

Mercury (Hg) is a toxic, volatile, persistent global pollutant which has the potential characteristics of undergoing methylation; and subsequent bioaccumulation in the food chain. Natural sources including volcanoes, forest fires, weathering of mercury-bearing rocks, degassing of the earth and growth of plants release Hg in the environment. Anthropogenic processes such as coal burning, cement production, artisanal and small-scale gold mining, energy generation processes, waste incineration, cremation and dentistry contribute to Hg in the environment. Re-emissions from past deposits add to Hg contamination in the environment.

Hg pathways in the environment

Hg travels long distances and persists in the environment, circulating between the air, water, soil, sediments, animals and plants. Dry and wet deposition of atmospheric Hg occurs onto the geosphere and the hydrosphere; which are regarded as the key repositories of Hg in the environment. Hg can also undergo microbial methylation, leading to the production of highly toxic monomethyl Hg in the water column, surface sediments and wetlands. UNEP reported that anthropogenic sources of Hg emission in 2015 to the atmosphere was estimated to be 2220 tonnes; with an increased total atmospheric Hg concentration about 450% above natural levels.

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Figure 3: Updated global Hg budget. (Ref: GMA 2018)

Mercury In The Environment: A Review.

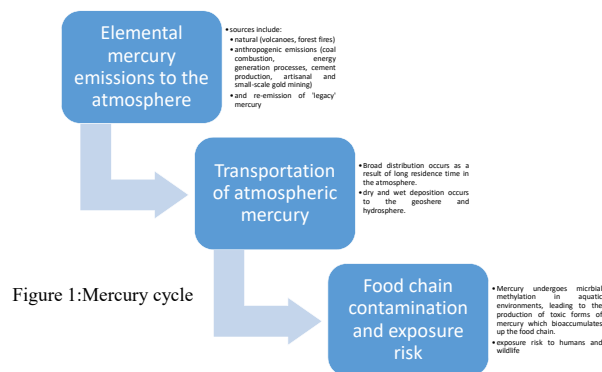


Figure 1: Mercury cycle

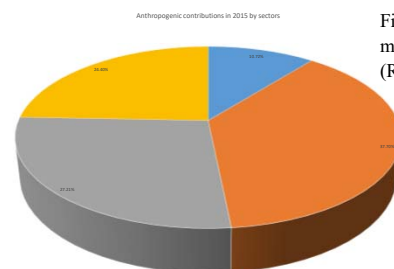
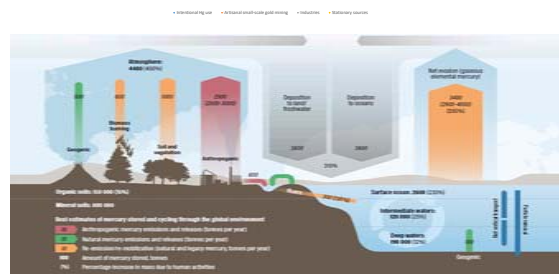


Figure2: Sectoral mercury emissions (Ref: GMA 2018)



A Global concern

Hg has been recognized by the World Health Organization (WHO) as a chemical of global concern due to its long-range atmospheric transportation, persistence and bioaccumulation in the environment and its deleterious effects on human and ecosystem health. Through bioaccumulation within the food chains, human exposure results; which leads to related toxic effects to immune, digestive and nervous systems as well as kidneys, eyes, lungs, and skin. Hg is the only metal in the periodic table to have its own convention, referred to as the Minamata Convention; to which 128 countries are signatories to. The Convention targets to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.

Sustainable Development Goals (SDGs)

UNDP targets to achieve sustainable, inclusive and resilient human development through its SDGs. SDG14 “highlights on the conservation and sustainable use of the oceans, seas and marine resources for sustainable development”. The UNDP assists countries to decrease the use and release of Hg from various land-based activities, prevents Hg entering water sources, and reduce the build-up of Hg in the food chain whilst UNEP targets to protect human health and the global environment from the release of Hg and its compounds by minimizing global anthropogenic Hg releases to air, water and land. SDG2, SDG3, SDG10 and SDG11 talk about Hg pollution in relation to food security, mitigation, subsistence economy and sustainability through waste minimization respectively.

Reference: UN Environment (2019) Global Mercury Assessment 2018. UN Environment Programme, Chemicals and Health Branch Geneva, Switzerland.

UNEP (2020) Minamata convention on mercury marks three years of protecting human health and the environment. <https://www.unenvironment.org/news-and-stories/story/minamata-convention-mercury-marks-three-years-protecting-human-health-and-the-environment>.

WHO (2019) Mercury and health. WHO. <https://www.who.int/news-room/fact-sheets/detail/mercury-and-health>.