-out of Mercury Devices in the Health Sector

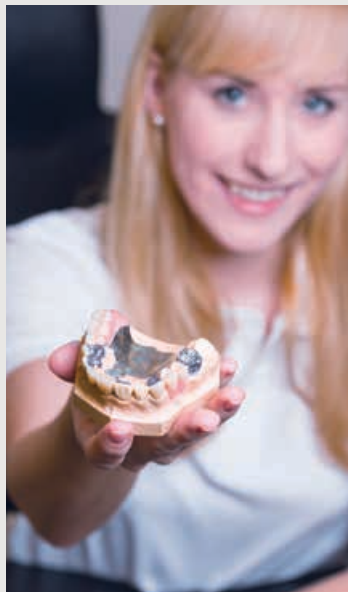
- For almost all mercury-containing medical devices, cost-effective alternatives are available.
- UNDP supports 18 countries through 9 projects in phasing-out mercury usage in this sector.

In healthcare settings, mercury may be released from thermometers, blood pressure and gastrointestinal devices, and other mercury-containing products such as dental amalgam, fixatives, preservatives, lab chemicals, cleaning products, etc.

When mercury-containing products break, liquid elemental mercury quickly evaporates to a gas, exposing healthcare workers or patients to potentially highly toxic levels. If products that contain mercury are discarded into the waste stream or incinerated, this results in environmental contamination.

When the Minamata Convention comes into force, it will require countries to phase-out the manufacture, import and export of mercury-containing thermometers and blood pressure devices by 2020, as well as introduce measures to reduce the use of dental amalgam. Fortunately, there are safe and cost-effective non-mercury alternatives for nearly all uses of mercury in health care.

UNDP, with GEF grants and often in partnership with WHO and the international NGO, Healthcare Without Harm (HCWH), has been supporting 18 countries in phasing-out mercury-containing medical devices, introducing cost-effective alternatives (following staff preference studies), improving the management of mercury-containing wastes, preparing awareness raising materials on the dangers of mercury, preparing guidance materials, and conducting training on the use of alternatives and on mercury spill management. This has helped protect the health of thousands who work in the healthcare sector (the majority of whom are women) as well as the protection of the environment from toxic mercury releases.



EXAMPLES OF MERCURY USE IN THE HEALTHCARE SECTOR. FROM LEFT TO RIGHT: MERCURY SPHYGMOMANOMETER, DENTAL AMALGAM AND A FEVER THERMOMETER.

CASE STUDY

Argentina, India, Latvia, Lebanon, Philippines, Senegal and Viet Nam: Global Medical Waste Project (2008 – 2015)

Seven countries participated in this global project, whose main objective was to demonstrate and promote best practices and techniques to reduce releases of Unintentional Persistent Organic Pollutants (UPOPs) from the incineration of healthcare waste and mercury releases from the breakage of medical devices. With financial support from the GEF, it was implemented by UNDP in partnership with WHO and the NGO, Health Care Without Harm (HCWH).

Mercury-related project activities supported almost 30 model hospitals in adopting best practices for mercury management (e.g. spill management, storage of phased-out devices), introducing mercury-free devices, training healthcare staff on their use, and evaluating acceptability and efficacy.

At the national level, the project helped draft national phase-out standards, national guidelines on mercury management and on calibration and maintenance of non-mercury containing devices. At the international level, the project contributed to the development of WHO and HCWH guidance materials on mercury waste management and phase-out as well as technical specifications for non-mercury containing devices. Training modules, awareness-raising materials and videos were prepared and adopted by national educational institutions. Intergovernmental Negotiating Committee (INC) meetings for the mercury treaty also benefitted from mercury-related data generated under the project.

- The project helped 30 hospitals in 7 countries become mercury-free.
- The project's mercury component resulted in a release reduction of 112 kg mercury per year (equal to 448 kg mercury per year for the entire project duration).
- In Latvia, the project also collected an additional 120 kg of mercury waste as well as 1.3 tonnes of other chemical wastes from 32 institutions.



NURSES FROM VARIOUS HOSPITALS IN THE PHILIPPINES SUPPORTED THE LAUNCH OF THE "MERCURY-FREE HEALTH CARE 2010" CAMPAIGN ORGANIZED BY HEALTH CARE WITHOUT HARM (HCWH) ASIA. PHOTO BY FAYE FERRER/HCWH ASIA.

Lifecycle Management of Products Containing Mercury

UNDP supports countries and national stakeholders in introducing a lifecycle approach for the management of mercury and mercury-containing products. UNDP assists countries to phase-out mercury-containing products, for which cost-effective alternatives exist, to help them meet future Minamata Convention commitments. UNDP also supports countries in improving the management of used mercury-containing products, including storage as well as waste management and treatment, according to the relevant guidelines developed under the Basel Convention.

Products that could be a part of such lifecycle management practices include fluorescent light tubes, energy-efficient light bulbs, dental amalgam, thermometers, sphygmomanometers, etc. When they break or enter the waste stream, so does the mercury they contain. Without proper lifecycle management, storage and disposal practices in place, mercury will be released into the environment.

Reducing mercury in products has been put forth as the most effective means to decrease atmospheric emissions of mercury from waste streams. For most mercury-containing products, cost-effective mercury-free or low content mercury alternatives exist. Further emission reductions can be achieved with appropriate waste handling and recycling practices in order to recover the mercury before it is released into the environment.



LIFECYCLE MANAGEMENT: PRODUCTION OF FLUORESCENT LAMPS IN VIET NAM. PHOTO BY ANIL SOOKDEO.

CASE STUDY

Uruguay: Environmentally Sound Lifecycle Management of Mercury-Containing Products and their Wastes (2014 – 2017)

This GEF-supported UNDP project implements a lifecycle approach to manage and phase-out/phase-down a number of mercury-containing products and wastes, including lighting products, dental amalgam, and mercury-containing medical devices, while also addressing issues of product collection, decontamination technologies and processes and final mercury storage. Awareness-raising and communication campaigns will be conducted to promote the collection and decontamination of used lamps as well as mercury-containing medical devices.

Project activities include:

- Strengthening the regulatory and policy framework for the sound lifecycle management of mercury-containing products and their wastes.
- Phasing-out and phasing down mercury-containing devices and products by introducing mercury-free alternatives or products with a lower mercury content.
- Improving national (regulatory, policy, technical, financial, etc.) capacity to make lifecycle management of mercury-containing products technically and economically feasible.

The project, launched in late 2014, anticipates eliminating at least 330 kg of mercury as a direct outcome of the project's implementation. In addition, changed practices are expected to result in sustained mercury reductions of approximately 72.5 kg of mercury per year.



LIFECYCLE MANAGEMENT: DESTRUCTION OF FLUORESCENT LAMPS.

Reducing the Use of Mercury in Artisanal and Small-Scale Gold Mining (ASGM)

- Annual emissions from ASGM are estimated at 727 tonnes (35% of total anthropogenic emissions).

Source: 2013 UNEP Global Mercury Assessment

- UNDP has supported ASGM-related activities in: **Africa:** Burkina Faso, Tanzania, Zimbabwe. **Latin America:** Brazil, Bolivia, Honduras, Peru, Suriname, Guyana. **Asia:** Cambodia, Indonesia, Lao PDR. **Arab States:** Sudan.

Around 15 million people in 55 countries - including 3 million women and children - participate in ASGM-related activities. Another 100 million people are indirectly dependent on ASGM for their livelihoods. Mercury is used in gold mining to extract gold from ore by forming an “amalgam”. The amalgam is then heated, evaporating the mercury from the mixture, leaving only the gold. This method is followed by ASGM communities worldwide since it is fairly simple and often cheaper than alternative methods.

Mercury use in ASGM accounts for around 35% of mercury emissions and is the largest source of mercury pollution to air and water. In particular, mercury vapors near amalgam-burning sites can be alarmingly high, affecting not only the health of ASGM workers but also those in communities surrounding the processing centers.

UNDP, often with GEF grants, but also with funds from bilateral partners, supports countries to implement projects which:

- Prepare ASGM National Action Plans (NAPs), as well as mercury baseline assessments focusing on ASGM sites.
- Support the formalization of the ASGM sector through the creation of cooperatives.
- Establish financial lending arrangements/revolving funds for the purchase of mercury-free processing equipment by legalized miners/cooperatives.
- Increase the capacity of mining communities to shorten the gold supply chain; apply BAT/BEP approaches; and adopt socially and environmentally sound mining practices.



ARTISANAL MINERS USE MERCURY TO SEPARATE GOLD FROM SEDIMENT IN OMAI, ESSEQUIBO, GUYANA.
PHOTO BY CHIKA OHASHI, UNDP GUYANA.

CASE STUDY

Brazil, Indonesia, Lao PDR, Sudan, Tanzania and Zimbabwe: Reducing Mercury Pollution from ASGM under the Global Mercury Project (2002 – 2007)

Prior to its designation as the financial mechanism for the Minamata Convention, the GEF through UNDP and UNIDO made an important investment in reducing mercury pollution from ASGM under the Global Mercury Project (GMP).

The project was financed from the International Waters focal area, reflecting the transboundary nature of mercury pollution in major shared watercourses such as the Amazon, Nile and Mekong Rivers, and involved six countries with extensive ASGM activity representing over 2 million miners: Brazil, Indonesia, Lao PDR, Sudan, Tanzania, and Zimbabwe. The project assessed the extent of pollution from current activities, introduced cleaner ASGM technologies which minimized or eliminated mercury releases, and developed capacity and regulatory mechanisms enabling the sector to minimize negative environmental impacts. These actions improved incomes of miners, enhancing development of the mineral sector and hence the economy.

Comprehensive reviews of mining legislation were conducted in each country, leading to the preparation of new mining legislation in Indonesia, Lao PDR, Sudan and Tanzania. The project developed Transportable Demonstration Units (TDU) to enable transfer of mercury recovery and recycling technologies to sites in each country. The capacity of over 100 trainers was enhanced, over 30,000 miners were trained in more sustainable ASGM practices, and over 25,000 community members were sensitized on health and environmental issues in the sector.



TAILINGS FROM A SMALL-SCALE GOLD MINE LOCATED IN THE TARKWA DISTRICT IN GHANA. PHOTO BY DAVID BUCK.



GOLD MINERS AZIZ AND ABDULAY IN SHINYANGA, TANZANIA. PHOTO BY AFRICA924/SHUTTERSTOCK.COM

CASE STUDY

Honduras: Environmentally Sound Management of Mercury and Mercury-Containing Products and their Wastes in ASGM and Healthcare (2015 – 2019)

The project's strategy is based on three broad goals:

- Repair the currently inefficient gold supply chain.
- Leverage new formal revenues to finance technical and training services.
- Regionalize the supply chain and link producers to markets for green(er) or more ethical gold.

This newly-approved GEF-supported UNDP project will help Honduras achieve the objectives of the Minamata Convention and develop the required capacity to implement provisions of the Convention when it enters into force. It will support the creation of an enabling environment by improving the regulatory and policy framework for the environmentally sound management of mercury, mercury-containing products and their wastes. It will also develop technical capacity for risk assessments, inventories and monitoring of mercury releases, use of mercury-free devices in healthcare, use of socially and environmentally sound artisanal gold mining practices, creation and operation of interim storage for mercury-containing wastes, and lifecycle management of mercury (including spill cleanup, collection, transport, etc.). Finally, awareness-raising activities on the dangers of exposure to mercury will be conducted.

The project's combined efforts are expected to result in mercury reductions of approximately 1,000 kg per year. These releases would otherwise be added to the "global pool" of mercury, putting environmental and human health at risk everywhere.



DREDGE MINERS ARE RE-WORKING THE TAILINGS OF AN ALLUVIAL MINING OPERATION IN BAJO ANTIOQUIA, COLOMBIA. PHOTO BY PAUL CORDY.

LOOKING FORWARD



UNDP's activities in the area of mercury management will continue to support developing countries and countries with economies in transition prepare for the ratification of the Minamata Convention, meet their future commitments under the Convention and reduce releases of mercury from priority sectors and release sources. This is fully aligned with Outcome 1 of UNDP's 2014-2017 Strategic Plan, whose aim includes developing solutions at national and sub-national level for the sustainable management of chemicals and waste.

UNDP's support to countries will also contribute to achieving the GEF-6 mercury target, which is to reduce 1,000 tonnes of mercury by 2018. As illustrated in this brochure, throughout GEF-6, UNDP will provide support to countries and national stakeholders to reduce mercury through the following types of programmes:

- Conducting MIA activities and ASGM National Action Plans (NAPs). MIAs include mercury inventories and assessments of the legal and regulatory frameworks as well as institutional and technical capacity needs.
- Reducing emissions of mercury and mercury compounds to the atmosphere from point sources (e.g. coal-fired industrial boilers, incinerators, smelting and roasting processes used in the production/recycling of non-ferrous metals).
- Phasing out mercury-containing devices in the healthcare sector (e.g. thermometers, blood pressure meters, dental amalgam, etc.).
- Lifecycle management of mercury, mercury-containing products and wastes (including treatment and storage).
- Reducing/eliminating the use of mercury in ASGM, and minimizing mercury releases to the environment from mining and processing.

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