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United Nations Development Programme

ENVIRONMENT AND ENERGY

**UNDP & THE STOCKHOLM CONVENTION
ON PERSISTENT ORGANIC POLLUTANTS (POPs)**



Foreword


Persistent Organic Pollutants (POPs) are chemicals that adversely affect human health and environmental quality when released into the air, water or soil. Even in small quantities, POPs can wreak havoc in human and animal tissue, causing nervous system damage, immune system diseases, reproductive or developmental disorders, and cancers. These pollutants have been given special regulatory attention because they persist in ecosystems for extended periods of time, are capable of travelling long distances on wind and water currents, and increase in concentration within food chains.

POPs present threats to sustainable human development, with the poorest members of the global community most vulnerable to their negative effects. The urban and rural poor routinely face unacceptably high risks of exposure to POPs because of their occupations, living conditions and lack of knowledge about proper handling of chemicals. At the same time, ecosystems that provide essential resources for the survival of the rural poor are threatened by pollution of the soil, water and atmosphere due to releases of POPs.

Assisting developing countries and countries with economies in transition in their efforts to sustainably manage the use, disposal, and destruction of POPs is an important element of UNDP's work in promoting achievement of the Millennium Development Goals (MDGs). UNDP supports the development and introduction of alternatives to POPs, and increased access to the best available and affordable alternative technologies.

With financial support from the Global Environment Facility (GEF) and partners in co-finance, UNDP helps countries meet the objectives of the Stockholm Convention on Persistent Organic Pollutants, with the aim of reducing the vulnerability of the poor to health and environmental stresses originating from improper management of POPs.

UNDP believes that efforts to meet the goals of chemicals-related Multilateral Environmental Agreements, including the Stockholm Convention, will be enhanced by more effectively integrating sound management of chemicals into national development policies and processes. UNDP activities in the area of POPs and hazardous waste management are therefore undertaken within the overall context of a country's framework for sound management of chemicals.



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The Stockholm Convention on Persistent Organic Pollutants (POPs)

The Stockholm Convention on Persistent Organic Pollutants is a global treaty designed to protect human health and the environment from chemicals that do not degrade in the environment for long periods of time, are widely distributed geographically, and accumulate in the fatty tissues of humans and wildlife. Exposure to POPs can lead to serious health effects, including certain types of cancer, birth defects, developmental problems, dysfunctional immune and reproductive systems, and generally greater susceptibility to disease.

Given the long-range dispersion of POPs on wind and water currents, no single government acting alone can protect its citizens or environment from exposure to POPs. The Stockholm Convention, which was adopted in 2001 and entered into force in 2004, requires countries that are parties to it to take measures to eliminate or restrict the production and use of all POPs that are intentionally produced. The Convention also encourages countries to undertake continuous reductions in the amounts of POPs that are unintentionally produced, and to adopt the use of environmentally sound alternative processes and chemicals while promoting sound management of wastes and contaminated products.

UNDP and the Stockholm Convention

UNDP has actively been supporting developing countries, and countries with economies in transition, in their efforts to reduce and eliminate POPs and meet the objectives of the Stockholm Convention.

Many of the challenges and priorities relating to the reduction and elimination of POPs require enhancement of national capacities with respect to human resources development and institutional strengthening, as well as increased availability of technical knowledge and training opportunities. As the United Nations' global development network, with an on-the-ground presence in 166 countries, UNDP is well placed to assist countries in gaining the knowledge, experience and resources required to tackle POPs management and elimination issues.

UNDP assists countries in meeting their commitments under the Stockholm Convention, including:

- Meeting reporting obligations, sharing lessons learned and adopting global best practices.
- Building necessary capacity to implement POPs risk reduction measures, including the disposal of POPs and POPs waste.
- Reducing the exposure and release of POPs to protect human health and the environment.
- Demonstrating effective alternative technologies and practices that avoid POPs releases.

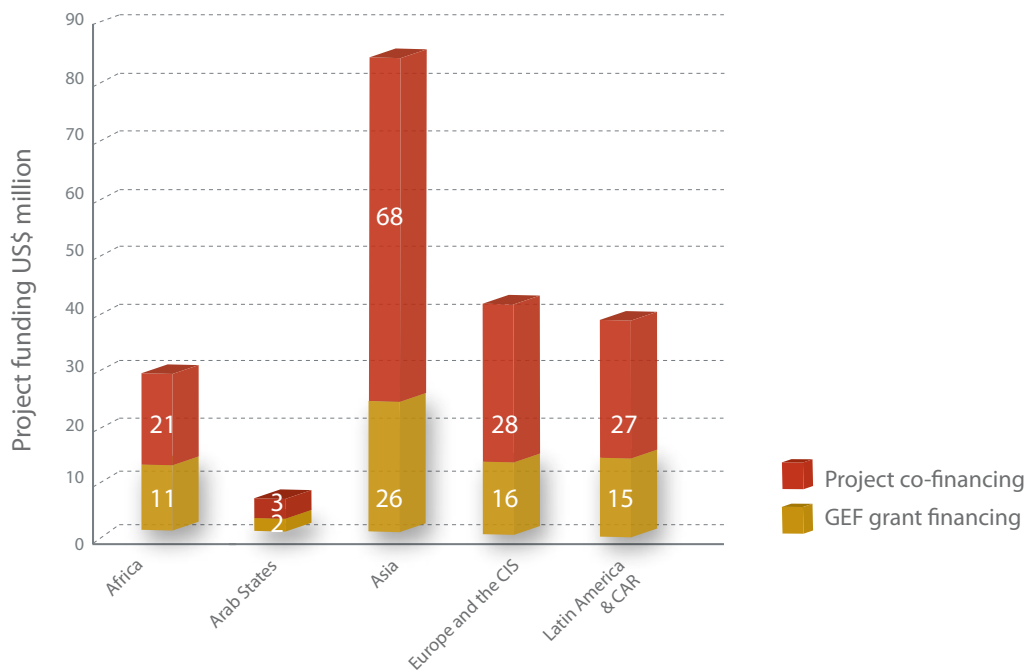


During the early years of the Convention's implementation, much of the focus was on national planning as well as building necessary national capacity, meeting countries' reporting obligations, and compiling the first National Implementation Plans (NIPs).

This initial national POPs planning phase covering the original 12 POPs has now been completed. Hence UNDP's country level action has shifted towards implementing the activities to address POPs priorities that were included in the NIPs.

As of March 2011, UNDP is supporting 22 countries in implementing their NIPs, as well as three global programmes, with a combined portfolio of projects amounting to US \$84 million of grants (programmed through the GEF) and co-financing of US \$152 million. Graph 1 depicts the total project funding by region.

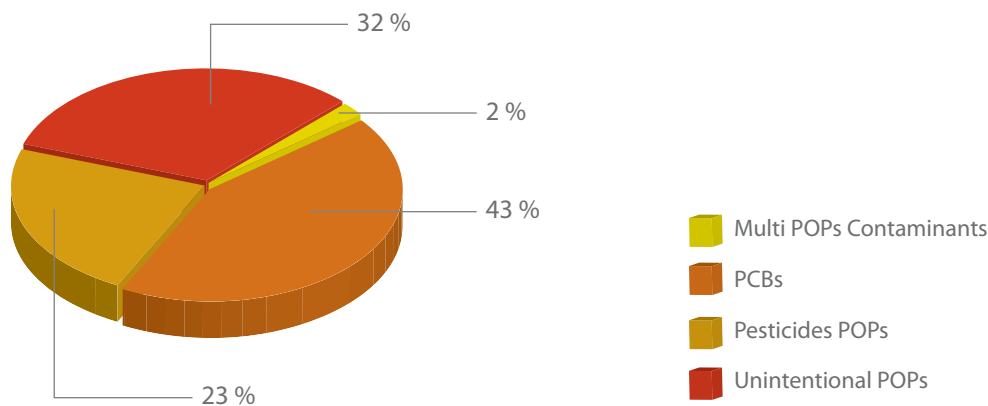
Total UNDP Project Funding



Graph 1. Geographical distribution of UNDP implemented post-NIP projects.

UNDP-supported country projects and global programmes address a variety of national and Stockholm Convention priorities, as well as GEF Strategic Objectives. Through the implementation of projects, UNDP supports the reduction and elimination of all types of POPs contaminants included under the Stockholm Convention (see graph 2), covering a multitude of sectors and activities.

UNDP POPs portfolio by contaminant



Graph 2. Distribution of UNDP's projects by POPs contaminants.

These sectors and activities range from POPs-free agricultural practices to reduction of unintentional POPs releases related to medical waste disposal, and from sound management of PCBs contained in equipment to minimization of the exposure levels of communities living close to contaminated areas.

In addition, UNDP has supported capacity development with respect to POPs management in a large number of countries, as well as through UNDP-implemented projects that aim to integrate the sound management of chemicals into national development planning processes in support of the Strategic Approach to International Chemicals Management (SAICM).

Wherever possible and appropriate, UNDP POPs activities are undertaken within a country's framework for sound management of chemicals, to ensure national coordination among chemicals-related activities in support of regional or global conventions and agreements on chemicals. UNDP's key approaches to helping countries advance the sound management of chemicals include:

- **Campaigning and mobilization** - Advocacy and awareness building among stakeholders about POPs management and sound management of chemicals.
- **Analysis and capacity building** - Identification of innovative practices, policies and institutional reforms to help countries put in place effective POPs and chemicals management structures that are informed by strategic needs assessments and financial evaluations.
- **Technical Assistance** - Specific impact-driven technical assistance for addressing national challenges and constraints affecting the management of POPs and other chemicals.
- **Monitoring and integration** - Assistance to countries in tracking progress on mainstreaming of POPs priorities and sound chemicals management into broader national MDG-based development strategies.

I. Cumulative results from UNDP supported projects towards the implementation of the Stockholm Convention

Because UNDP POPs projects encompass a wide variety of POPs substances and approaches, reporting on the portfolio requires aggregating the results across groups of contaminants. In order to demonstrate the results achieved by the POPs portfolio, four indicators have been selected in the following areas: strengthening of national regulations, capacity building at the national level, and global and local impact.

The selected indicators include: i) number of national overarching POPs or sector regulations adopted; ii) number of people receiving training in POPs management or POPs alternatives (more than 3 days of training); iii) POPs chemicals disposed; and iv) POPs chemicals safeguarded.

As most projects are still under implementation, the results shown below do not reflect the aggregated final results from the ongoing programs.



Indicator	Cumulative result
Number of national POPs regulative instruments adopted	16
Number of people trained in POPs management /alternatives	91,601
POPs disposed (metric tons)	1,295
POPs safeguarded (metric tons)	220

The first compilation of the aggregated results on the POPs projects implemented by UNDP reflects the numerous successes made on the national level to address POPs issues, as well as the emphasis on regulatory strengthening and capacity building in the projects under implementation. Important and valuable experiences have been gained in the safe guarding and disposing of POPs and how to effectively eliminate them from the environment. It is expected that cumulatively the amounts of POPs disposed will be accelerated in coming years as the focus of many ongoing projects is shifting from capacity building to direct POPs handling and release-avoiding activities. For example, a recently completed project in Latvia overshot its target disposing 596 tons of PCBs waste instead of 280 tons as planned.

II. Knowledge products developed in implementing the Stockholm Convention provisions

Most UNDP implemented projects are introducing new approaches and practices that often result in various technical guidelines with varying regulative status at national level. These guidelines typically draw upon international guidelines developed under the Stockholm and Basel Conventions, while adapting to local conditions and languages.

In addition to national technical guidelines and awareness materials, general knowledge products have also been developed in areas where traditionally, less attention has been given to POPs and other hazardous substances of global concern. UNDP implemented projects have been particularly active in developing innovative guidance materials on POPs and mercury releases from health care waste facilities and operations. See the box on pages 16-17 for details.

III. Sound management and disposal of POPs pesticides

UNDP assists countries in the implementation of POPs pesticides projects, building countries' capacity to soundly manage and dispose of POPs pesticides. UNDP is currently assisting four countries with the implementation of five POPs pesticide projects, and additional pesticide project proposal ideas are under development. There are also POPs multi-contaminant projects implemented by UNDP that include important POPs pesticide components.

With respect to the sound management and disposal of POPs pesticides, UNDP supports countries in:

- **Developing national capacity to safely manage and dispose of obsolete POPs pesticide stockpiles.** This involves training in how to identify, label, remove and transport obsolete POPs pesticides, improvement of national storage facilities and infrastructure to allow for the temporary safe storage of obsolete POPs pesticides, and identification of environmentally sound solutions for final disposal.
- **Promoting sustainable alternatives to POPs pesticides.** This involves testing of POPs-free alternatives, awareness building about POPs-free alternatives, support for the conversion of POPs production technologies into POPs-free production opportunities, and application of Integrated Pest Management practices where possible.

In China, UNDP supports the implementation of two POPs pesticide management projects. The first project supports testing of alternatives to promote production of POPs-free pesticides rather than DDT-based ones. At the same time the project promotes Integrated Pest Management practices as an alternative to POPs and to reduce the country's reliance on pesticides. The second project supports the phase-out of DDT used as an anti-fouling ingredient in marine paints (see box).

In Georgia, Nicaragua and Viet Nam, UNDP is supporting the safe management and disposal of obsolete POPs pesticide stockpiles, while helping the governments address associated contamination caused by these stockpiles.



China - Alternatives to DDT usage in the production of anti-fouling paints

Anti-fouling paint is applied to the underwater hulls of boats to prevent the accumulation of slime, algae, weeds, barnacles and tube worms, which can cause structural damage, corrosion, and increased friction resulting in higher fuel consumption and lower navigational efficiency and profitability. China is still applying DDT-based anti-fouling paint on fishing vessels, and with a significant number of vessels operating along its extensive coast line, is very keen to end the use of DDT as an additive in the production of anti-fouling paints. This would reduce the release of DDT from Chinese fishing vessels into the marine environment by an estimated 250 metric tons annually.

The project's objective is to find technically feasible, economically viable, and environmentally friendly non-toxic alternatives to DDT-based anti-fouling paints. In addition, the project aims to establish a long-term mechanism for protecting the marine environment and human health from chemical pollution originating from anti-fouling systems. Finding non-toxic alternatives is of the utmost importance in China, because it has a large and growing ship-making and shipping industry. In addition to phasing out DDT in marine paints, the project will also provide alternatives for other hazardous biocides used in anti-fouling applications, particularly tributyltin (TBT).

The project is financed in part by the GEF, with co-financing contributions from China's central and local governments, and the Chinese private sector.

To date, the project has:

- Introduced an international environmental risk management system for marine paints adapted to the situation in China.



Testing alternatives to DDT-based anti-fouling paints

- Created an enabling policy environment for the phase-out of DDT-based anti-fouling paint, by facilitating the revision and/or establishment of applicable regulations and standards.
- Established a voluntary certification and labeling programme for marine paints.
- Facilitated the closure of the Tianjin Chemical Plant, the supplier of DDT for antifouling paint production.
- Tested 58 alternative anti-fouling paints free of DDT or other POPs. Viable alternatives for scale production and promotion will be selected in the near future.
- Developed an incentive programme to promote the alternative products in market.
- Improved knowledge of POPs-free alternatives through public awareness and advocacy.

The project conducts pilots in three coastal areas of China, selecting alternatives by rounds of panel and ship experiments to test the anti-fouling efficacy and sequential environmental risk analysis and environmental impact assessment to ensure the environmental soundness. In 2011, the suitable alternative(s) for each area will be selected for production, promotion and distribution as the replacement for DDT-based anti-fouling paints. The voluntary certification and labeling programme, newly developed incentives programme and enabling policies environment established with the support of the project will coherently work for the promotion of alternatives free of DDT in China's market.

IV. Management of PCBs

The largest part of UNDP's POPs project portfolio focuses on the management of PCBs. To date, GEF funding has been approved for UNDP-supported PCB management activities in the following 11 countries: Argentina, Brazil, Ghana, Jordan, Kazakhstan, Kyrgyzstan, Latvia, Mexico, Morocco, Slovak Republic and Uruguay.

With respect to the management and disposal of PCBs, UNDP supports these countries in:

- **Strengthening legal frameworks and improving enforcement capacity pertaining to PCB management** by addressing gaps in national PCB management regulations and creating an enabling environment for the environmentally sound management and destruction of PCBs.
- **Undertaking additional PCB inventories to identify remaining geographically dispersed PCBs and sensitive sites**, for example by identifying small and medium-sized enterprises possessing a portion of the remaining inventory.

Mexico - Environmentally Sound Management and Destruction of PCBs

In Mexico, initial national inventory found PCB containing oils in all 13 states which were sampled (out of 32) indicating that the whole country is affected by PCBs. As many sources of PCBs are in highly populated areas, the PCBs have a potential to adversely affect society, especially children and workers, if left unchecked and unmanaged. Considering the extent of the PCB issue and the potential risks to human health and the environment the Government of Mexico and UNDP initiated a project, co-funded by GEF, for addressing the situation.

The project, executed in partnership with the federal Ministry of Environment (SEMARNAT), aims at strengthening the capacity for sound management of PCBs, materials and equipment which may contain or may be contaminated by PCBs. Towards this end, the project is supporting the strengthening of regulatory provisions, organizing targeted training sessions both for policy makers and specialists and evaluating infrastructure capacities. The project will further undertake awareness raising campaigns on the health and environmental consequences of poor PCB management. The project is also expected to destroy 3.215 tons of PCBs which constitute about 10.5 % of total estimated remaining national inventory.

As electrical maintenance workshops are the main source of cross-contaminating transformers with PCB oils, the project analyzed the hazardous waste management practices at 6 electrical maintenance workshops. Based on the findings the project put forward recommendations to lower exposure risks for employees handling PCB containing materials and to ensure overall environmentally sound management of PCBs at these facilities.

Based on the analysis of the current management practices and a regulatory assessment, the project has proposed a revised technical Standard for PCB management. The proposed Standard includes regulation of electrical maintenance workshops at local and provincial levels, in order to assure proper management of PCBs containing oils to avoid further cross contamination of transformers in Mexico. This revised Standard has been presented to federal authorities for review and adoption.

- Improving PCB management practices (such as handling, storage, transport, and destruction) by providing technical guidance on management and safe disposal of PCBs and training for government officials, handlers of PCB-containing equipment, and other private sector entities, to ensure the sound management of PCBs throughout their life cycle.
- Ensuring safe disposal of PCBs in collaboration with PCB-containing equipment holders, by developing safe domestic disposal facilities, facilitating export of PCB waste to safe disposal facilities abroad, and improving coordination among PCB holders to lower the cost of transport and destruction of PCBs.
- Implementing public awareness campaigns and communication strategies to support all of the above activities.



Removal of recycled PCB-containing materials used as building material in a community of San Felipe Nuevo Mercurio

During the inventory of PCB contamination sources, the project confirmed SEMARNAT's information that some poor communities use the barrels, which formerly stored illegally imported PCB contaminated oils, as building materials and water containers. As part of awareness and outreach efforts, the project has replaced such contaminated metal construction materials with safe ones in a small community of San Felipe Nuevo Mercurio (300 inhabitants) in the state of Zacatecas.

The high cost of destroying small quantities of PCBs in a large country is a barrier for small and medium-sized enterprises since they cannot take advantage of the economies of scale with respect to costs of transport, interim storage and decontamination and/or destruction. Therefore, the project has devised a PCB management system, tested through pilot projects at local and provincial levels, that will allow a large number of PCB possessors to pool their waste and achieve environmentally sound disposal of PCBs at a reasonable cost.

As a result of the various activities of the project, the unit cost of destruction for pooled PCB waste (where companies can bring as little as one piece of equipment) is approaching the cost for large possessors of PCB containing equipment like Mexico's Federal Electricity Commission (CFE). This Integrated Services Management System for PCBs elimination has so far been tested in the state of Guanajuato and the municipality of Cuautitlan (state of Mexico) before wider roll out at country level.



V. Avoiding the release of unintentionally produced POPs (UPOPs)

Certain POPs, such as dioxins, furans, HCBs and PCBs, are unintentionally formed and released during industrial processes, and from combustion, including uncontrolled waste burning, power plants, and waste incinerators.

UNDP supports countries in their efforts to reduce and eliminate such unintentional releases by:

- Gradual implementation of best available techniques (BAT) and best environmental practices (BEP) for existing sources.
- Use of best available techniques and best environmental practices for new sources.

UNDP is currently working on reduction of UPOPs releases through the implementation of three very different projects. Two are individual country projects: in Viet Nam and Nigeria. In addition a 'global' project is being implemented in seven countries: Argentina, India, Latvia, Lebanon, Philippines, Senegal and Viet Nam.

In Viet Nam, the UPOPs activities focus on minimizing human exposure from highly dioxin-contaminated areas. The project is designed to remediate these contaminated areas, which are threatening the health of large communities by causing birth defects, and also diminishing livelihoods and economic development prospects.

In Nigeria, the project aims to reduce UPOPs releases caused by uncontrolled burning of wastes through the introduction of sustainable waste management practices at community level. UNDP will also support Nigeria in taking UPOPs reducing approaches in designing waste management strategies, and reducing emissions of UPOPs emitted by open burning agricultural practices.

The 'global' project is a partnership between UNDP, the World Health Organization (WHO), the international NGO Health Care Without Harm (HCWH) and other major donors and partners. The project aims to minimize emissions of dioxins and mercury from medical waste by demonstrating and promoting best techniques and practices for reducing healthcare waste in seven countries.

Reducing unintentional releases of POPs from healthcare waste management

The health sector is a major source of dioxin and mercury releases to the global environment, primarily as a result of low technology medical waste incineration and the breakage and improper disposal of mercury-containing devices such as thermometers and blood-pressure meters.

The Stockholm Convention gives priority to the promotion of waste treatment technologies and practices that are as effective as medical waste incineration and avoid the unintentional formation and release of POPs. However, healthcare sectors in many countries lack essential equipment and knowledge for proper waste treatment, as well as resources for training, technical assistance and policy development.

A partnership between UNDP, the World Health Organization (WHO) and the international NGO Health Care Without Harm, as well as other major donors and stakeholders, is assisting seven countries – Argentina, India, Latvia, Lebanon, Philippines, Senegal and Viet Nam – in developing and sustaining best healthcare waste management practices in ways that are both locally appropriate and globally replicable.

In each participating country, the project is developing model hospitals to demonstrate best practices in healthcare waste management (HCWM). The project promotes the use of non-burn waste treatment technologies, waste minimization and segregation as well as safe mercury storage and alternatives to mercury-containing devices. An additional project in Tanzania is developing affordable and effective healthcare waste treatment technologies appropriate to conditions in much of sub-Saharan Africa.

The project, which received financial support from GEF, has undertaken the following:

- It has filled a gap in global knowledge by developing guidance documents to help health facilities assess their HCWM situation and subsequently adopt best practices on minimizing UPOPs releases and phasing out of mercury-containing devices and materials in hospital and dental clinics. The project also compiled information about non-incineration technologies commercially available around the world. These documents are found on a project website www.gefmedwaste.org.
- Introducing best practices in the participating countries at facilities ranging from a large 3000-bed hospital in a low-income area to public and private hospitals with 50 to 500 beds in both urban and rural communities, to small clinics and remote health posts. The project is supporting centralized waste treatment facilities in Latvia, Lebanon and India that process from 300 to 2300 tonnes of healthcare waste per year, helping them optimize operating procedures of already installed non-incineration technologies.
- A variety of state-of-the-art in-house non-incineration treatment technologies are being demonstrated. These include autoclave-shredder systems, rotating autoclaves, advanced steam treatment systems, microwave technologies, and specialized technologies for anatomical waste. Based on technical specifications developed by the project, bidding processes are underway for non-incineration technologies intended for health facilities in the Philippines, India and Senegal.



Demonstrating and promoting best techniques and practices for reducing healthcare waste to avoid environmental releases of dioxins and mercury. UNDP GEF Global Healthcare Waste Project at Bagamoyo District Hospital

- The project is working on low-cost appropriate non-incineration technologies for low-income areas with the University of Dar-es-Salaam to meet Sub-Saharan needs. An international advisory committee has reviewed the designs and prototype building and testing are underway. To demonstrate the concept, the project modified and installed a low-cost autoclave and shredder at one district hospital in Tanzania.
- National policies and regulations pertaining to HCWM and the management and phase-out of mercury-containing devices have been reviewed and are being improved in India, Latvia, Lebanon, Philippines and Viet Nam. Some project countries and cities, such as the Philippines, Argentina, and New Delhi, have already established policies for the phase-out of mercury-containing medical devices.
- The project has developed a range of training materials to ensure the sustainability of results.

The project's ultimate goal is protection of public health and the global environment from the impacts of dioxin and mercury releases. If replicated nationally and sustained, best practices and techniques initiated during the project are expected to substantially reduce annual releases of dioxins (by 187 g I-TEQ) and mercury (by 2,910 kg) to the environment from the participating countries' healthcare sectors.

Photography credits:

Cover: Fisherman along the Wataboo beach casts net in the water to catch small fish © UN Photo/Martine Perret, Industrial area, India © SR library

Page 5: A Tanzanian maintains a fish pond, provided by United Nations Development Programme (UNDP) seed money. Fish farming is now the world's fastest growing food production sector, providing a livelihood for 250 million people © UN Photo/Evan Schneider

Page 8: Farming for Development: Rice Fields in Indonesia © UN Photo/Ray Witlin

Page 14: Asian working women in an industrial area © Istockphoto

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