



Report of the One-Day Online Consultative Workshop on Industrial Use and Handling of Mercury in India

Strengthening Implementation of the Minamata Convention

Organized by

CEERA, NLSIU

In collaboration with

Indian Institute of Technology, Hyderabad

&

**Ministry of Environment, Forest and Climate
Change**

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Prof. Dr. Sairam Bhat
Coordinator, CEERA
Professor of Law, NLSIU

ABOUT THE WORKSHOP

**CONSULTATIVE-WORKSHOP ON
INDUSTRIAL USE AND HANDLING
OF MERCURY IN INDIA**

**STRENGTHENING IMPLEMENTATION OF
THE MINAMATA CONVENTION**

**MAY 21, 2021
2:30 P.M.**

ONE DAY CONSULTATIVE WORKSHOP

TERRENCE THOMPSON
Consultant, World Health Organisation

Dr. GRIHA BHARAT
Founder Director, Me-Gamma Consultants

Dr. CLAUDIA TIRI-HAVE
Senior Policy Coordination Officer, Secretariat of the Minamata Convention on Mercury, United Nations Environment Programme

ANAND KESHAV SINGH SALIA
National Professional Officer (India), World Health Organisation

Dr. ERK KOMOLO
Partner, Dr. Komolo & Partners Advocates, Nairobi

MR. SUNDARESAN
Senior Advocate, Chennai

Prof. (Dr.) JASKI SHRESH
Associate Professor, IIT Hyderabad

Prof. (Dr.) SARRAM BHAT
Professor of Law, NLSIU

Prof. (Dr.) N. K. RAMESH
Professor of Law, NLSIU

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The One-Day Online Consultative Workshop was organised under the aegis of the Three-Year Project granted by the Ministry of Environment, Forests and Climate Change, Government of India, titled “*Collaborative Engagement for Research, Training and Development in Handling of Chemical and Hazardous Waste*”. The broad objectives of this project inter alia include, providing advisory to the Ministry on matters connected to the Conference of Parties under various Multilateral Environmental Agreements, to which the country is a party including the Minamata Convention.

The Minamata Convention on Mercury is a multilateral environmental agreement that addresses specific human activities which contribute to widespread mercury pollution. It was agreed at the fifth session of the Intergovernmental Negotiating Committee on mercury in Geneva, Switzerland and was adopted in the year 2013. The Convention was framed with the objective of protecting human health and the environment from the adverse effects of mercury. The Convention entered into force in 2017 with 128 countries as signatories to it. Currently, 131 countries are parties to the Convention. Under the Convention, State Parties have the duty to ban new mercury mines, undertake measures to phase-out of existing ones, phase out and phase down mercury use in a number of products and processes, control measures on emissions to air and on releases to land and water, and the regulation of the informal sector of artisanal



and small-scale gold mining. The Convention also addresses interim storage of mercury and its disposal once it becomes waste, sites contaminated by mercury as well as health issues.

India is a party to the Convention and ratified the same in 2018. As a part of its obligations, India is required to take steps to reduce, and where feasible eliminate, the use of mercury and mercury compounds. Currently, the legal framework governing the use, handling and disposal of mercury in India is in a very nascent stage. Although the plethora of environment related laws provide a few solutions in terms of regulating the use of mercury, there are several challenges that persist. In light of this, the Workshop was organized by CEERA, NLSIU to deliberate on and build awareness about the laws governing the use and handling of mercury in India and to study the implications of the continued use of mercury on health and the environment.

The Workshop was aimed at fulfilling one of the mandates given by the Ministry, which includes conducting stakeholder consultations and capacity building programmes to build awareness about the different laws and policies that govern the chemical and hazardous waste sector. Towards understanding the challenges faced by industrial participants and stakeholders in handling of mercury, the Workshop sought to identify the sectoral challenges associated with the use, handling and disposal of mercury.

The Workshop deliberated on the following thematic areas:

- Regulatory Challenges to Storage, Use and Disposal of Mercury
- Precautionary Measures for Industrial Hazards in handling of Mercury
- Occupational Health & Concerns
- Contamination of Food, Drugs, Soil and Environment
- Use of Mercury & Product Liability
- Packaging and Labelling Requirement

There were a total of 56 registered participants at the workshop. The participants included industry professionals, legal professionals, students and academicians from environmental sciences and agricultural universities. This report gives a detailed description of the proceedings of the workshop

ABOUT THE INSTITUTIONS

ABOUT NLSIU

The National Law School of India University, the Nation's premier law university, came into existence through a Notification under the National Law School of India University Act (Karnataka Act 22 of 1986). It signified the culmination of efforts by the Judiciary, the Bar Council of India, the Karnataka Bar Council, the Bangalore University and the Government of Karnataka to reform legal education and to establish a centre of excellence for legal education and research in India. The Law School has undertaken many research projects funded by the UGC, the Government of India, the Government of Karnataka, the Department of Women and Child Development, UN agencies, the World Bank, HIVOS, Department of Justice etc.



The Projects have served to strengthen research and teaching at the Law School. The National Law School of India University since its inception has taken proactive steps in organizing conferences, seminars, workshops, refresher courses and certificate courses to update academicians, law teachers, students, industry personnel in different subject areas.

ABOUT CEERA



Centre for Environmental Law Education, Research and Advocacy (CEERA), established in 1997 is a benefactor of the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of Karnataka, the Bar and the Bench in India and abroad. Building an environmental law database, effectively networking among all stakeholders, building up an environmental law community and policy research in the area of environment are CEERA's main objectives.

To achieve the aforesaid, CEERA has incessantly and successfully been able to build functional and professional linkages with government agencies and non-governmental organisations in India, the South Asian Region and at International levels. CEERA, has been partnering with the Central Pollution Control Board in organising Training Programmes for the officers of various State Pollution Control Boards and other industry professionals for over eight (8) years. One of the first in India, to successfully be granted a World Bank project and thereafter being a steady choice for the Ministry of Environment Forest and Climate Change, CEERA has been



entrusted with research projects and workshops to impart training to Forest Officers, Revenue Officers, Officers of the Central Pollution Control Board and also of the Government of Karnataka. CEERA is proud to have completed a two-year Research Project granted by the United Nations Development Programme (UNDP) under the Global Environment Facility (GEF), and as one of the deliverables, organised, convened and conducted over twenty workshops at Institutions of national repute creating awareness on the Biodiversity Law and Access and Benefit Sharing (ABS) in less than 2 years. Two research publications on the scanty research area of biodiversity laws were also the outcome of this project.

CEERA has several publications in the area of environmental law, the law and public policy along with Newsletters, CEERA March of the Environmental Law, NLSIU's first e-Journal – Journal on Environmental Law, Policy and Development and manages three websites viz., www.nlsenlaw.org, wherein the law and policy on Environment is regularly updated, and www.nlsabs.com, a dedicated portal wherein the law and policy on Biodiversity Access and Benefit Sharing is updated periodically. All our publications are duly updated on our online portal www.nlspub.ac.in, which is open for subscription to all readers.



SUMMARY OF PROCEEDINGS

SESSION I

SETTING THE AGENDA: GENESIS OF REGULATION OF THE INDUSTRIAL AND HAZARDOUS USE OF MERCURY: A PERSPECTIVE OF THE MINAMATA CONVENTION

The online workshop on “Industrial Use and Handling of Mercury” commenced with Ms. Madhubanti Sadhya, a Teaching Associate at CEERA, who gave a brief introduction about Centre’s activities, initiatives and research projects.



This was followed by the keynote address by **Prof. (Dr.) M.K. Ramesh**, Professor of Law, NLSIU. Dr Ramesh started the workshop by cherishing the 25 years long collaboration of NLSIU with MoEF&CC and the World Bank. The purpose of the collaboration was capacity building and policy intervention. The Collaboration of the NLSIU with UNEP is thirteen years old and was intended to deliberate over capacity building in developing world. When the Centre was established in 1997, it was meant to act as a finishing school for environmental law professionals in India.

Dr. Ramesh observed that Mercury Management in India needs robust policy and legal framework for implementation besides the capacity building exercises. He emphasised the need to evolve a toolkit comprising of capacity enhancement, a clearer policy frame and a crisp legislative frame with unambiguous preventive, precautionary, proactive and punitive aspects. The existing laws have not been able to accommodate the upcoming challenges in the field of mercury management. Dr. Ramesh focussed on the need for an Indian model of mercury management which could be an inspiration for the world. This model will be effective in implementation, which can create an industrial readiness for

compliance with laws, educate people about the hazardous effect of mercury, has a robust policy and legal framework and bring some clarity in this regard.



The introductory session was then taken over by **Prof. Asif Qureshi** and **Prof. Sairam Bhat** who gave an overview of the project under the aegis of the MOEF&CC. This project is a multi-disciplinary one which cuts across different streams.

One of the biggest challenges is that the cause – effect relation is not apparent. Therefore, the policy makers should try to understand the scientific aspect of managing mercury while forming policies.

Mercury is a niche area of hazardous waste. Challenge of mercury starts from its source and then other aspects like export, import and integrating the handling of mercury with SDG comes into the picture. The focal area is the public health. Mercury also contaminates the marine ecosystem and affects the food chain. Occupational hazard for workers is neglected and is a critical area. Hence an environmental sound management of mercury is needed.

Professor Bhat highlighted that India has less than four years to fulfill its obligation under the Minamata Convention and goals set by international community. The industries are looking at alternatives for environmentally sound management of mercury. And that depends to a large extent on research and innovation. This workshop aims at an industry-stakeholder integration as a collective pledge to irradiate the use of mercury.

Professor Bhat emphasized the need for a national action plan with deadlines to implement them and integrate the relevant departments and ministries for curbing the use of mercury. The workshop looks for ideas for such nation action plan.

SESSION 2

ENVIRONMENTAL CYCLE OF MERCURY, RESEARCH FINDINGS, AND ISSUES

Prof. Asif Qureshi, Associate Professor, IIT Hyderabad



Dr. Qureshi discussed about environmental cycle of mercury, research findings and issues. Mercury is called Hydrargyrum and is also called quicksilver as it is a shimmery and shiny liquid. Then Prof. Qureshi discussed how liquid mercury was found in the chamber of the Chinese Emperor Qin in Xi'an also known as the 'Terracotta Army Emperor'. The emperor used to send his men in search of dose

for immortality and they returned with mercury and made him drink that. This made the mausoleum a hotspot of mercury.

He then pointed towards the adverse health effects of mercury including its neurological effects, organ failure and cardiovascular effects. Mercury has an adverse neurological effect as the body is not able to differentiate between the two chemicals cysteine and methionine. If mercury is taken by pregnant mothers, then it can affect the growth of the foetus. Infants who are exposed to mercury experience stunted growth. Pregnant mothers are exposed to methyl mercury when they consume fish containing mercury. Prenatal exposure affects the weight, height and metabolic activities of the child.

The difference between ethyl mercury and methyl mercury was also discussed and how methyl mercury is more toxic. Prof. Qureshi then explained the whole cycle of how mercury enters into the soil, water and then bioaccumulates in the fish. From the fish it enters human body, thus contaminating the food chain. When mercury is released in the environment through industrial activities it stays in the environment for a very long time and is capable of a very long-range transmission.

Classifying the sources of mercury, Prof. Qureshi distinguished them into natural and anthropogenic sources. Amongst the anthropogenic sources, release of mercury from coal fired power plants, iron and steel plants, waste burning and smelting of other metals are often regarded as "unintentional sources" as they are not using mercury, but mercury is part of the impurity. Prof. Qureshi prefers to call them

“unintentional use, but not unintentional release” as everyone is aware that ultimately mercury is being released. Besides these there are the “intentional sources” where mercury is added intentionally to the products like mercury thermometers, CFL lamps, switches, several medical devices, PVC pipes etc.

The most common species of mercury emitted in the environment are Hg(o) and Hg (II) and once this mercury is released in the environment it mixes with everything. Once emitted in the environment Hg(o) and Hg(II) get interconverted from one form to another and is exchanged with water. Then it is deposited in water and from there it is transferred in the soil and from soil to vegetation. The mercury accumulated is toxic and stays long as it stays in the year for months, in water for hundred years and in soil for thousand years. Mercury emitted in one country could mix in the whole hemisphere and in six months it can lead to inter-hemispherical contamination and can become an inter-continental issue. A small portion of this mercury is converted into methyl mercury which is the organic form of mercury and is very toxic in nature.

Prof. Qureshi then pointed out that the annual emission of mercury is consistently increasing as it is fossil fuel driven. So, if the use of fossil fuels is reduced then it will lead to a significant drop in the release of mercury. Fighting climate change which aims to reduce the use of fossil fuel can also reduce the emission of mercury. On a map of global emissions of mercury which Prof. Qureshi put up, India could be seen as a major emitter. The map of global emission of mercury from river to ocean, the map showing the level of mercury in the biota and finally a bar-graph of emission projection in India presented a concerning picture.

Prof. Qureshi then moved on to a study that revealed concentration of mercury in human hair, classified according to profession. Amongst the various professions classified as businessman, students, people in white collar jobs, housewives, dental students, goldsmiths and fishermen, mercury was found in high levels amongst fishermen and goldsmiths. Concentrations in businessmen and dental students were also found to be higher than the rest.

Mercury is also extensively used in skin-care products as according to a study conducted in 12 countries it was found that sixty percent mercury was present in 158 skin-care products as mercury is a skin whitening agent. People tend to use these products because of lack of awareness. Prof. Qureshi spoke about the need for fixing accountability for usage of mercury in these products. For this, a robust system is needed and also skin-care products should be labeled for consumer awareness. A survey conducted in Kerala found that mercury was used in famous fairness creams above the healthy limit. So, a healthy limit to the use of mercury in fairness creams should be strictly prescribed and implemented as big companies

producing fairness creams deliberately use mercury due to its skin-whitening qualities.

Mercury is majorly used in dental amalgamation in both official and unofficial way. To prevent the unofficial use, only registered users should be allowed to use mercury for amalgamation. Prof. Qureshi suggested that a system based on lines of KYC policy should be developed to separate official users from unofficial users.

The reckless industrial usage of mercury is a matter of concern. He discussed the mercury contamination due to Kodaikanal factory of Hindustan Unilever. This factory was owned by Hindustan Unilever where mercury was not properly disposed of, leading to contamination of the soil. 366 kg of mercury was found in the soil, water and affected the adjacent areas of the factory. To prevent such events in the future he suggested that accountability of Industries should be fixed for Industries. Prof. Qureshi pointed out that a mass balance analysis for past and future based use is necessary. He then recommended that the cosmetic products should be properly labeled. Once again highlighting the earlier point Prof. Qureshi said that the use of mercury by industries may be unintentional but the emission is intentional. So, accountability and liability should be fixed.

Dr. Claudia ten Have, Senior Policy Coordination Officer, Secretariat of the Minamata Convention on Mercury, United Nations Environment Programme



Dr. Claudia ten Have commenced her presentation by stressing on the need for the Minamata Convention. The Convention looks at the release of mercury by human action. Then through a picture she explained the cycle of mercury and how it enters our body. Mercury has become a global priority and not only a priority of where it is used. She then through maps showed the types

of areas where mercury is emitted, from what sort of activities, the global distribution of mercury and how it moves.

The other topic for the presentation was 'how does the Minamata Convention set the international agenda for mercury'. Dr. Claudia started her presentation by saying that mercury is not a problem when it is in its natural state and that the

reliance on mercury is gradually decreasing globally. She then proceeded to provide a better understanding of the Convention. The objectives of the Convention are to protect human health and environment from anthropogenic releases of mercury and mercury compounds. The logic behind the convention is to scale down the supply of mercury to make it less available and on the other hand to also make it less necessary in our economy and society. She gave an example of decreasing use of chlor-alkali since 2005 and is still decreasing. There is a trend to use less mercury in products which earlier was using mercury in relatively larger amounts.

Dr. Claudia then proceeded to discuss the various control measures and enabling provisions under the Minamata Convention. Articles 3,4,5,7,8,9,10,11,12 talk about the entire cycle of mercury. The four major areas that the convention covers are the stocks, trade, products and processes. Regarding stocks she mentioned that parties should be aware what stocks they currently have i.e., how much mercury is there in a country as stocks, that could be held by mercury traders, mines, governmental facilities, industrial facilities and recycling facilities. When the Convention speaks of recycling mercury waste, it does not mean reusing it. The intention is not to use it again unlike other environmental waste. For India she said that it is important to see the stocks held by Indian business houses. The chlor-alkali is banned in India but what are the steps taken to decommission it and the methods to recycle mercury needs to be followed.

Regarding trade, Dr. Claudia said that the parties should be using mercury only from allowable sources. Trade with a party or a non-party to the convention should include a certification that mercury has come from allowable sources. She then shared a picture to explain the trade flow of mercury in India from world and how the flow has been decreasing. Trade of mercury is done with full knowledge of them being hazardous therefore certification is required for parties that trade mercury from allowable sources.

Regarding products, she said that it is used in batteries, switches and cosmetics. She pointed out at the data reflecting mercury in dental amalgams in India, noting that it is extremely high. Such high figures are hardly congruent with the government's efforts and sensitization is necessary towards this end. has registered an exemption from the export, import and manufacture of these products till 2025 and is making efforts to do so. Regarding processes she said that party should make appropriate measures to reduce the usage or change or phase out the use of mercury in manufacturing process in a particular sector.

Dr. Claudia added that the other objectives of the convention include protection of human health and environment from anthropogenic emissions and release of mercury and mercury compounds. It also tries to prevent the direct mining of

mercury, the import and export of mercury and seeks to advance the safe storage and disposal.

India does not directly mine mercury but emits it as a by-product. In her presentation she showed that Chlor-alkali production is extremely small in India and is banned in India since 2016 but the use of mercury in dental amalgam is quite high in India. Therefore, the use of mercury in dental amalgamation should be checked. Further, the awareness about the use of mercury should be especially increased in regards to the cosmetic products. She mentioned that life-cycle approach of mercury is reducing. The supply and demand and excess use of mercury should be managed. Mercury is widely used in thermometers and other medical apparatus, but an increase in the use of alternatives to such devices is seen.

She again returned to the Minamata Convention saying that it is a young convention and should focus on capacity building. Commenting on the awareness about the hazardous use of mercury she said that even before the convention was in place a global partnership of various stakeholder existed ten years before the Minamata Convention. She ended that mercury waste should be properly disposed and for that, parties to the convention should formulate their own course of action.

SESSION 3

INDUSTRIAL USE AND HANDLING OF MERCURY REGULATORY AND POLICY PERSPECTIVE ON THROUGH MERCURY IN INDIA

Session three of the workshop had two speakers who highlighted the legislative framework for the governance and regulation of mercury in India. Mr. ARL Sundaresan discussed the handling and use of mercury from an industrial perspective. The second speaker, Dr. Girija Bharat, Founder Director, Mu Gamma Consultants, discussed the regulatory and policy perspective on use of Mercury in India.

Mr. ARL Sundaresan, Senior Advocate, Chennai



Mr. Sundaresan began by emphasising the need to phase out the industrial use mercury in an elaborate and insightful manner. This segment began with the acknowledgement of the fact that mercury is a hazardous substance. Therefore, its use should be phased out. Mr. Sundaresan appreciated the industry for eradicating the use of mercury as a substance in

several products. He further noted that industries such as the medical industry that relied heavily on use of mercury for medicals instruments or devices such as thermometers, dental amalgams have successfully reduced its use through alternatives. He focused on the industry's efforts to eradicate the use of mercury through use of digital thermometers. To summarize, he acknowledged the fact that industries have tried to reduce the use of mercury in every possible manner.

The use of mercury cannot be completely eradicated across different industries. There is a need for a comprehensive law that covers all aspects of mercury such as import, movement from place to place, storage, use and disposal. From that perspective, India has several legislations that can pave the way for the use and handling of mercury. The Indian constitution plays a critical role in this. Article 19(1)(g) of the constitution confers the right to carry on any business or profession. However, this right is subject to reasonable restricts under article 19(6). This means that the state has the authority to frame laws restricting or regulating any business and that the freedom provided under article 19(1)(g) cannot be used to justify the continuation an occupation that involves the use of mercury. Article 21 of the Indian Constitution guarantees right to life and it encompasses a good and risk-free, healthy environment. In addition, this article confers the government with the power to uphold the right to life and thereby regulate any activities that threaten the same. Apart from that, Articles 47 and 48A of the Directive Principles of State Policy provides for duty of the state to raise the level of nutrition, standard of living and public health and protect the environment respectively. Together, these four articles are sufficient enough to empower the government to make adequate laws.

The Environment (Protection) Act, 1986 confers the state with power to make rules and regulations. The act lays down the penalty for any violation of the act. Even government officials who indulge in activity involving the use of mercury and in violation of the rules and regulation can be prosecuted under the act. Therefore, there is no distinction between private companies and government officials in terms of their liability/ penalty under the act. Similarly, Water (Prevention and Control of Pollution Control) Act, Air (Prevention & Control of Pollution) Act have been framed. The Hazardous Waste Handling Rules are elaborate and comprehensive in the sense that it covers the use of mercury from the beginning till its safe disposal. Regulation 4 of the rules lay down the responsibilities of the occupier for management of hazardous and other waste. These responsibilities include- prevention, minimization, reuse, recycling, recovery, utilization including co processing and safe disposal. Therefore, the rule makers have taken a complete view regarding the identification of mercury as a hazardous substance and its subsequent safeguards that should be taken before storing, handling of the same by the workers, prevention of exposure to hazardous

substances. Remedies, capability of recycling, disposal are all governed by licenses and the record and registration needs to be maintained with regards to the storage of hazardous substance. Mr. Sundaresan emphasised that there were adequate laws and rules in regard to mercury in India, however there was the need to enforce the same by the appropriate agencies much more effectively. Additionally, the industry needs to follow these rules strictly. If the two things are done, the use of mercury can be phased out.

Emphasising on the fact that no other cases of acute mercury contamination has been reported in the country after the Kodaikanal incident, Mr. Sundaresan said that mercury is being properly handled in India to a larger extent.

Speaking from an industry perspective Mr. Sundaresan focussed upon the need for alternatives. He spoke about taking into account of factors such as amount of invested capital, amount of loans advanced to industry by financial institutions, number of employed workers and number of persons who are directly or indirectly involved in the process. The use of mercury as a substance cannot be abruptly stopped- it has to be phased out and several departments need to coordinate for the same. He proposed that the industry should be given due time to stop the use of mercury and give them a time limit of 5 to 10 years. He observed that the use of mercury can be eradicated through substitutes of mercury, tax benefits being provided by financial institutions, through extending the time limit for repayment, paying the workers and subsidies being given by the government. Such measures will encourage industry to eradicate the use of mercury and prevent them from going back to use the same. Therefore, a two-pronged approach should to be adopted for phasing out the use of mercury- the industry and the government along with NGOs need to work together for the same.

Dr. Girija Bharat, Founder Director, Mu Gamma Consultants



Dr. Girija Bharat started the session by discussing the Minamata Convention and its alignment with current policies in India. She noted that prior to ratification of the Minamata Convention, India had already adopted the Stockholm Convention, Rotterdam Convention and Basel

Convention. However, the scope of these conventions is much larger as compared to the Minamata convention that focuses solely on mercury.

She highlighted the fact India is the second largest emitter of mercury with 144.7 tonnes of mercury emission per year. While India has come a long way, more needs to be done by multiple stakeholders such as the government, citizens, NGOs and academic institutions. She reiterated the fact that despite the enactment of regulations pertaining to use of mercury, these are not implemented properly. Therefore, our problem lies with respect the compliance with these existing regulations and we need to be cognizant of the same. She further explained that while pursuing her post doctorate at university, she was exposed to the concept of how science was influencing policy work. She highlighted the minor changes in western nations with regards to the awareness regarding use of mercury by giving an example of how water or fish containing mercury wasn't allowed to be consumed by women and others and this advisory was often followed. She further noted her surprise at science informing policy decisions in such a manner as the same is not seen in India.

After she returned to India, she participated in mapping of Ganga River and found out that there was presence of heavy metal in the river. More specifically, mercury was present in a very high amount in Allahabad and exceeded the permissible limit. Groundwater which is source of drinking water was also mapped and the presence of mercury emerged as a public health issue.

For another study, food samples collected from the cities of Delhi and Dehradun has been analysed for presence of pesticides and heavy metals. It was found that presence of mercury in some of the samples were high.

Against this background, the role played by Minamata Convention in influencing the policy decisions was highlighted. The success of Minamata Convention depends on developing countries such as China and India that are the largest contributors of global mercury supply, trade and emissions. The rapid economic development in the recent times has resulted in high emissions. Therefore, the implementation of Minamata Convention can be made successful by supporting scientific research, compliance of adopted and existing legislations with the convention, particularly the reduction of mercury use and export import. The development of implementation strategies and programmes were also discussed.

Dr. Bharat also highlighted the importance of scientific and political coherence between developing and developed countries and observed that these factors are ignored in developing countries and countries that are in a period of economic transition. This is because of the lack of financial bandwidth to switch over to safer alternatives. Though it has been done in some cases, more can be done in this regard.

Dr. Bharat emphasised the need to ponder upon a few things like how can the alternatives of mercury be made more affordable? How can mercury be phased out in dental amalgamations? Thereafter, she acknowledged that India's regulations are aligned to the Minamata Convention. For example, article 3 pertaining to mercury supply and trade lays down obligations for prohibition of mercury mining activity and the same isn't carried out in India. It was observed that several Indian legislations are aligned to the Minamata Convention such as the Mines Act, 1952; The Mines and Mineral Development Act of 1957; The Factories Act of 1948, The Manufacture, Storage and Import of Hazardous Chemical Rules 1989, 1994 and 2000; The Hazardous and Other Waste Management Handling and Transport Movement 2016, The Foreign Trade, Development and Regulation Act of 1992 and the Customs Act of 1962. However, it was recognised that compliance with these obligations continues to remain a challenge.

Article 4 of the Minamata Convention deals with mercury added products. It confers obligations with regards to the prohibition of primary mercury activities. India does not mine mercury and legislations such as the Factories Act of 1940 and Foreign, Trade, Development and Regulation Act of 1992 are aligned to article 4 of the Minamata Convention. Thereafter, Dr. Bharat highlighted that there are gaps with regards to the obligations contained in Article 5 of the Minamata Convention which pertains to manufacturing and use of mercury compounds. The obligation under this is to prohibit and restrict the use of mercury and its compound in the manufacturing process listed in part I and Part II of the annexure to Minamata Convention. The Manufacture, Storage and Import of Hazardous Chemical Rules and the Drugs and Cosmetics Act and Rules are aligned to article 5 of the Minamata Convention. Further, obligations under article 7 of the Minamata convention were discussed that provide for taking steps to reduce and eliminate the use of mercury and its compounds. The related Indian regulations include Mines Act, 1952 and Mines and Mineral Development Act of 1957. Article 8 of the Minamata Convention confers obligations with respect to control and reduce emission of mercury and its compounds in atmosphere. However, inspite of these numerous regulation, compliance remains a challenge

The major source of mercury emission can be reduced by 50 percent. This can be achieved through setting particular goals for phasing out the use of mercury and would lead to implementation of the Minamata Convention. Towards the end, some recommendations were put forth. These were-

1. National Strategic Mercury Monitoring Network needs to be established – It was noted that India already has national air quality monitoring programme which consists of 731 operation stations in 312 cities but mercury doesn't fall within the purview of regularly monitored pollutants. This already exiting knowledge-based implementation should be utilized by use for regulating the

emission and use of mercury. The availability of mercury emission inventory would ultimately contribute towards development of India's National Action Plan on Mercury.

2. Management of Mercury related Contaminated Waste Sites- Mercury waste is generated on a large scale especially in the unorganised sector and this takes place in a very rudimentary manner. Therefore, it poses a huge risk to the people who are in charge of handling of such waste. This can be addressed by formalizing the sector and resorting to safe recycling mechanisms.
3. Mercury Inventory and Monitoring- It was noted that there are several areas that require systematic and long-term actions. Awareness needs to be raised among the community and nationwide systematic mercury monitoring action is required. In addition, well planned environment and human monitoring of mercury is also crucial.

Dr. Bharat concluded by stressing on the fact that management of mercury in a step wise manner can lead to sound management towards sustainable development goals. Mercury management in India requires a strong management framework that integrates management efforts with development plans & sustainable business practices.

SESSION 4

HEALTH, SAFETY AND WELL-BEING: A POLICY PERSPECTIVE

Mr. Manjeet Singh Saluja, National Professional Officer, WHO



Mr. Manjeet Saluja, National Professional Officer, WHO started the session by discussing the four sections that would be covered by both him and Mr. Terrance.

These are - the background information, role of health authorities, the strategic planning and the WHO support for implementation in the area. He reiterated the fact that mercury is recognized a chemical of global concern and that it falls among the list of top ten chemicals of public health concern. He stated the long-term health impacts that mercury can cause on the immune system, nervous system and associated risks due as a result of environmental or occupational exposure and even through use of consumer goods such as skin lightening products.

Thereafter, he moved to discuss the sources of mercury in India and South Asia. It was mentioned that India does not geologically extract mercury on its own and therefore, relies on import of mercury for its commercial demand. However, India continues to be the second largest emitter in terms of mercury pollution. He highlighted the fact that while sectors such as the medical sector has reduced the use of mercury in medical devices such as the thermometer, the problem of mercury use continues to persist. This is because mercury continues to be used in a number of health care facilities and devices. The example of mercury containing dental amalgams was provided. Further, it was noted that many dental institutions continue to involve the use of mercury containing instruments while teaching dental students. This leads to large scale mercury consumption. Additionally, the other issue identified by Mr. Saluja was with regards to the lack of comprehensive sector wise mercury consumption data in India. Therefore, he stressed on the need to further deliberate upon this aspect.

Mr. Saluja discussed the implementation of Minamata Convention in the Indian context. He referred to the convention as one of the few multilateral environmental agreements that focuses on protection of human health and India being one of the 136 parties to the convention since June 2018. He acknowledged the fact that India has implemented several environmental legislations that focus on various pollutants that are considered under different above mentioned MEAs such as the Rotterdam and Basel Convention. The Indian environmental regulations have had a broad scope and the implementation has focused on addressing the environmental pollution problem collectively instead of focusing on a single specific pollutant such as mercury.

The Minamata Convention's implementation in India will be in line with the sustainable development objectives that seek to protect human health and environment from the anthropogenic emissions of mercury and mercury compounds. The ratification of the convention has urged enterprises to switch to alternatives of mercury and use non mercury technology in the manufacturing process. Mr. Saluja emphasised how this would lead to research and development and innovation resulting in self-reliance in country. Therefore, the Minamata Convention provides the country with an opportunity to become more innovative and self-reliant.

Towards the end, he discussed WHO's role in highlighting the aspects of use of mercury and its relation with health and environment through introduction of resolution 67.II. He stressed upon the need for states to work in tandem with each other for implementation of the Minamata Convention.

Mr. Terrence Thompson, Consultant, WHO

Health-related Articles: Obligatory or Voluntary?

World Health Organization

- Obligatory with a fixed time frame for implementation**
 - Art. 4, para. 1, Annex A – Phase out mercury-added products
 - Art. 7 – Artisanal and small-scale gold mining (ASGM)
- Obligatory without a fixed time frame for implementation**
 - Art. 4, para. 3, Annex A – Phase down dental amalgam
 - Art. 11 – Mercury waste
 - Art. 12 – Contaminated sites
 - Art. 17 – Information exchange
 - Art. 18 – Public information, awareness and education
 - Art. 19 – Research, development and monitoring
- Voluntary**
 - Article 16 – Health aspects

We will look at a few of these articles more closely in the following slides.

Source: Strategic Planning for Implementation of the Health-related Articles of the Minamata Convention on Mercury (WHO, 2013)

Mr. Terrence Thompson

Mr. Thompson took forward the session by discussing the role played by health authorities in the implementation of the Minamata Convention on Mercury. He referred to the WHO guidelines document on strategic planning for implementation of the health-related articles. He noted that all articles of the convention seek to safeguard public health and environment as that is the primary objective of the convention. However, the WHO has identified some articles that provide for the health authorities to play a leading role in their implementation. The Minamata Convention requires the involvement of many sectors and Ministry of Environment of state parties. However, certain articles are more health oriented. These are either obligatory or voluntary with or without a fixed time limit. Article 4 Para 1 Annex A (Phasing out of mercury added products) and Article 7 (Artisanal and small-scale gold mining) are obligatory with a fixed time limit for implementation whereas some other provisions like Article 4 Para 3 Annex A, 11, 12, 17, 18, 19 contain obligatory commitments, but with no time limit. Article 16 is completely voluntary.

The question then arises before the health authorities is if they are to be implemented without a fixed time limit, then which article should be given priority over the other or whether such articles should be implemented in a parallel manner. He further noted that with regards to the implementation of voluntary articles, mobilization of resources become difficult. He noted that health authorities need to give priority to obligatory articles with a fixed time limit. Mr.

Thompson discussed Article 4 that deals with mercury added products, in greater details. He observed the relevance of this article for health authorities which need to be concerned particularly with mercury containing thermometers, medical instruments, dental amalgams and skin lightening products. Many state parties have regulatory control over these products and need to phase out the use of mercury in these products. The Minamata Convention does not require that mercury containing devices are completely retired. However, these uses of mercury in these devices would be reduced and non-mercury alternatives would be used. With regards to the phasing out of dental amalgam, the Minamata Convention provides nine measures out of which states should implement at least two measures. The first one relates to promoting oral health while the second one relates to use of alternatives of dental amalgams in dental schools. Therefore, the health authorities can focus on simple measures.

Thereafter, Article 2 pertaining to management of mercury waste in an environmentally sound manner was discussed. This management needs to be done in accordance with the guidelines of Basel Convention. This included healthcare waste including mercury. Therefore, the health authorities need to pay attention to healthcare waste management. While many countries have rules regulations for the same, the major challenges are with respect to implementation of such rules and regulations. System for transport of health care waste and their disposal needs to be there and there needs to be inter sector collaboration for mercury waste disposal. Parties are encouraged to take following measures with respect to health aspects- to promote the development and implementation of strategies and programmes, to identify populations at risk as that is a challenge, strengthen occupational health challenges for workers exposed to mercury compounds and strengthen healthcare services for prevention treatment and care of affected persons and finally strengthen institutional capacity and professional capacity to prevent mercury exposure and treat affected persons.

Towards the end of the session, the discussion focused on WHO Guidance on strategic planning for implementation of health-related articles of the Minamata Convention on Mercury.

SESSION 5

MERCURY CONTAMINATION OF ENVIRONMENT LAW AND POLICY IN AFRICA

Dr. Erick Komolo, Partner at Dr. Komolo & Advocates, Nairobi

Dr. Komolo was then invited to continue the session with the discussion on the Minamata Convention in Africa. He began with introducing his role as the National Policy Advisor on the Minamata Initial Assessment in Kenya between 2016 and 2017, hired by the country's Ministry of Environment and Natural Resources. About a couple of years ago, he was asked by the East Africa Law Society to work on a policy brief for use of mercury in gold mining activities in the region, intended for the countries of East Africa, which are about five in number.



Dr. Erick mentioned that when developed the concept of Initial Assessment, there only two signatories to the Minamata Convention, and 128 state parties – unsurprisingly 36 of them are from Africa, representing the largest group of states party to the Convention. That is the case with most international conventions for Africa, because of the way states are divided in Africa and owing to its colonial history. While Kenya is still to ratify it, Guyana, where Dr. Erick previously worked, was one of the first countries to ratify the Minamata Convention.

In most African countries, Dr. Erick mentioned, currently activities relating to “Minamata Initial Assessment” are in full swing, which involves surveying mercury use and existing mercury discharge in the various African Countries. Thereafter, referring to the PPT being presented, Dr. Erick went on to talk about the various issues he thought needed to be addressed as part of the Assessment. The first was the focus on finding where the national mercury inventories are located. Moving on, a major issue that plagues the region is the menace of Mercury Smuggling, especially in the areas of gold mining, near the Kenya-Tanzania border. In addition, waste management becomes a major issue owing to the import of mercury for dental amalgamation practices in urban centres, and the question of disposing such wastes. This further leads us to evaluate and assess, Dr. Erick stressed, on the question of the existing legal and policy measures that deal on the

subject matter. Dr. Erick recounted how his experience working with the government officials in the two countries of Kenya and Guyana brought forth the obvious knowledge and capacity gaps, for example matters relating to technical capacity relevant to the convention. Furthermore, most of the process there is donor-driven, making it very difficult for the officials to know and to have to wait for the next steps to be taken. Dr. Erick then explained how this is particularly endemic to countries like Kenya due to being dependent on their donors for such technical processes. He then went on to describe the greater incidence of institutional turf wars in the region – official work departments from the environment department, those from the chemical department and those from the law and policy department, owing to which most inputs from policy experts like him are relegated to such turfs and entanglements between various ministries such as health, chemical and environment. This again, according to Dr. Erick, is enhanced owing to the driving force for the various institutions being to procure donations from the donor rather than focusing on the subject matter and the Convention. Dr. Erick also elaborated on the often undermined yet important role of the non-state actors, especially the miners' association, and the Caribbean indigenous groups who are very powerful as far control of land and resources are concerned. Another important yet hugely undermined role is that of criminal networks, especially on two fronts – mercury smuggling in the Caribbean, mostly coming from China and parts of Europe.

After having pointed out the issues in the context of the Minamata Initial Assessment in the region, Dr. Erick went on to share his observations and reflections pertaining to the Convention and its implementation post-ratification, especially in the context of Kenya where he was more intricately engaged. He was particularly concerned with the issue of lack of informed stakeholders – the initial struggle was to identify who they are. Dr. Erick stressed on the importance of an informed category of people, the stakeholders, who are well-versed with the specific concerns of the region with respect to Mercury Waste Management, for the implementation of the Minamata Convention. In the case of Africa, these would be groups like the student association groups, study circles and then at the second level, various government departments and institutions. He also mentioned with the example of Kenya, that recommendations should pertain to nationalising and institutionalizing mercury waste and inventory management instead of abrupt interventions that talk about completing targets by 2025. Further, since many countries still struggle with violence in the region, he stressed upon the need to engage in strategic engagement to disrupt the various trans-boundary mercury smuggling networks, since without that national waste management institutions will also be futile. He gave the example of Kenya, for which the weakest link remains the Somalian border. A part of disruption of these networks is also disrupting the various sex trafficking networks and rackets too, which is the

human rights perspective, also necessitating the need of sensitisation and adequate legal action against the perpetrators.

Dr. Erick then highlighted the need for engagement of the academia, mentioning he had not met a single person or policy expert specialising in the subject matter of the Minamata Convention in the African region. He proceeded to flag the issue of official corruption involved in regulatory processes, which end up frustrating all efforts directed at mercury management and institutions. Thereafter, Dr. Erick made reference to his work with the Kenyan government describing the challenge of assessing the adequacy of current laws, and the existing policy measures. Therefore, the moot question in the context of the implementation of the Minamata Convention, especially in countries like Kenya with some of the most comprehensive laws to deal with environmental concerns, is whether the existing laws are adequate to take into account the concerns of the Minamata Convention or if there is the need of new legal framework for the same. Dr. Erick opined that from his understanding, the existing legal framework was quite adequate and that the only focus should be on extensive implementation and enforcement of the relevant measures.

Underlying all these observations, Dr. Erick clarified, was the requirement of deliberate international cooperation so as to ensure that the goodwill around Minamata Convention, since Africa poses to be the danger of being the weakest link owing to various smuggling networks. Dr. Erick then concluded his talk by citing the example of the resurgent waves of COVID-19, and that lessons from countries like India can serve as reminders to nations in Africa to prepare for timely interventions to prevent the same happening there. It is with such level of preparedness, he emphasised, that the African nations to cooperatively work in an international framework for the success of the Minamata Convention.

SESSION 6

LEGAL, POLICY AND INTERNATIONAL FRAMEWORK ON INDUSTRIAL USE AND HANDLING OF MERCURY: A SECTORAL ANALYSIS

Cosmetics Industry



Ms. Madhubanti Sadhya, Teaching Associate at NLSIU commenced the session with a focus on the Cosmetics Industry. The purpose of this sectoral analysis was to give the participants a preliminary understanding of the extent of use of Mercury in cosmetic products, and the relevant legislations, rules and guidelines. Ms. Madhubanti highlighted that various studies and statistics bear testimony that the concentration of mercury in cosmetic products such as body lotions, blemish balms, skin lightening/fairness creams, bleaches, exceeds the permissible limits. For instance, a study conducted in Kerala revealed that 41.4% of the sample population consisting of college going students used products containing high mercury concentration. Similarly, according to a survey conducted by Centre for Science and Environment (CSE), out of 32 samples of cosmetic products, 14 products contained mercury levels between 0.97-1.97 ppm. Ms. Madhubanti also informed the participants that leading cosmetic companies like L'Oréal, Olay and Ponds are engaged in manufacturing of products containing excessive amount of mercury. Before proceeding further, she opined that the excessive use of mercury containing cosmetics was also a consequence of the obsession of the Indian society with lighter skin.

While discussing the regulations governing the use of mercury in the cosmetics sector, Ms. Madhubanti noted that there is a comprehensive legal framework in place. She delineated the main legislations concerning mercury in cosmetics, namely, the Drugs and Cosmetics Act, 1940, Drugs and Cosmetics Rules, 1945 and the Cosmetics Rules, 2020.

The speaker mentioned that two most pertinent rules of the Drugs and Cosmetics Rules, 1945, are Rule 135A, and Rules 145D, which prohibit the import and

manufacture of mercury containing cosmetic products in India. The speaker also referred to Rule 39(5) of the Cosmetics Rules, 2020, which harmonizes the Indian framework with the Minamata Convention, by stipulating that eye-cosmetics must contain less than 0.07% mercury, whereas finished products with unintentional mercury must contain less than 1 PPM mercury. The speaker also elaborated upon Rule 9 which empowers the Inspectors constituted under the Drugs and Cosmetics Act, 1940, to inspect various facilities and manufacturing units, and if convinced that the Rules are being violated, are authorized to initiate prosecution.

Moving further, she spoke about the labelling and packaging standard for cosmetic products. She underlined that as per Schedule 9 of the new Cosmetics Rules, 2020, all cosmetics have to comply with the Bureau of Indian Standards' (BIS) packaging standards. Besides these requirements, manufacturers are also required to mention specifications, usage requirement, information regarding licensing and manufacturers etc. Moreover, since 2019, the Central Government has mandated the Central Drugs Standard Control Organization (CDSCO) to check all cosmetic products getting manufactured or imported to India.

Lastly, coming to the Minamata Convention, Ms. Madhubanti stated that cosmetic products are mentioned under Annex 1A, and India is obligated to phaseout mercury containing cosmetics by 2025. She concluded her presentation by recommending certain suggestions. The speaker believes that to reduce and ultimately eliminate the use mercury containing cosmetics, the Government should either introduce tax incentives for safer alternatives or impose higher taxes on consumer products that have mercury above the permissible limit, implement stricter labelling standards, apprise and educate enforcement and investigating officials of their duties, and make the people aware of the harmful effects of mercury containing cosmetics.

Indian Electrical Equipment Sector

INDIAN ELECTRICAL EQUIPMENT SECTOR

Overview of Legal and Regulatory Policy in India in reference to Mercury

- The Workmen's Compensation Act, 1923
- The Factories Act, 1948
- The Environment Protection Act, 1986 and The Environment Protection Rules 1986
- The Public Liability Insurance Act, 1991
- The Foreign Trade (Development and Regulation) Act, 1992
- The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
- The Hazardous Waste(Management, Handling and Transboundary Movement) Rules,2008
- Guideline for Environmentally Sound Management of E-waste 2008
- The E-waste (Management and Handling)Rules,2018
- Guidelines by Central Pollution Control Board of India, State Pollution Control Boards or pollution control Committees
- Bureau of Indian Standards

Extempore Justice
November 24th 9:47 AM
We share all your feedback, views, notes, queries

The next leg of the session was commenced by **Mr. Rohith Kamath**, Legal Consultant, CEERA, who emphasized on the Indian Electrical Equipment Sector. He began with enlisting the various legislations and guidelines related to mercury use in industries, namely:

- The Workmen's Compensation Act, 1923
- The Factories Act. 1948
- The Environment (Protection) Act, 1986 and the Environment (Protection) Rules, 1986
- The Public Liability Insurance Act, 1991
- The Foreign Trade (Development and Regulation) Act, 1992
- The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
- The Hazardous Waste Management, Handling and Transboundary Movement Rules, 2008
- Guidelines for Environmentally Sound Management of E-waste, 2008
- The E-waste (Management and Handling) Rules, 2018
- Guidelines by the Central Pollution Control Board of India, State Pollution Control Board, or pollution control Committees
- Bureau of India Standards

Mr. Rohith mentioned that the most prominent is the E-waste (Management and Handling) Rules, 2016, amended in 2018 as the industry produced lot of electrical waste. It was also added that the Rules also concerned itself with the manufacture of electrical equipment, and introduces the concept of Extended Producer Responsibility (EPR). EPR imposes an obligation on the manufacturers of electrical equipment containing mercury.

Before proceeding further, Mr. Rohith, informed the participants of the significance of mercury use in the electrical sector. Mercury due to various characteristics such as good conductor, liquid at room temperature, etc., is a major reason why it is utilized as an essential element in various electrical equipment like switches, CFL bulbs.

He proceeded by stating that owing to the fact that the Indian Electrical Sector accounts to 3.64% of the FDI, any abrupt or strict regulation imposed will have serious ramifications for investments, employment and the economy as a whole. The speaker also highlighted that 96% of turnover and investments comes from

the members of the Indian Electrical Equipment Manufacturers Association (IEEMA). Thus, the proposed legal framework should be investment friendly.

With respect to regulation at the end of manufacturing, the speaker referred to Rule 16 of the E-waste (Management and Handling) Rules, 2016. Accordingly, while there is a ban on the use of mercury, such ban is not absolute. Items mentioned under Schedule 2, containing 2.5-40 mg of mercury are excluded from the aspects of EPR.

On a concluding note, Mr. Rohith threw light on the fact that in an endeavor to reach the 2025 deadline, there will be ramification from both the industrial as well as the regulatory perspective.

Mercury Mining and Minamata Convention

India's Position and Obligations

- World's second largest Mercury Emitter.
- No Primary Mercury Mining in India. Relies completely on import.
- ASGM sector though significant is very little as compared to other sectors such as coal burning, industrial sector, medical sector etc.
- Legal Framework: Mines Act, 1952 & Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act, 1957).
- Need for development of National Action Plan and its integration with SDGs.

Mr. Vikas Gahlot, Teaching Associate at NLSIU, proceeded with the third part of the session which dealt with mercury mining. He mentioned that the Minamata Convention deals with mercury mining in two parts. First being primary mercury mining, which means mining done for the purpose of extraction of mercury. Article 3 of the Minamata Convention prohibits new mining operations after the coming into force of the Convention. With regard to the existing mining operations, the same are to be carried out only for additional 15 years, and in compliance with Article 4, 5, and 7 of the Minamata Convention.

The second type of mining concerns the Artisanal and Small-scale Gold Mining (ASGM) sector, which is dealt in Article 7 of the Minamata Convention. The speaker informed that the goal of the ASGM sector is to reduce and completely eliminate mercury from the sector. However, if the ASGM is a significant sector, then such country is required to introduce a National Action Plan for complying with the provisions of the Minamata Convention.

Mr. Vikas appraised the participants of the fact that despite an absence of primary mercury mining operations in India, it still stands as the world's 2nd largest mercury emitter. The mercury stock of the country is completely relied on imports.

The speaker mentioned that a surprisingly 32% of such imports is not documented. However, it is suspected that this undocumented portion is consumed by the local gold smith and ASGM sector.

Mr. Vikas drawing a comparison, mentioned that the ASGM sector though significant in India, is very small as compared to other sectors such as the Coal Burning Industry, Medical Sector.

Mr. Vikas proceeded to apprise the participants about the legal framework in India pertaining to mining, namely, the Mines Act 1952, and the Mines and Minerals (Development and Regulation) Act, 1957. He also mentioned that the Ministry of Mining and the Indian Bureau of Mining are the two main authorities regulating the mining sector.

He concluded by stating that India requires the development of a National Action Plan and its integration with Sustainable Development Goals.

Mercury in Drugs and Pharmaceuticals



Ms. Geethanjali K.V. began the next part of the session by briefing the participants that mercury had been in ancient times, as an aphrodisiac, rejuvenation tonic, contraceptives.

Proceeding to the context of the modern medicine industry, Ms. Geethanjali informed mercury is used in medicines, medical apparatus/devices, and medical implants. The healthcare sector forms one of the primary sources of mercury pollution and exposure, which generally occurs during medical procedures, improper waste disposal.

She appraised the participants that to be able to manufacture drugs containing mercury in India, the manufacturers must obtain a permit from the licensing authority, Central Drug Standards Control Organization (CDSCO). Mercury is primarily used as a preservative in various medicinal products such as vaccines, antiseptics, disinfectants, eyedrops, herbal medicines, veterinary medicines etc. It is to be found in the concentration 0.01%. According to the FAO-WHO, mercury concentration above 1.76 μ /Kg body weight per week has been deemed to be harmful.

She proceeded to state that mercury in drugs persists in the form of ethyl-mercury, in contrast to methylmercury. Mercury, in the form of thimerosal, is used as a preservative in vaccines. she proceeded to mention that although this compound contains 50% mercury, thimerosal has been considered safer, as it readily gets eliminated from the body in the form of ethyl mercury and thiocyanate, and therefore, does not get accumulated in the body.

In this regard, Ms. Geethanjali mentioned that in 2001, the USA prohibited the use of thimerosal in childhood vaccines as it believed that over a period of time the mercury concentration accumulated in the child's body reaches unsafe levels. However, India has not adopted any such policy.

Proceeding further, Ms. Geethanjali mentioned that it is not convenient to easily replace thimerosal with other alternatives, as it would incur significant costs for the R&D industry, regulatory approval, and therefore, limit the ability to offer affordable vaccines. There is no guarantee that an alternative to thimerosal will produce a vaccine of equal quality, safety and efficacy. The speaker opines that the Government will have to introduce a new regulatory machinery, licensing procedure, pre-clinical and clinical studies.

Besides vaccines, mercury is also an ingredient in antiseptics like mercurochrome. While USA has banned the products, the use continues in India.

Ms. Geethanjali proceeded to mention that mercury is released in the hospitals during burning of medical waste in hospital incinerators, through wastewater and mercury containing wastes in landfills. She highlighted that according to studies, it has been found that averaged sized hospitals in India, release approximately 3Kgs of elemental mercury per annum.

Article 8 of the Minamata Convention provides that the Countries must introduce legislative measures look into alternatives for mercury and to reduce mercury emissions. Following this, the Department of Health and Family Welfare issued a policy on curbing of mercury. In 2003, mercury was included in training programmes on waste management and treatment.

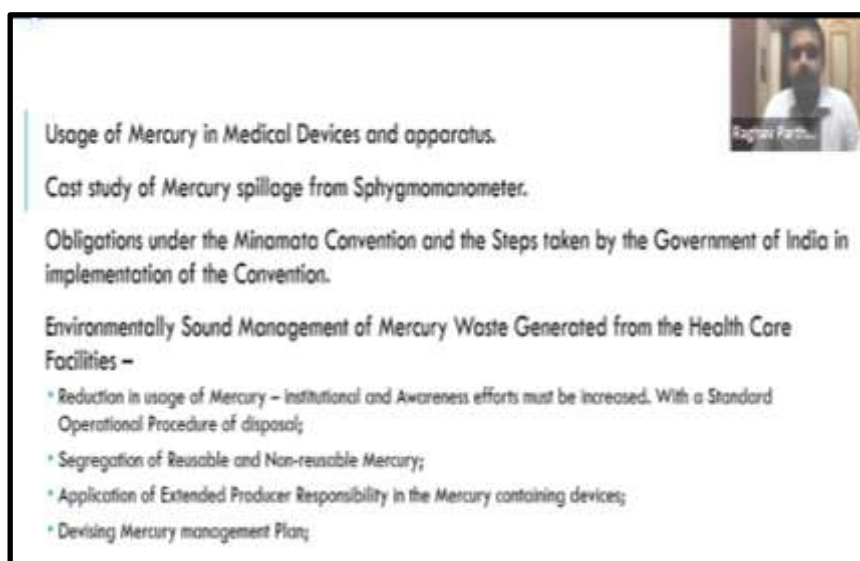
Although the Government introduced the Bio-medical Waste Management Rules, it does not specifically deal with mercury emissions/waste from the healthcare industry.

The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, categorise mercury and mercury containing products as hazardous waste. This legislation conforms with Article 12 of the Minamata Convention.

Ms. Geethanjali proceeded to talk about the Drugs and Cosmetics Act, 1940, which is the primary legislation on drugs. She mentioned that while the Act has banned the use of mercury in cosmetics, such prohibition has not been extended to drugs. However, in relation to drugs and production of drugs, there are rules to ensure proper and safe handling of mercury, mercury compounds so as to train staff and ensure their safety. However, strict penalties and enforcement are yet to be seen.

Ms. Geethanjali concluded by speaking on the action plan. India has adequate laws, regulations to deal with mercury, mercury waste etc. however, these rules are scatters, and therefore, there is a need for a repository where all such information can be accumulated and stored. The Minamata Conventions provides for a solution in this regard, as the Convention obligates the Countries to adopt a National Action Plan to manage mercury use and associated consequences. The speaker stated that if information scattered across various legislations, rules, guidelines is accumulated, then accessing information about mercury will be an easier task for the general public, policy makers identifying gaps in the legal framework. Ms. Geethanjali concluded her presentation by giving an example of the USA, where the government has created a separate webpage to show USA's compliance with the Minamata Convention.

Mercury in Medical Devices



Usage of Mercury in Medical Devices and apparatus.

Cost study of Mercury spillage from Sphygmomanometer.

Obligations under the Minamata Convention and the Steps taken by the Government of India in implementation of the Convention.

Environmentally Sound Management of Mercury Waste Generated from the Health Care Facilities –

- Reduction in usage of Mercury – Institutional and Awareness efforts must be increased. With a Standard Operational Procedure of disposal;
- Segregation of Reusable and Non-reusable Mercury;
- Application of Extended Producer Responsibility in the Mercury containing devices;
- Devising Mercury management Plan;

The presentation on use of mercury in medical devices was given by **Mr. Raghav Parthasarathy**, Teaching Associate at CEERA-NLSIU.

Mr. Raghav began his presentation by apprising the participants with an incident, wherein a 3-year-old Libyan boy had consumed 700-750gm of mercury, which fortunately resulted in minimal harm to the child. This led to the discussion on the differing effects of mercury inhaled versus mercury consumed by an individual. Mercury inhaled or absorbed through other modes, has been found to have drastic impacts of the neuro-system body.

Mercury is used in various devise and apparatus such as thermometers, sphygmomanometers, pyrometers etc. This widespread use of mercury emphasises upon the issue of safe disposal of mercury containing medical devices. At present, such waste is disposed of either by incineration, parallel burning, open burning, pyrolysis, or calcification. However, Mr. Raghav believes that this is not a proper solution.

Proceeding further, Mr. Raghav underlined that the Bio-medical Waste Management Rules excludes mercury spillage from the definition of major accidents. Mercury has to be dealt in a specific law.

He stated that the only legal framework that talks of mercury in the healthcare industry is the 2002 binding Guidelines on Environmentally Sound Management of Mercury Waste Generated from the Health Care Facilities by the CPCB. It lays down proper procedures for sound disposal of mercury waste.

The first and the foremost aspect that the Guidelines specifically mention is the reduction of mercury usage which can be achieved through institutional and awareness efforts, introduction of SOPs for disposal, emphasis on maintaining records if mercury devices etc. The Guidelines also provide that mercury containing waste should be segregated into reusable and non-reusable.

Another important aspect is the application of the EPR, owing to which manufacturers of mercury containing devices can be held responsible for collecting back such devices. Mr. Raghav believes that such an action should be implemented.

The speaker further mentioned that Guidelines devise a proper mercury waste management plan starting from procurement to handling to disposal.

From a perspective of occupational hazards, Mr. Raghav proceeded to speak about the Factories Act. Sec. 41 mentions that mercury concentration in the atmosphere of a factory or industry where workers are engaged in their duties must be within 0.1-0.3 cubic meters. This provision can be interpreted to cover hospitals and employees working there.

Lastly, the recent policy action by the Government, i.e., the National Clean Air Program, 2018, specifically deals with the mitigation and prohibition on use of mercury and other hazardous elements.

Mr. Raghav concluded by underlining that despite India being a growing and developing economy, the Government has introduced policies towards reducing mercury use in the country.

Mercury in the Paint Industry



The last presentation of the Session by **Ms. Lianne D'Souza** focused on use of mercury in the Paint and Coating industry.

The speaker informed that few notable studies conducted primarily in the USA have shown that the vast use and content of mercury in paints is a highly concerning issue. It is a significant source of mercury exposure and poisoning.

Ms. Lianne apprised the participants of a case-study on mercury poisoning of a 4-year-old boy, in Michigan, USA, who suffered from acrodynia due to excessive mercury in the interior-latex paints with which his house was recently painted.

This incident led to discourse on the importance of mercury regulation in paints. However, the speaker states that not much has been deliberated in India upon this issue. There is a lack of awareness which has further led to gaps and loopholes in the legal framework.

Ms. Lianne informed that Article 4 of the Minamata Convention pertains to mercury-added products. Mercury is present in paints in the form of phenylmercuric acetate, and falls within the category of biocide present in the Minamata Convention.

She proceeded to talk about how the Indian Paint industry has been regulated. Although the paint sector emphasises on lead regulation, there is absence of rules, regulations, guidelines by the CPCB and the SPCB, on the permissible limits for mercury use in paints. Mercury does not find place in the list of heavy metals required to be limited or prohibited despite being proved to have catastrophic effects on the human body.

However, the Indian Courts have introduced proactive measures in reference to mercury-containing paints coated idols, in light of various Indian festivals such as Ganesh Chaturthi, Durga Pooja during which the Indian population engages in large-scale idol immersion. The courts have observed that mercury content in paint, has led to indirect consumption of mercury from water resources from activities such as drinking, bathing etc.

Ms. Lianne referred to the case of *T. Ramakrishna Rao v. Principal Secretary of Government of AP*, wherein the Court pointed out the importance of the SPCB to intervene and regulate the immersion of idols coated with paints containing such toxic metals.

In *Ambar Nath Sengupta v. State of West Bengal*, the NGT introduced certain guidelines to regulate mercury containing paints for idol immersion.

Ms. Lianne proceeded to talk about occupational hazards. The Factories Act, 1948, obligates the manufacturer or owner of the factory to give notice in case of any incident of mercury exposure in the premises.

She concluded by stating that although the Government has introduced regulatory mechanism for use and disposal of mercury products, the Paint industry does not fall within the ambit of such framework and is therefore largely, unregulated. She believes that appropriate regulations/legislation should be introduced at the earliest to deal with this issue.

Following this session, the Workshop was brought to an end with Professor Sairam Bhat delivering the vote of thanks to all the resource persons, participants and organizers.
