

Status of Mercury use in Sri Lanka and Possibilities for networking with APMMN

Senarath Mahinda Werahra
Assistant Director
State Ministry of Environment

Minamata convention and Sri Lanka

- Sri Lanka has become a party to the Minamata convention and also willing to ratify the convention in 2016
- Mercury is used in Sri Lanka in following sectors.
 - Indigenous medicine
 - Western medicine including dentistry
 - Education
 - Jewellery
 - Power (Energy generation and energy saving)

Indigenous medicine

Indigenous medicine

Consists of 2 words RASA + SHASTRA

Meaning of Rasa is Mercury. Shastra means study.

Aim of Rasa Shastra

Any human beings have three ambitions.

To live and to live longer

To earn money for living.

Attain salvation after death.

- Deha Veda - to attain longevity, health and vigour by using drugs containing mercury.
- Loha Veda - to earn money by converting non precious metals into precious ones with the help of Mercury and Mercurial products.

Western medicine including dentistry

Western medicine including dentistry

Promotion

Curative Sector

Preventive Sector

Rehabilitation Services

Usage of Mercury containing Equipment in western medicine

- Currently no literature is available regarding the amount of mercury used in the healthcare sector in Sri Lanka
- In Sri Lanka, thermometers are procured by the Medical Suppliers Division and sphygmomanometers are procured by the Bio Medical Engineering Division of Ministry of Health, only for the hospitals in the government sector.

Continue-

- Medical Suppliers Division has procured 8250 mercury thermometers in 2008
- Bio Medical Engineering Division has procured around 500 Mercury sphygmomanometers in 2010.
- Bio Medical Engineering Division procures around 100kg of elemental mercury each year for repairing of sphygmomanometers

Continue-

- These values are a gross underestimation of the amount of thermometers used in the government hospitals as majority of the thermometers used in wards are either donations from the patients or local purchase.
- Ministry of Health institutions are the main users of Sphygmomanometers and thermometers.
- If Ministry of health purchase non mercury instruments for its institutions automatically private sector also will follow suit.
- This objective can be achieved if ear marked fund available.

Education sector

Mercury is used in,

Thermometers

Barometers

As a laboratory reagent in chemistry

Quantity of mercury distributed among Schools for five years (2008-2012)

1000 thermometers

1000 Barometers

116kg of Mercury in metal form

Jewellery

- No gold mining is practiced in Sri Lanka as the availability of gold is not reaching the limit required to practice it
- But small scale jewellers use Mercury to separate gold from dust
- Total number of goldsmith in Sri Lanka is 200,000
- If annual amount of Mercury used per goldsmith is 10g, the annual amount of Mercury used in this sector is 2000kg
- The amount use and effects especially indoor air pollution due to Mercury is not known

Power (Energy generation and energy saving)

- CFL bulbs are popular as energy saving method
- CFL bulbs are added to ordinary waste stream in most cases
- One company is collecting the CFL bulbs sold by them
- Mercury emission from the Coal power plant is not available (Coal are imported from Australia)

Other finding related to Hg in Sri Lanka

- The highest value of mercury content in fresh water fish is observed in liver of Tilapia sps in Kaudulla reservoir which is 1.4568 mg/Kg (Assessment of Heavy Metals by B.K.K.K. Jinadasa and E.M.R.K.B. Edirisinghe)
- *Mercury content of Urine in people engaged in gold recovery is 0.514 where the average value is 0.073 for other people (source Rathnayake and Arawgod,1987)*

Continued-

- Hg was recorded from Mannar intertidal sediments and Muthurajawela Peat by Senaratne & Dissanayake (1989)

Mannar intertidal sediments

Hg is available in HNO₃ leachates of Mn-Fe-oxide and hydrates and organic matter

Max concentration 8 ppm

• Muthurajawela Peat

Hg is bound to Mn- and Fe-oxides hydrates and -sulfides of basal peaty clays.

Max concentration 95 ppm

- Thermometer Breakage in Sri Lanka

One private hospital 350 thermometers a year

One children hospital 300 thermometers a year

One Rural hospital 150 thermometers a year

(Source; Center for Environmental justice)

Annual accumulation of Mercury from CFL bulb

- Total No of Houses surveyed = 90
- Total No of CFL Bulbs = 464
- Average usage of CFL bulb = $464/90$
- = 5
- Annual Mercury accumulation in Sri Lanka due to CFLs

- Total number of electricity consumer - 4501301
- Standard error - 10 %
- Other types of electricity consumer - $4501301 \times 10 / 100$ 45013.01 (Source; Center for Environmental Justice)
- Total number of electricity consumer - 4546314
- Annual usage of CFL per house - 5
- Total amount of Annual CFL bulb - 4546314×5 - 22731570
- Mercury content of a bulb - 4 mg
- Total Mercury accumulation - 22731570×4 mg

- - 90926280 mg - 90.92 Kg

Continued-

- In 2008 this level of Mercury detected in sediments collected from Negombo lagoon was between 0.6- 0.75ppm (Source; Indrajith, H A P, Pathiratne K A S & Pathirathne A, 'Heavy metal levels in two selected fish species from Negombo estuary, Sri Lanka: relationship with body size'. *Sri Lanka J. Aquat. Sci.* 13, 2008, pp. 63-81).

Total amount of raw Mercury import to Sri Lanka during 2005-2011

- Importation of Mercury during 2005-2011 is 4870Kg.
- The importation is mostly from India, Spain and Saudi Arabia

Source: Centre of Environmental Justice

Mercury monitoring

- Measurement of Mercury is not carried out in the national air quality monitoring programmes

Measurement of Mercury level in air and rain is important due to

- Minamata convention (consider the affects of Mercury)
- Coal power generation (we have only one plant)
- But Trans-boundary movements of air pollution
- Sri Lanka has to pay more attention for the marine resources in future

Possibilities for networking

- Already established air quality monitoring centres are available island wide
- Already established meteorological centres are available island wide
- The related human resources is available to be used in Mercury monitoring after a training

Continued--

- State Ministry of Environment function as the focal point for Minamata convention, Basel convention and Stockholm convention
- BRS technical committee as well as National committee on BRS conventions are already functioning and it deals with the issues related to Minamata convention too.

Continued--

- The Ministry is in the stage of receiving funds from GEF on ratification of the mercury convention (Mercury inventory is identified as an activity of the project)
- The steering committee on Minamata convention is already established

Continued-

- Both Marine Environmental Pollution Prevention Authority (MEPA) and Central Environmental Authority are comes under the State Ministry of Environment can be the leading agencies on monitoring Mercury emission in air and monitoring the level of Mercury in marine environment
- State Ministry of Environment is closely working with other government institutes in environmental management activities. Therefore, establishment of Mercury monitoring network is feasible

Continue--

- State ministry of Environment has good relationships with the researchers in the Universities
- Universities are located throughout the country

References

- The presentation refers the contents of the presentation made by following officers at inception workshop on Minamata convention
- Dr. Mrs. S.K.M.K. Herapathdeniya, Institute of Indigenous Medicine, University of Colombo
- Dr. T.B.A.Jayalal, Director/Environmental and Occupational Health, Ministry of Health
- Mr. Vipulasena Pathiraja, Director Science, Ministry of Education
- Mr. Nalaka, Geological Surveys and Mines Bureau
- Thilak Dharmarathne, Director General, Gem and Jewellery Research and training Institute
- Mr. Hemantha Vithanage Centre for Environmental justice

Thank you