

STRENGTHENING CAPACITIES FOR MERCURY MANAGEMENT

Report on Study Tour in
Minamata & Kitakyushu

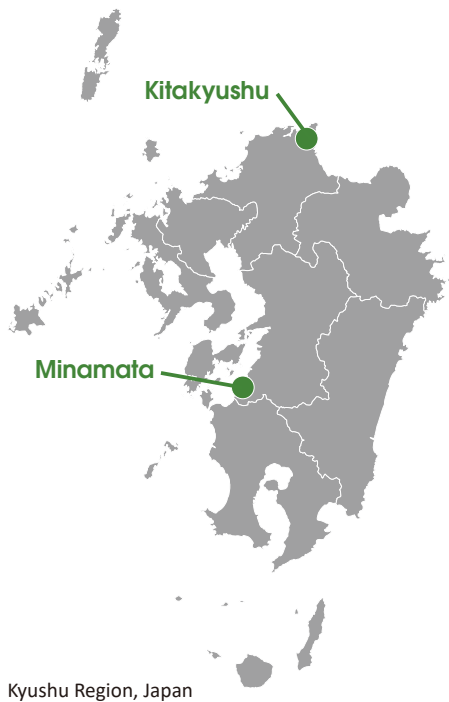
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ORGANISED BY



Background

City Profile



Minamata City, Kumamoto

Minamata City is located at the southern tip of Kumamoto Prefecture of Kyushu. The City had suffered from Minamata disease caused by severe mercury pollution problems in Japan during 1950s and 1960s, but has transformed to an environmentally-friendly and sustainable city.

- Area: 163.29 km²
- Population: 24,501 (April, 2019)



Municipal Museum of Minamata Disease



Beautiful Sea in present Minamata city

Kitakyushu City, Fukuoka

Kitakyushu became known as a hub for manufacturing ever since the early 21st century, however, it suffered heavy environmental pollution in the 1960's. Public-private collaboration to address the problem greatly improved the environment after decades of efforts, and Kitakyushu has now earned international recognition from the United Nations Environment Programme (UNEP) and other organizations for successfully reviving a clean and healthy environment.

- Area: 491.95 km²
- Population: 950,061 (April, 2019)

The Kitakyushu Eco-Town Project, initiated in 1997 by the Japanese government, aims for a zero emission industrial ecosystem through model recycling facilities. One of the recycling plants located in the Eco Town, Japan Recycling Light Technology & System (J Relights), recycles fluorescent tubes that contain mercury.



Sky covered with smoke in 1960s



Recovered sky in the present Kitakyushu

Minamata Convention on Mercury

The Minamata Convention on Mercury was adopted at the conference held in Kumamoto City and Minamata City in October 2013. The convention aims to protect human health and the environment from anthropogenic emissions/releases of mercury and mercury compounds and stipulates appropriate management and reduction of the emissions through the entire lifecycle of mercury including mining, use in products and manufacturing processes, emission to atmosphere, disposal as waste¹. The Minamata

Convention on Mercury entered into force on August 16th 2017 with ratification by over 50 countries and the first meeting of the Conference of the Parties to the Minamata Convention on Mercury (COP1) was held in September 2017 in Geneva, Switzerland. At the COP2, taken place in November 2018 in Geneva, delegates discussed on various technical issues related to implementation of the Convention.

1. Ministry of the Environment <http://www.env.go.jp/en/chemi/mercury/mcm.html>

Ratification & Early Implementation of Minamata Convention by the Philippine Government

According to UNEP's report on Global Mercury Assessment 2013, the greatest proportion of anthropogenic mercury emissions to the atmosphere comes from Asia, which contributes about 50% of the global total, and the majority of Asian emissions come from East and Southeast Asia. Artisanal and Small-scale Gold Mining (ASGM) emissions are the major source of emissions to air from anthropogenic sources.

The national government of the Philippines conducted Minamata Initial Assessment (MIA) with financial and technical assistances of UNEP. The MIA covers an identification of mercury contaminated sites, a development of mercury inventory, policy and institutional framework assessment, and etc. and it was completed in March 2019.

While the Philippines is among the 128 signatory

countries to the Minamata Convention in 2013, the country has yet to ratify the international agreement. The United Nations Industrial Development Organization (UNIDO) and the Swiss Government have been supporting the Philippines government promoting ratification and early implementation of the Minamata Convention on mercury, especially for appropriate management of Mercury-added Products (MAPs) and wastes containing mercury. This UNIDO project assists the Philippine government to prepare a national action plan (NAP) for the phase-out of MAPs in accordance with the Convention. To facilitate efficient preparation of the NAP, the project also conducts capacity building activities such as a learning visit to Minamata City to further strengthen the development of the action plans.

Design of the Study Tour

The study tour was designed for key stakeholders in the Philippines in the area of mercury management to learn rich resources of Minamata City on mercury management in comprehensive manner, and so the delegates were expected to discuss and develop a sustainable way to continue such learning activities. The detail objectives of the pilot study tour are:

- to understand resources in Minamata and Kitakyushu which provide different perspectives for learning about mercury management
- to accelerate to finalise the NAP
- to develop a study tour programme which could be sustained with financial sources

Programme

APRIL	21	22	23	24	25	26	
TIME							
9:00	Departure from Manira	Opening Session	The role of the private sector: JNC Corporation	Discussion session on NAP	Kitakyushu Eco Town & Site visit to a plant of recycling fluorescent lamps	Move to Fukuoka City	
10:00		Hair sampling	Learning mercury management from social perspective: Minamata Disease Museum (2 lectures)			Wrap-up session & Closing Session	
11:00		Learning mercury management from regulatory and policy perspective (2 lectures)			Lunch		Lunch
12:00			Move to Isa City & Lunch			Move back to Kokura	
13:00			Lunch				
14:00		Site Visit: Ruin of old hydropower station	Learning mercury management from scientific perspective: National Institute for Minamata Disease	Move to Kitakyushu City by Shinkansen	Explore Kitakyushu	Depart from Fukuoka	
15:00	Arrival & Move by Shinkansen	Move to Yusui Town	Move to Yunoko				
16:00		Site Visit: Kurino hydropower station					
17:00	Arrive in Minamata	Move back to Minamata					

Participants

Participants from the Inter-Agency Technical Working Group for the National Action Plan of the Philippines



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Lectures



Dr. Mitsugu Saito

Deputy Director,
Office of Mercury
Management, Environmental
Health Department,
Ministry of the Environment,
Japan

Mercury management in Japan

The lecture of the Ministry of Environment Japan was delivered by Dr. Mitsugu Saito of the Office of Mercury Management. Dr. Saito gave an overview of the Minamata Convention on Mercury, starting with the historical background of methylmercury (MeHg) contamination in Minamata Bay, resulting in what was eventually called Minamata Disease. In the past two decades, mercury pollution has been shown to be of global concern, leading to the adoption of the Minamata Convention on Mercury which entered into force in 2017. The status of mercury use in products as well as management of mercury waste in Japan was shared, including material flow analysis both domestically and through trade. National policies and laws on mercury management were also discussed, including revisions of laws on municipal and industrial waste that have mercury or mercury compounds. The importance of cooperation and linkages from the level of local communities to international agencies was emphasized with the concept of the “Moyai Initiative,” coming from the Japanese term for a rope that moors boats together.



Dr. Minoru Koga,

Director of Minamata
Environmental Academia

History of Minamata Disease

An overview was given about the events leading to the discovery of Minamata Disease and identification of MeHg contamination into Minamata Bay as the cause of this. Methylmercury was a by-product in the creation of acetaldehyde that was used for plastic manufacturing. Dr. Koga discussed the pathology and the symptoms of the disease that mainly affects the nervous system. Another part of the presentation was the legal struggle of the victims towards receiving compensation for damages from the Chisso corporation, identified as the source of the contamination. There are 2,265 victims that are officially recognized based on national criteria, while around 10,000 more are receiving financial support for treatment. Minamata City and Kumamoto City hosted the Conference of Plenipotentiaries on the Minamata Convention on Mercury in October of 2013.

International Cooperation Activities of Minamata Environmental Academia

Established in April 2016, part of the Academia's network of academic institutions include the National Institute for Minamata Disease (NIMD), five Japanese universities, and the Minamata High School, as well as universities in the People's Republic of China, Hong Kong SAR, Taiwan ROC, Singapore, Vietnam, Thailand, among others. The Academia has also hosted international conferences and training sessions, and often collaborates with agencies of the United Nations such as UNEP and UNIDO.



Dr. Masatake Fujimura

Director for Research General
Coordination/
Director, Department of Basic
Medical Science,
National Institute for Minamata
Disease (NIMD)

Examination of Hair Mercury in Areas Concerned with MeHg Pollution around the World

Dr. Masatake Fujimura of the Institute's Department of Basic Medical Science presented on "Examination of hair mercury in areas concerned with MeHg pollution around the world." Dr. Fujimura explained that apart from bioaccumulation through the food chain, fish and marine animals that have longer life spans, such as tuna, swordfish, and marine mammals are also prone to have higher concentrations of MeHg. Humans can excrete the MeHg that they take in through urine and fecal matter, and if the rate of consumption are equal or less than the rate of excretion, the amount of mercury in the body will gradually decrease.

The previous day, a representative from the institute collected hair samples from the study tour participants to test for total mercury. At this point in the lecture, Dr. Fujimura distributed the results individually to the participants. He explained that the mean level of mercury in hair is usually higher for Japanese males and females compared to the rest of the world, probably because of a diet that is seafood based.



Dr. Kohji Marumoto

Chief, Environmental Chemistry
Section, Department of
Environmental Science and
Epidemiology,
National Institute for Minamata
Disease (NIMD)

Regional Mercury Monitoring in the Atmosphere

Dr. Marumoto focused on the regional monitoring activities for mercury in the atmosphere. He started with a background on the mercury material cycle in the environment and then discussed the contribution of various anthropogenic activities, of which artisanal and small scale gold mining and combustion of coal are the top contributors. In terms of emissions by geographic regions, East and Southeast Asia is the top contributor, showing all the more that this is a key issue to be addressed. Dr. Marumoto also shared analysis of mercury pollution events that may be related to seasonal conditions such as winter and spring, and correlations between carbon monoxide and total gaseous mercury (TGM).

National Institute for Minamata Disease (NIMD)

The NIMD is part of the Ministry of Environment and was established in 1978 to conduct medical studies on Minamata Disease.

Site Visits



Minamata Disease Municipal Museum

Minamata Disease Municipal Museum was established more than 30 years ago to serve as a repository and educational venue to pass on the important lessons learned from the devastating effects of industrial pollution on the environment and the community. The tour started with a video presentation on the history of the disease and how academics and scientists observed neurological defects in cats and other local animals in the area and eventually traced it to the effluents coming from the Chisso factory operations in producing acetaldehyde. While earlier observations were made by Chisso itself, the operations continued because of the factory's crucial role in the industrialization of Japan. The video clearly showed the plight of those who acquired the disease, some mothers bearing children who were already born with the illness. An important lesson passed on is how victims united and were assisted by local governments to demand and eventually receive compensation from the company and the Japanese government.

There are various exhibits in the museum providing information on the science of mercury natural cycles, methylmercury pollution, the concept of bioaccumulation and the pathology of Minamata Disease. A relief map of the entire Minamata Bay, Yatsushiro sea, and surrounding islands also shows the areas affected by the disease, which included parts of Kumamoto Prefecture and the neighboring Kagoshima Prefecture. An interesting portion of the exhibit shows the painstaking and long process of cleaning up and restoring Minamata Bay, which included collecting all contaminated fish and shellfish in the area and entombing them and building a reclamation area that is off-limits to the public. Visitors are also invited to reflect as they view the bay through a glass window - あなたはどんな未来をつくれますか? - What kind of future will you create?





JNC Corporation

The Japan New Chisso Corporation, or JNC Corporation, is a chemical company with a wide array of products that include display materials (liquid crystals, organic electro luminescence), advanced coating materials (different kinds of inks, photosensitive materials, overcoat materials, etc.), electronic components (such as RFIDs), among others. Its company history dates back to 1906, when the Sogi Electric Company was founded as a hydroelectric power station in Okuchi, Kagoshima Prefecture. Since the power plant had an overcapacity beyond what was needed for the gold mines in the area, a sister company was established to produce fertilizer, which later branched out to other chemicals.

The CHISSO group of companies was instrumental in producing industrial chemicals, including plastic products, as part of Japan's period of industrialisation

for most of the 20th century. This included the production of acetaldehyde using a mercury catalyst. However, this came at a great cost of human lives and to the environment, as the release of methylmercury into marine waters beside their factories led what became known as Minamata Disease. Eventually, Chisso was instructed to compensate the victims and clean up Minamata Bay.

Now, reorganized as JNC Corporation since 2011, they have concentrated on developing environment-friendly products. These were on display in their museum and exhibit room that the participants visited during the tour. Of particular interest to the group were the controlled-release fertilisers and granular phosphorus fertilisers. The group was also given a quick tour around the industrial complex.

Old Waterpower Plant & Kurino Waterpower Plant

The day before the visit to the JNC facility, the study tour participants visited the site of the old hydropower station at Sogino-taki Waterfalls in Isa City, Kagoshima Prefecture. Mr. Toshihisa Nagano from JNC discussed the history of the company that started with operation of the hydroelectric power plant in 1906.

The group then visited the Kurino Hydropower Station in Yusui-cho, Kagoshima Prefecture, which is currently in operation. A tour of the facility was given with an explanation of the flow of water from the rivers power the turbines to create hydroelectric power. Since any kind of debris floating on the river should not enter the turbines, a mechanical filtration system is in place and this was demonstrated to the visitors.



Ruins of the Old Hydropower Station (Sogi Electric Company)



Kurino Hydropower Station

Site Visits



Kitakyushu Eco Town & J Relights

The study tour participants were welcomed to the Eco Town museum and watched a short orientation video that introduced the various recycling facilities. After this, the group visited the Japan Recycling Light Technology & System (J Relights), a facility that recycles fluorescent tubes that contain mercury. These lamps are pulverized, decontaminated, and sorted. The recovered phosphor, glass cullets, and aluminum caps are used as material for producing recycled fluorescent lamps - the first factory in Japan that operates on a closed loop system for lamps. This facility was of special interest to the UNIDO Interagency Technical Working Group since a lamp recycling facility was

established from a grant from the Asian Development Bank. The facility in Manila is currently non-operational but there are plans to have it running.



Discussions on NAP

The delegation from the UNIDO Interagency Technical Working Group (IATWG) is composed of representatives from various government ministerial agencies that cover the wide array of mercury-containing products. Each shared updates on their projects towards the National Action Plan for Phase-out of Mercury in Industry, facilitated by Mr. Teddy Monroy of UNIDO.

The presentation from the Department of Environment and Natural Resources Environmental Management Bureau (DENR-EMB) shared that many treatment, storage, and disposal (TSD) facilities can accept busted fluorescent lamps and sludge that contain mercury, but not for other mercury-added products (MAPs) such as medical devices. Currently there are temporary storage facilities for these and eventually some have been exported for treatment by Nomura Kohsan. Commercially available products or devices pass through the approval of the Bureau of Philippine Standards under the Department of Trade and Industry (DTI BPS), which will follow the schedule that will be set by the DENR for phase-down or phase-out of products. Meanwhile, environmental technology providers can seek verification through the Department of Science and Technology Industrial Technology Development Institute (DOST ITDI).

The Department of Health (DOH) covers various aspects of MAPs such as updating of existing policies on the Hg-containing medical devices, phase out of mercury use in dental amalgam, strengthening of

poison centres to respond to chemical spill incidents in schools and management of mercury poisoning cases, etc. The Food and Drug Administration, under the DOH, also checks for pharmaceuticals, food, and cosmetics (e.g. whitening creams) that may contain mercury that are illegally entering the market and sold without approval. This is also similar to the need for checking mercury-containing fertilisers and pesticides which is under the jurisdiction of the Fertilizer and Pesticide Authority of the Department of Agriculture. Meanwhile, the health and safety of workers who are possibly exposed to mercury (such as the artisanal and small scale gold miners, government laboratory workers, etc.) is also monitored by the Occupational Safety and Health Center under the Department of Labor and Employment (DOLE OSHC).

Since mercury enters the Philippines through illegal importation, implementation of stringent border control measures by the Bureau of Customs will be strengthened by detection equipment such as the XRF and spectrometer donated by the Government of Japan. Reduction of MAPs usage at the local government level is implemented by programs of the Department of Interior and Local Government.

Discussions during the tour as well as information and knowledge which the participants learned in Japan are expected to accelerate to hasten the finalisation of the NAP by IATWG.





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