



SOUND CHEMICALS AND WASTE MANAGEMENT FOR SUSTAINABLE DEVELOPMENT

Results, lessons, and human impact from selected GEF-funded projects to implement the Stockholm Convention on Persistent Organic Pollutants



HEALTHCARE WASTE

- Africa Regional
- Kazakhstan
- Kyrgyzstan



UNINTENTIONAL POPs

- China e-waste
- Indonesia



PCBs

- Colombia
- Ecuador



INDUSTRIAL

China copper

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Introduction

At the Seventh Meeting of the Conference of the Parties to the Stockholm Convention (SC COP-7) in Geneva in May 2015, UNDP highlighted the results of its work to protect human health and the environment from POPs through 11 Case Studies from around the world, funded by the GEF.

With an additional 4 years of project experience gained since then, I am very pleased to share with you at this Stockholm Convention COP-9 Meeting in Geneva (29 April to 10 May 2019), some of the latest results of UNDP's work with this publication which highlights the results, lessons learned, and human impact from 8 selected GEF-funded projects to implement the Stockholm Convention on POPs and the Minamata Convention on Mercury. These 8 Case studies are grouped under four categories:

- (a) Healthcare Waste Management (Africa Regional, Kazakhstan, and Kyrgyzstan)
- (b) Unintentional POPs (China, Indonesia)
- (c) PCB Management (Colombia, Ecuador)
- (d) Industrial POPs (China).

These projects are linked to SDG #3: good health and well-being; SDG #5: gender equality; SDG #8: decent work and economic growth; SDG #9: industry, innovation and infrastructure; and SDG #12: responsible consumption and production. It is also directly linked to UNDP Strategic Plan Output 1.3. "Solutions developed at national and sub-national levels for sustainable management of natural resources, ecosystem services, chemicals and wastes." We have highlighted in this publication some of the human interest/impact stories to draw out why the recipient communities feel that the projects are helping their livelihoods and protecting their health. A particular focus of this publication is on gender issues and equality as women strive to play a critical role in protecting the environment.

Since 2004, UNDP has been assisting 84 developing countries and countries with economies in transition in their efforts to sustainably manage the use, disposal, and destruction of POPs, working with private sector partners and NGOs. Through the introduction of life cycle management of POPs and affordable alternative approaches and technologies, 18,203 tonnes of POPs were safely disposed of, reducing the risk of direct exposure to POPs for 2.5 million people.

Without collective efforts by all stakeholders, sound chemical and waste management would not be achieved. We are looking forward to foster and build multi-agency and multi-stakeholder partnerships to deliver our collective support to countries and communities for protecting people and ecosystems from the threats of hazardous chemicals and wastes.



Xiaofang Zhou Director, Montreal Protocol/Chemicals Unit Bureau for Policy and Programme Support UNDP





AFRICA REGIONAL (Ghana, Madagascar, Tanzania, Zambia)

Reducing UPOPs and Mercury Releases from the Health Sector in Africa

Background

This project is directly linked to UNDP's priorities on chemicals and waste and indirectly to climate action and poverty reduction, through improved healthcare waste management to mitigate infections. The project helps Sub-Saharan African countries turn SDGs into action by reducing releases of dioxins, furans and mercury, which are harmful to our planet.

Project Achievements and Impacts

- Healthcare workers in 24 pilot facilities in 4 countries (Ghana, Madagascar, Tanzania and Zambia) have been trained and equipped to correctly and efficiently sort waste at its source, safely store and transport it. Kenya, Uganda, and Jordan have also benefited from HCWM training through this project.
- Ghana, Madagascar and Tanzania completed national policy and regulatory improvements, adopting technical guidelines and a handbook for sustainable HCWM systems.
- 14 facilities have received a total of 18 autoclaves to sterilise their collected infectious waste.
- With the current setup, the amount of dioxins (UPOPs) releases avoided is estimated at 42.1 g-TEQ per year, above the project target of 31.8 g-TEQ per year.

- Non-mercury medical devices have been distributed in all 24 pilot facilities and exchanged with mercury-containing equipment. Based on the supplied items, mercury releases were reduced by 101.26 kg/year, also well above the project target of 25.3 kg/year.
- In Madagascar, the Ministry of Health issued an official memo to all healthcare facilities in the country to stop procurement of mercury-containing medical devices.

Tackling Zambia's Medical Waste Problem

As the furnace heated up, Friday Chola, an operator at Kabwe Central Hospital (KCH), used to sort through the medical waste and flipped open the lid of the chamber to monitor the incineration process. Noticing that the last batch of waste was almost burnt to ashes, Chola would rush for a yellow bag containing an assortment of used syringes, rubber gloves and polythene waste, pour in some of the waste, mix it with a forked rod and then replace the lid to allow the incineration process to continue. Now dressed in protective clothing, Chola recently became an autoclave operator – one of 20 former incinerator operators trained to operate a new healthcare technology that disinfects, neutralizes or contains infectious medical wastes.



DEMONSTRATION OF THE USAGE OF AUTOCLAVES FOR WASTE TREATMENT IN GHANA. PHOTO BY JAN-GERD KÜHLING









EXECUTING AGENCIES **GHANA: MINISTRY OF HEALTH** MADAGASCAR: MINISTRY OF ENVIRONMENT, ECOLOGY AND FORESTS TANZANIA: MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN • ZAMBIA: MINISTRY OF HEALTH

"I knew that my job was risky, but I had no choice. I have to work to feed my family" said Chola, a 30-year old father of two. Three months ago, the health of medical waste handlers was endangered by improper medical waste treatment - they had to regularly deal with cuts and needlestick injuries and were highly exposed to toxic ash and smoke from burning chemicals.

KCH is the largest referral hospital in central Zambia and one of the country's oldest healthcare facilities with a 470-bed capacity. Waste generated at the hospital was previously poorly managed with minimal segregation due to lack of awareness and training for staff on health and environmental effects of infectious waste. Poor handling and disposal of waste through the municipal waste system meant scavenging by waste-pickers for resale and re-use was also a serious health risk. The hospital also used to burn their medical wastes in low-temperature burning chambers or traditional incinerators which produce Unintended Persistent Organic Pollutants (UPOPs), negatively affecting the health of individuals staying or working at the facilities, and those living nearby.

Autoclaves, a game-changer

KCH and two other key health facilities including the country's largest hospital, the University Teaching Hospital, now have a solution to their problems, and a way of cutting emissions of UPOPs - a healthcare waste treatment facility equipped with a highly-effective non-incineration technology known as autoclave. This was achieved with GEF funding with technical support of UNDP, WHO and the NGO "Health Care Without Harm" and implemented by the Ministry of Health.



"With this medical waste treatment plant, our hospital will now be able to effectively and safely handle its healthcare waste. This is a great step forward for both the people and the environment of Kabwe," says Dr. Victor Kusweje, the Medical

Superintendent of KCH. "The burning and incineration of all types of wastes not only inhibit people's right to a healthy environment, but also puts public health at risk," says Winnie Musonda, UNDP's Environmental Advisor in Zambia. The steam-based autoclaves can handle 2,000 kilograms of waste per day and are expected to decontaminate medical waste produced by the beneficiary hospitals and other health centres in surrounding communities.

Key lessons learned from the project

- A comprehensive, integrated approach should be implemented in parallel (policy and guidelines, review of HCWM practices including sorting, training, support to installation and maintenance of equipment and economic feasibility, including through recycling) to increase the chance of success.
- Training provided to local procurement teams in Health Ministries is critical to future expansion of mercury-free and non-incineration technologies.
- The availability of new mercury-free and non-burn treatment technologies in teaching hospitals will also facilitate on-the-ground practical education in the related fields.
- The training of healthcare professionals, especially Environmental Health Officers and Nurses, should be strengthened through higher education institutions to improve the necessary skills to support expansion of such HCWM systems.



AUTOCLAVE OPERATION TRAINING. PHOTO BY UNDP TANZANIA



KAZAKHSTAN

NIP Update, Integration of POPs into National Planning and Promoting Sound Healthcare Waste Management

Background

The project helps the country promote best environmental practices and introduce non-incineration healthcare waste treatment technologies and mercury-free medical devices. Strengthening the capacity of state bodies, industrial enterprises and local authorities in the management and handling of chemicals and hazardous wastes is a key objective. This project is directly related to SDGs #3 and #12 and to UNDP's Strategic Plan. Previously most medical waste was destroyed by incineration. A system for the disposal of infected medical waste in specialized autoclaves with saturated steam under high pressure was proposed. Premises for the centers, and necessary conditions for the operation of the equipment, were provided by the recipients of the equipment.

Project Achievements and Impacts

 Six centers for the disposal of medical waste with two autoclaves in each center with a capacity of 100 kg/hour were created in three pilot regions (Astana, Ust-Kamenogorsk, and Kostanay). The centers in rural areas had autoclaves with a capacity of 20 kg/hr. In total the centers processed 2.5 tonnes of infected healthcare waste annually reducing POPs emissions by 0.1 g/TE/year. 20 people (including 5 women) received training and certificates to work on autoclaves for the disposal of medical waste.

- A system for the safe transportation of medical waste has been created that complies with the requirements of ADR (shredders, specialized containers and vehicles, necessary permits).
- To introduce a uniform system of medical waste management and address issues of waste segregation, a Standard Operating Procedures (SOP) system was developed and tested in the pilot regions.
- In the pilot areas, 18,000 mercury-containing thermometers were replaced with electronic ones with 36 kg of mercury disposed safely. MOUs were signed with local executive bodies in pilot areas to reduce the use of mercury in medicine, and prevent future purchase and use of mercury-containing clinical thermometers.
- 1,400 people (440 males and 960 females) participated in seminars and training courses. Participants came from state bodies, local authorities, industrial enterprises, hospitals and NGOs from all regions. An online course on POPs and



TRAINING ON IDENTIFICATION OF POPs. PHOTO BY ZULFIYA BAISAGATOVA







Mercury issues prepared by the project helps raise awareness on these issues (www.zhasyldamu.kz/ru/proekt-proon/ programa-po-problemam-rtuti.html).

- To increase awareness of project activities, a training seminar was held for countries in the Asian region.
- Amendments made to the Environmental Code of Kazakhstan on the regulation of emissions of dioxins and furans in the flue gases from POPs destruction facilities; introduction of BAT; and Amendments to the Law of Kazakhstan on stricter requirements for public procurement.
- Order of the Minister of Ecology "On approval of the National Plan for the fulfillment of the obligations of the Republic of Kazakhstan under the Stockholm Convention on POPs for 2015-2028".
- Order of the Minister of Energy "On approval of the list of pollutants and types of waste for which emission standards are established".
- Six national standards were approved on the definition of polychlorinated dibenzodioxins and dibenzofurans in the environment.

Anecdote



Bizara Dosmakova, Deputy Director of Waste Department of Ministry of Energy of Republic of Kazakhstan, National Project Director said the following:

"The work on new database inventories of new POPs and UPOPs helped us update our Stockholm Convention compliance plan. They cover potential sources of new POPs in the production of goods, as well as enterprises whose emissions may contain POPs. The methodology for conducting these inventories will serve as a basis for continuing this work. Establishment of non-incineration centers for processing healthcare wastes in pilot regions will be a good basis for further expansion, which will reduce UPOPs emissions and involve healthcare wastes in secondary raw materials. This will positively impact the environment and the quality of life. Recycling plastic waste will contribute to business development and the economy.

One of the important results is the work on amending legislation to permit non-incineration technologies to dispose of healthcare waste helped the establishment of the Centers and the new healthcare waste management system. The approach to inform and train stakeholders visiting pilot regions by using

project-prepared training programmes on capacity building by trained trainers is very effective since we covered a large number of people."

Key lessons learned from the project

- Due to the high cost of laboratory equipment, the state agency responsible for conducting national POPs emission monitoring is currently unable to obtain funding from the state budget. The Project, with the participation of Kazhydromet RSE, did passive sampling of atmospheric air and soil and analyses for POPs content, including UPOPs in five regions. The analysis showed the presence of POPs increasing over time. Monitoring data have been submitted to the Ministry of Energy to use as justification for obtaining funds from the government budget to increase the analytical capacity of the laboratories of Kazhydromet RSE.
- Analysis of the healthcare waste management system in medical institutions showed that waste segregation is carried out according to the class of hazard without separation by type of waste. Also most medical waste is mainly plastic waste. With proper organization of the collection and neutralization system, these wastes can be used as secondary raw materials.
- Model patterns for standard operating procedures in the field of medical waste management have been sent to the Ministry of Health for application at work sites.
- Amendments to the legislation allowing for the use of hightemperature methods as an alternative to combustion has expanded the market for the provision of these services.



TRAINING ON POPS MONITORING. RECETOX CENTRE, MASARYK UNIVERSITY. PHOTO BY 7UI FIYA BAISAGATOVA



KYRGYZSTAN

Protect Human Health and the Environment from UPOPs and Mercury from the Unsound Disposal of Healthcare Waste

Background

This UNDP/GEF project is directly linked to UNDP's priorities on chemicals and waste and indirectly to climate action and poverty reduction, through improved healthcare waste management (HCWM) to mitigate infections. It implements Best Environmental Practices (BEP) and Best Available Technologies (BAT) in healthcare facilities in the capital Bishkek and supports 100 rural health posts in Chui and Issyk-Kul Oblast. Mercury releases (generally due to breakage of mercury thermometers) are reduced by supporting the phaseout of mercury-containing medical equipment and introducing mercury-free alternatives. This project is directly related to SDGs #3 and #12 and to UNDP's Strategic Plan.

Minimizing waste, segregating at source, avoiding incineration, and recycling all conserve resources and energy. Research conducted by the NGO Health Care Without Harm (HCWH) proved that autoclaving has waste CO₂ emissions at least 15 times lower than waste incineration. Improved management of healthcare wastes in and outside of hospitals leads to a reduction in occupational exposure of healthcare staff to pathogens, reduces the occurrence of hospital acquired infections, and reduces exposure of waste handlers, recyclers, and waste-pickers who face hazardous working conditions when in contact with infectious and toxic healthcare waste. Communities living close to waste disposal sites (municipal waste dumps and landfills) or incinerators also benefit.

Project Achievements and Impacts

- National HCWM Strategy and Budget, and National Action Plan approved in July 2017
- A Regulatory and Institutional Analysis (RIA) led to the approval (order of the Ministry of Health in March 2018) of standard operating procedures (SOP) for HCWM and guidelines for monitoring and evaluation of HCWM system in health care organizations. Four documents were approved: (a) Guidance for monitoring and evaluation of the waste management system in health organizations; (b) SOP for the organization of medical waste management system in health organizations; (c) SOP for autoclaving of medical waste at the decontamination (autoclaving) site; and (d) SOP for actions of personnel of health organizations for treatment of medical waste during emergencies.



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