

Synthesis
Report
on the

Global Monitoring Plan on POPs:

Sustainability Analysis



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ABBREVIATIONS

CETESB	Environmental Agency for the State of São Paulo
COP	Conference of the Parties
GC-HRMS	Gas Chromatography – High Resolution Mass Spectrometry
GEF	Global Environment Facility
GMP	Global Monitoring Plan
JESC	Japan Environmental Sanitation Center
LC-MS/MS	Liquid Chromatography- tandem Mass Spectrometry
OCPs	Organochlorine Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PFAS	Per- and polyfluoroalkyl substances
POPs	Persistent Organic Pollutants
POPsEA	Persistent Organic Pollutants Project in East Asian
PUF	Polyurethane foam
RECETOX	Research Centre for Environmental Chemistry and Ecotoxicology
SOPs	Standard Operating Procedures
UNITAR	United Nations Institute for Training and Research
UNDP	United Nations Development Programme
WHO	World Health Organization

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EXECUTIVE SUMMARY

The Global Monitoring Plan (GMP) under the Stockholm Convention on Persistent Organic Pollutants (POPs) is a framework that enables collection of comparable monitoring data from all regions of the world to evaluate the effectiveness of the Stockholm Convention in minimizing human and environmental exposure to POPs. The GMP leads the development of the global and regional global monitoring reports. The first and second regional monitoring reports were welcomed by the Conference of the Parties at its fourth meeting COP.4 in 2009 and its seventh meeting COP.7 in 2015 respectively. While the first monitoring reports provided information on the baseline concentrations of the 12 “legacy” POPs, the second global monitoring report provided first indications as to the changes in concentrations of the 12 chemicals initially listed in the Convention, as well as baseline information on the newly listed POPs.

Sustaining the GMP is crucial to monitor progress made in the world regarding the effectiveness of the Convention. The GMP has proven to be successful in countries and regions; the two case studies presented provide an example of how such systems can be of service to the regions and how a coordinated effort supports its sustainability. While the East Asia case study demonstrates a collaborative effort to assist countries in that region to contribute to the GMP, the Brazilian example highlights the efforts made by a designated laboratory to support the region to contribute to the GMP and to monitor POPs effectively, highlighting the opportunities and challenges faced by laboratories to be sustainable and to continue to operate.

PAPER:

01

CASE STUDIES



Introduction and Context

Article 16 of the Stockholm Convention stipulates that the effectiveness of the Convention shall be evaluated four years after the date of entry into force (17 May 2004) of the Convention and periodically thereafter (Secretariat of the Stockholm Convention 2019). The Effectiveness Evaluation includes a Global Monitoring Plan (GMP), which is a framework that include several monitoring networks that monitors the presence of Persistent Organic Pollutants (POPs) in the environment and in humans and suggests that such monitoring and subsequent assessment should be undertaken on a regional basis. One of the objectives of the GMP is to assess the regional and global transport of POPs and presence in humans and the environment, and to support the effectiveness evaluation process of the Stockholm Convention. The GMP focused initially on the core media of blood and mothers' milk to examine human exposure, ambient air to examine long-range transport and water only for Per- and polyfluoroalkyl substances (PFAS).

The Conference of the Parties (COP) completed its first effectiveness evaluation at its fourth meeting COP.4 in 2009, based on the first Global Monitoring Report (Secretariat of the Stockholm Convention n.d.). Among other elements, the report stressed the **limited data available** and **constrained capacity for sustained monitoring** in regions.

In the last 10 years, the Global Environment Facility (GEF) has supported regional activities to set up and maintain a Global Monitoring Projects on POPs. The projects have had some success stories, training was conducted, and data obtained. However, the projects have struggled to sustain itself and secure resources beyond GEF funding. This could be a problem for the future of the GMP, which is now assessing alternatives for sustainability.

Global Monitoring Plan Case Studies

Case Study 1:

East-Asia Air Monitoring Network

SUMMARY

<p>Title: POPsEA</p> <p>Service: POPs Air Monitoring</p> <p>End users: Government agencies, expert groups, air managers, policy makers, researchers, local communities</p>	<p>Media monitored: Air</p> <p>Agency that produces records/ reports: National Institute for Environmental Studies, Japan; Japan Environmental Sanitation Center (JESC) as the Secretariat to the POPsEA project (on behalf of the Ministry of Environment of Japan)</p>
<p>Intermediate users: National Institute for Environmental Studies, Japan BRS Secretariat</p> <p>Application(s): Publication of Sub-regional Report to share the monitoring data and to submit to the Regional Organizing Group for the Effectiveness Evaluation of the Stockholm Convention. No specific website is provided.</p> <p>Methods used: Collection and analysis of air samplers (PUFs) any satellite imagery?</p>	<p>Sustainability of Service (demonstration or ongoing): Activities commenced in 2001 and it is an 18-years project. It is expected to continue monitoring the presence of POPs in the air in the East Asia region.</p>



Figure 1. UN Asian region.

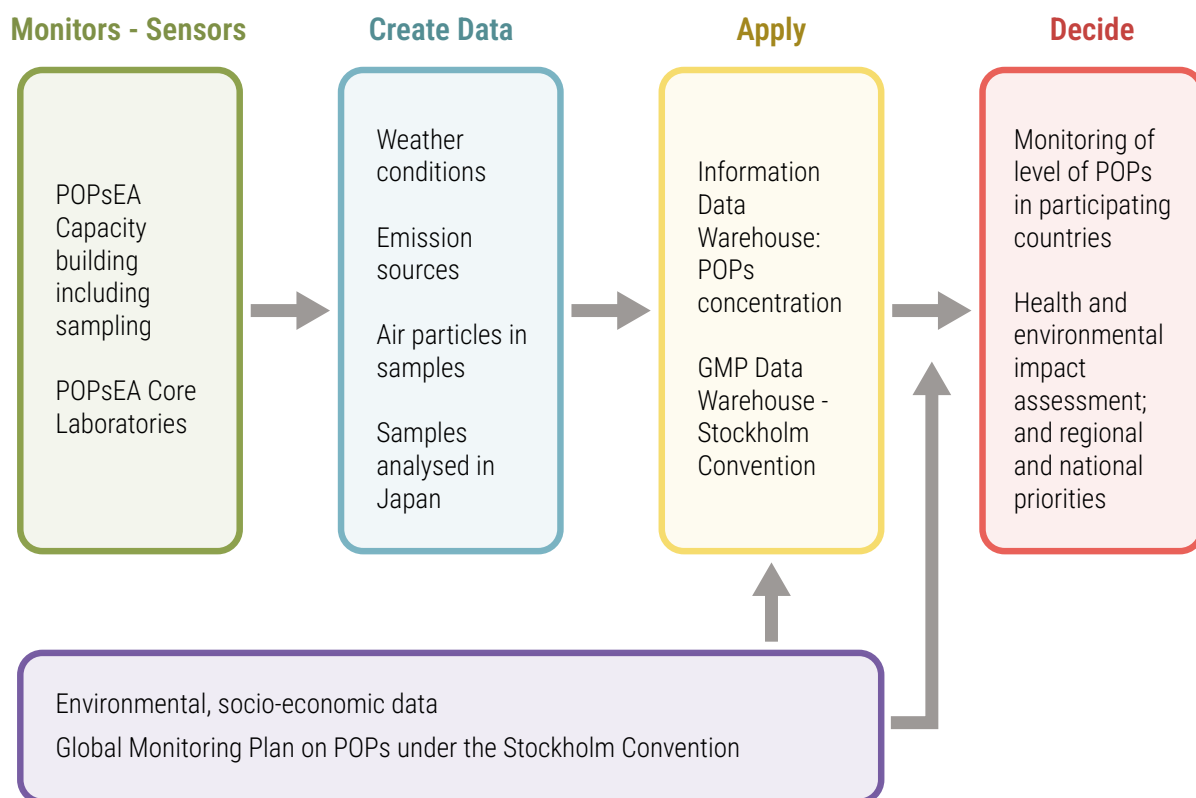


Figure 2: Information Flow

1. Description

Most countries in the Asian region share common challenges in complying with Article 16 of the Stockholm Convention to monitor POPs, produce comparable data and to contribute to evaluating the effectiveness of the implementation of the Convention. There are many countries that lack sufficient funds, appropriate technology, knowledge, or personnel to develop a solid national and regional POPs monitoring networks.

The environmental monitoring of Persistent Organic Pollutants Project in East Asian Countries (POPsEA project) is a collaboration that contributes to the development of the POPs Global Monitoring Plan under the Stockholm Convention. The programme is led by the Ministry of Environment of Japan and was initiated in 2001 with its first workshop held in Tokyo. It includes Cambodia, Indonesia, Lao PDR, Malaysia, Mongolia, Philippines, Thailand and Viet Nam. The objective of the POPsEA is to build POPs monitoring capacity in the East Asia region and to compile the monitored data and background sites to contribute the GMP for the Stockholm Convention and the effectiveness evaluation as stated in Article 16.

2. Activities

Capacity Building

The POPsEA Programme's core media is air and has set active and passive air samplers in each of the participating countries. The programme's capacity building component has donated air samplers and equipment to participating countries, as well as facilitated technology transfer for sample collection. Starting in 2004, the programme commenced monitoring of two sites: Tam Dao in Viet Nam and Tangerang in Indonesia. From 2005, the programme has further set monitoring stations in: Cambodia (Sihanoukville), Indonesia (Berastagi, Kototabang), Japan (Hateruma, Hedo), Republic of Korea (Goisan, Taeon, Jeju), Lao PDR (Na Long Koun Village), Malaysia (Muda Dam, Batu Embun), Mongolia (Terelj), Philippines (Baguio), and Thailand (Ayuttaya, Doi Inthanon, Khao Yai).

From 2001, Japan and the Republic of Korea have developed and implemented a Bilateral Programme for the Harmonization of POPs monitoring methods. From 2004, Japan has been providing technical support for sampling and analysis of POPs to participating countries. Starting in 2011, the Republic of Korea has organized training workshops on sampling and analysis of POPs, and from 2006 has developed and maintained an Information Data Warehouse considering the harmonization to the Data Warehouse from BRS Secretariat hosted by Research Centre for Environmental Chemistry and Ecotoxicology (RECETOX) – Masaryk University, Brno, Czech Republic.

3. Monitoring

Japan and the Republic of Korea perform monthly monitoring of all POPs at their “super-sites” in Hedo Cape and Jeju respectively. The other participating countries collect air samples with the support of Japanese experts and target the initial 12 POPs. Samples are then analysed by the JESC with budget from the Ministry of Environment of Japan.



Figure 3: Current monitoring sites (super-sites in red) in participating countries; location of the active samplers installed under the POPsEA Programme

Core laboratories

At present, all samples under the POPsEA Project are analysed in Japan and the Republic of Korea. After conducting a feasibility study on laboratories' capacity, the POPsEA Project will identify and establish Core Laboratories that will work at their own expense (or that of host countries), while technical and financial support will be considered for capacity building activities. It is expected that the core laboratories will work with Japan and the Republic of Korea to monitor POPs effectively in the region on a monthly or quarterly basis, according to their own capacities.

The Goal of the Capacity Building for Core Laboratories is to target all POPs and include all core media, not only air. Regarding the technical aspect of it, the following outputs are expected:

- a) National technical manual on POPs monitoring and Standard Operating Procedures (SOPs);
- b) Internationally comparable data generated;
- c) Establishment of a procurement system to buy reagents and consumables;
- d) Implementing the training course for support to the other member countries of POPsEA project. A technical seminar, on-site training, assisting the POPs monitoring is expected;
- e) Technical cooperation between experts from participating countries and lead countries, including training programmes for regional experts;
- f) Establishment of a domestic framework for sustainable POPs monitoring

4. General considerations:

- Regional POPs monitoring programmes provide valuable resources and support for chemicals analysis and monitoring. Sharing the results of the POPsEA with relevant sectoral scientific laboratories. This will facilitate the objective to develop national chemical monitoring programmes and will establish evidence-based policy-making processes leading to substantive evaluation of the current regulations related to POPs.
- The POPsEA project provides a framework for cooperation and capacity building regarding POPs monitoring and has been successful in setting a solid network of monitoring sites and a clear process to analyse samples in the region.
- Future sustainability would depend on the self-financed activities in which countries will be responsible for supporting the monitoring programme at the national level. In that sense public-private partnerships are essential for enhancing infrastructure and capacity for POPs management. The inclusion of industries with scientific knowledge and technologies is feasible and can help to maintain a POPs monitoring system in the region.

Case Study 2:

POPs Laboratory in São Paulo, Brazil

SUMMARY

Title:

CETESB Laboratory

Service:

POPs air, water, sediment

End users:

Government agencies, expert groups, air/ water managers, policy makers

Intermediate users:

State of São Paulo, Government of Brazil

Application(s):

POPs Analysis data produced as concentration of POPs in different media

Methods used:

Sample preparation for air (PUFs collected and analysed), sediment and water through extraction and clean up fractionation.

Agency that produces records/ reports:

Companhia Ambiental do Estado de São Paulo

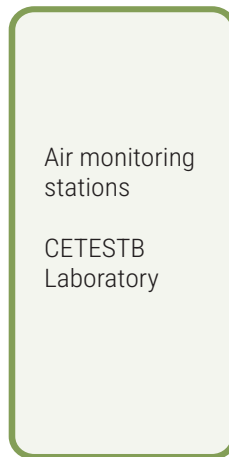
Sustainability of Service (demonstration or ongoing):

CETESB has provided sampling and analysis of POPs for the GMP since the start of the GMP Programme Phase I (in 2009).

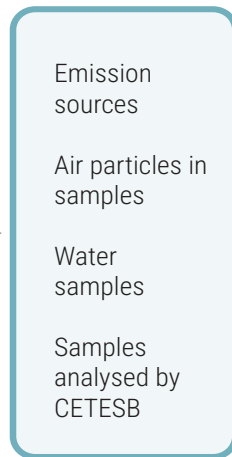


Figure 4: Map of Brazil in the GRULAC region.

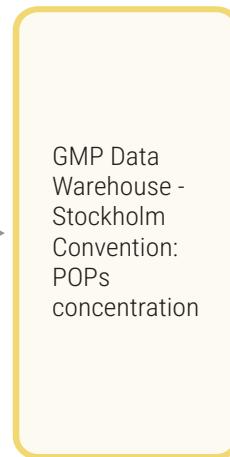
Monitors - Sensors



Create Data



Apply



Decide

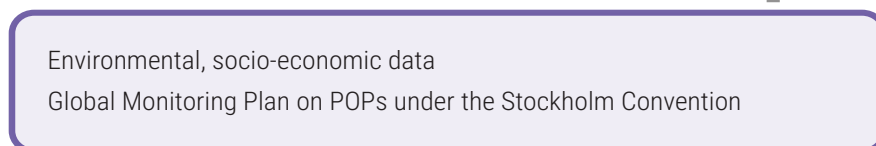


Figure 5: Information Flow

1. Description

The Environmental Agency for the State of São Paulo (CETESB) is responsible for the control, licensing, inspection and monitoring of activities that might potentially pollute (Companhia Ambiental do Estado de São Paulo [CETESB] n.d.). The company was established in 1968, as a technological centre to carry out laboratory tests, surveys, research and training in sanitary engineering. During the 1970s and 1980s it was consolidated as the Environmental Agency of the State, and nowadays it is recognized by the World Health Organization (WHO) and United Nations

Development Programme (UNDP) as a leading institution in Latin America and the Caribbean for pollution control (water, air, and soil) and environmental preservation. CETESB is part of the 16 UN reference Centers working on environment-related issues. It is also one of the five institutions that support the activities of the WHO regarding water quality and also provides services to the UNDP regarding hazardous waste in Latin America. To support the company activities, CETESB has laboratories strategically distributed within the state. The main laboratory complex is located at its headquarters in the city of São Paulo, and it is structured according to specialisms: chemistry, hydrobiology, microbiology and parasitology, human toxicology and ecotoxicology. Seven decentralized laboratories give support for regional offices carrying out basic tests for regulation compliance. Currently, the analytical capacity of these laboratories is being adapted in order to meet the local needs of the region where they are located.

The Chemical analysis laboratory was established in 1975 with basic physical-chemical parameters in drinking and surface water samples. The first group of organic compounds analysis implemented were organochlorine and organophosphorus pesticides. In the beginning of the 1980s the laboratory started to analyse polychlorinated biphenyls (PCBs) in dielectric fluids (transformers) and water samples. Nowadays, the laboratory performs a great diversity of organic tests, including POPs analysis (organochlorine pesticides (OCPs), dioxin, furans, PCBs, dl-PCBs, PBDEs, PBB and PFAS) to support CETESB's activities.

CETESB's mission is to promote and to ensure the environmental quality of São Paulo State in order to ensure communities and ecosystems are diverse, sustainable and economically productive. To accomplish this task, the company has its headquarters in the state capital, São Paulo City, and 56 regional offices throughout the state, with a staff of about 2,000 employees, highly specialized, with different professional backgrounds: biology, chemistry, biochemistry, administration, sociology, economics, law, and others, many of them with a Master degree or PhD. All these professionals, committed to environmental protection and public health, are involved in a series of activities and projects related to environmental quality monitoring (surface water and sediments, air and emissions, soil and groundwater), control of pollution and its sources (permits and enforcement), research and development, cleaner production, contaminated site management, solid waste management (municipal, industrial, medical), environmental accidents, health and environment risk assessment, and climatic changes.

To support all these activities, the laboratories perform more than 250,000 analyses per year, encompassing a wide variety of physical, chemical, biological and toxicological tests on diverse matrices. Most of the analytical data are published annually in Environmental Quality Reports, which are available to the public on CETESB's website (CETESB n.d.).

The analytical range of these laboratories expanded over the last 40 years in parallel with the rising importance of environmental issues, extending the capacity of the state and the country to be more effective in the pollution control and the assessment of environmental quality.

Within CETESB's quality monitoring programmes, laboratory analyses are done to verify compliance with state and federal laws, which comprise physical, chemical and biological standards, as well as many other analyses that are not regulated, but are part of the quality indices used by CETESB to evaluate and monitor state environmental conditions. New techniques are constantly being researched or developed, to improve the scientific background and expertise.

To meet all the company demands, the chemical analysis laboratory has a strong quality control programme, including besides the routine tests of QC participation in proficiency assays and analyses of certificate reference material. The scope of ISO/IEC 17025 accreditation for organic compounds tests covers volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides, organophosphorus pesticides, herbicides, chlorinated phenols, PCB, dl-PCBs, dioxins and furans for environmental matrices.

In order to keep the laboratory staff updated with developments, CETESB maintains a training programme that includes specific courses, participation at national and international scientific events, technical visits and practical training in reference laboratories. It is also considered highly important to share information with international agencies and academic institutions, in the latter case cooperating in projects and graduate programmes.

Innovation to procure equipment and provide maintenance

Taking into account the difficulties from State Government to invest in analysis of Chemicals, CETESB has been looking for funds to purchase equipment, parts and maintenance through different projects, usually São Paulo's State projects. Maintenance of POPs laboratories is challenging, as parts and services are normally difficult to find in Brazil and expensive, it takes a long time to find financial resources and, on the other hand, service suppliers take a long time to fix the equipment. CETESB has considered investing in an extension of the warranty (to 5 years), instead of the standard one-year factory warranty, when purchasing the new equipment. This might help with the delays in providing services to the equipment and avoid the need to find financial resources to import parts.

2. Activities

CETESB and Policy making

The environmental analysis laboratories from CETESB are continually working to diagnose environmental problems and to search for better indicators to measure the quality of the environment and so to provide credible data for decision makers to safeguard human health and ecosystems from environmental pollutants.

CETESB has an effective participation in the elaboration of National Council and state regulation. The services provided by CETESB provide the necessary evidence and justification to elaborate policies related to the protection of the environment and human health in the State of São Paulo.

CETESB and Capacity Building in the region

The knowledge and expertise acquired by CETESB technicians are transferred to several sectors of society, such as public organizations and universities, through courses, practical training, workshops, seminars, as well as by scientific publications and reports. The company has performed an important role in the capacity building for environmental analytical methods at state, national and regional (Latin America) level. CETESB strongly supports south to south cooperation.

3. General considerations and challenges

The Physical-Chemical Laboratories, initially established to carry out basic analyses in drinking and surface water samples, nowadays perform a great diversity of inorganic, aggregate organic and organic compounds analyses in different kinds of matrices, giving support for several of CETESB's activities, mainly for water quality monitoring programmes, chemical emergencies, contaminated area monitoring, control and licensing actions (and more recently for POPs monitoring in air samples). The list of compounds that is usually evaluated in routine work is based on Brazilian regulations for drinking, surface, ground and wastewater. Compounds like PCBs, PAHs, OCPs, some metals and more recently dioxins and furans are evaluated in sediment samples and aquatic organisms because of their potential to accumulate in these locations. Beyond the routine analyses, the laboratories develop new analytical methods, such as algae toxins analysis by liquid chromatography- tandem mass spectrometry LC-MS/MS and dioxin-like PCB analysis by gas chromatography – high resolution mass spectrometry GC-HRMS in several environmental matrices.

Currently the laboratory team is working to implement methods for emerging pollutants like PFOS and brominated flame retardants, agrochemicals frequently used in Brazil, and organometallic compounds like methylmercury. The main challenge for the chemistry laboratories is to increase the number of compounds to be monitored in the environment and also the requirement for very low detection limits that demands complex and expensive equipment.

It has been difficult to include new compounds in the list of compounds analysed in CETESB laboratories, especially for expensive analysis such as new POPs compounds. There has been reduction of costs and employees in the last years and currently there is an ongoing discussion on strategies for the future. Possibilities include a suggestion to stop monitoring old compounds that were already analysed in the State and already have an environmental diagnosis, and to stop offering services for compounds that have never been found nor have been registered for use in the State, such as Toxaphene.

PAPER:

02

PROPOSED CRITERIA

Background information

This paper will identify the main findings of the UNEP/GEF-funded projects GMP and the delivery of capacity building activities and will propose some criteria for a more effective GMP.

The objective of the UNEP/GEF GMP projects is to strengthen the monitoring capacity at national level and so to contribute with national data to the GMP. It includes the development of detailed guidelines, protocols and manuals as well as training of staff in participating laboratories and strengthening the performance of sampling and analysis with the aim to enable the national laboratories to have the infrastructure in place to analyse POPs according to international standards consistent with the Stockholm Convention GMP guidelines.

Summary of the UNEP/GEF projects GMP 1 and GMP 2

UNEP Chemicals and Health Branch has provided technical assistance for the analysis and monitoring to support the implementation of the POPs Convention, more specifically the Global Monitoring Plan on POPs.

Two rounds of projects were undertaken to pilot test the recommendations of the guidance document for the Global Monitoring Plan on POPs and two series of regional projects to support the implementation of the Global Monitoring Plan (GMP1 and GMP2 projects). The UNEP/GMP1 projects were implemented in 32 countries in Africa, Latin America and the Caribbean, and the Pacific Islands regions from 2009 to 2012 (see Table 1).

Region	Funding	Number of countries participated in UNEP/GEF GMP1
Pacific Project	GEF	8
West Africa Project		6
South-East Africa Project		6
GRULAC Project		8
GRULAC Project	SAICM Quick Start Project	4
Total		32

Table 1: Summary of participating countries for the GMP Phase 1

The GMP2 projects are presently implementing through four GEF-funded follow-up projects in 42 countries in Africa, Asia, the Pacific Islands and in Latin America and the Caribbean from 2016 to 2024.

Regions	Number of countries participated in GMP2
Africa Region	15
Asia Region	7
GRULAC Region	11
Pacific Region	2
Total	42

Table 2: Summary of participating countries for the GMP Phase 2

The UNEP inf document submitted to the COP.9 in 2019 on a sustainable monitoring of persistent organic pollutants (UNEP 2019) takes into consideration both GMP phase 1 and 2 and suggests that successful monitoring, both sampling and analysis of POPs, can be sustainable and high quality only if they are linked to a solid infrastructure and routine monitoring operations. Participating countries have noted some issues that impact effectiveness of the project work, including customs clearance procedures as a major challenge, with administrative support at national and international levels to facilitate addressing this challenge as crucial for sustainability.

Despite the training and capacity building programme on GMP, most countries participating in the project are still not in a position to perform the analysis domestically, with limited capacity to analyze dioxin-like POPs (PCDD/PCDF and PCB). The quality of dioxin analysis varies from “good” to “very good” (according to the GMP project report) but is restricted to a limited number of laboratories.

Newly listed POPs are a challenge, but the inter-laboratory assessment indicates that there are improvements. Air sampling and passive air sampling using polyurethane foam disks (PUF) was used in all project countries. The method is sensitive enough, robust and relatively simple to use, and has been successfully implemented in project countries. The same method is also used by other POPs monitoring projects or programmes (e.g. GAPS, MONET), which assists comparability.

Long-term data are available for some of them; however, not for all POPs and with varying sampling locations.

Enhancing laboratory capacity by training of technical staff during both rounds of the UNEP/GEF GMP projects featured training of experts as a main project component. Trainings held for the developing countries' laboratories were carried out by representatives of the expert laboratories. The training sessions comprised a theoretical part, a demonstration of sampling, sample preparation and clean up as well as laboratory analysis, including calculations, and quality assurance and quality control measures (QA/QC). While some trained laboratories have improved their analytical capacity, many of those trained are not regularly doing POPs analysis. Regular functions of some laboratories are different from analyzing POPs in the core matrices of the Stockholm Convention, so the samples for the analysis of POPs are only performed during the execution of projects or upon specific requests. Regular work on POPs is necessary for these laboratories to maintain the human resources and the equipment. It was also noted that many laboratories suffer from lack of interest and support by their respective governments or management to keep undertaking POPs analysis after the projects cease. Some also experience difficulties in procurement of equipment, availability of spare parts and retaining trained staff.

Effectiveness Evaluation Monitoring reports

As indicated in the Stockholm Convention website (Secretariat of the Stockholm Convention n.d.), monitoring reports are developed by regional organization groups (ROGs) and the global coordination group (GCG) to support periodic evaluations of the effectiveness of the Convention, which is to be undertaken by the Conference of the Parties. The GCG oversees the implementation of the global monitoring plan across the regions and the development of the global monitoring report which is mainly based on the regional reports. Annex to the Decision SC-8/19 includes the revised Terms of Reference and mandate of the regional organization and the Global Coordination Group (Secretariat of the Stockholm Convention n.d.).

The Guidance on the GMP for POPs (UNEP 2021), the GMP itself and the implementation of the global monitoring plan for effectiveness evaluation provide further details on the process for developing the monitoring reports. The Guidance was designed to include provisions on which POPs are to be considered, core and other matrices and time intervals between data collection campaigns among other (UNEP 2021).

The Implementation of the GMP on POPs lead the development of the global and regional global monitoring reports. The first and second regional monitoring reports were welcomed by the Conference of the Parties at its fourth and seventh meetings respectively (Stockholm Convention n.d.). While the first monitoring reports provide information on the baseline concentrations of the 12 legacy POPs, the second global monitoring report provides first indications as to the changes in concentrations of the chemicals initially listed in the Convention, as well as baseline information on the newly listed POPs (Table 3).

Changes in the scope of the Stockholm Convention over time		
12 initial POP	POPs listed since 2009	POPs listed since 2011
Aldrin	Chlordecone	Endosulfan
Chlordane	α -HCH	POPs listed since 2013
DDT	β -HCH	Hexabromocyclododecane (HBCD)
Dieldrin	γ -HCH	POPs listed since 2015
Endrin	Hexabromobipheny	Hexachlorobutadiene
HCB	Pentachlorobenzene	Pentachlorophenol, its salts and esters
Heptachlor	c-penta BDE	Polychlorinated naphthalenes (PCN)
Mirex	c-octa BDE	
Polychlorinated biphenyls (PCBs)	PFOS	
Polychlorinated dibenzo-p-dioxins (PCDDs)		
Polychlorinated dibenzofurans (PCDFs)		
Toxaphene		

Table 3: List of POPs (source: Guidance on Global Monitoring Plan for Persistent Organic Pollutants)

First Global Monitoring report - Findings

The Conference of the Parties (COP) completed its first effectiveness evaluation at its fourth meeting COP.4 in 2009 based on the first Global Monitoring Report (Secretariat of the Stockholm Convention n.d.). Among other things, the report stresses the **limited data available** and **constrained capacity for sustained monitoring** in regions.

The main findings of the report make clear reference to the following:

1. Baseline levels of POPs: results come from a relatively small number of existing national and international programmes. Existing programmes should continue while new programmes should be transformed into sustainable long-term programmes.
2. Identified gaps and capacity building: Long-term monitoring programmes are lacking in most sub-regions and entire continents. There is some analytical capacity in countries and with some degree of national commitment, targeted training and upgrading laboratories could be brought up to standard to serve the GMP.
3. Interval for future evaluations: six-years should be enough to accumulate substantive information. A reduced period would not be cost effective while a longer period would restrict information available to the COPs.
4. Media: Ambient air and human milk or blood are suitable media to evaluate changes in POPs levels over time. These should be maintained
5. Data comparability: Data comparability is key for interpreting levels of POPs over time. Efforts should focus on enhancing data comparability.
6. Long-range transport of POPs: future evaluations of changes in POPs levels should include information on regional and global environmental transport.
7. Future programmes: The initial focus of any capacity building should be to establish a continuous monitoring programme, that at least in the case of air monitoring, focuses on a small number of sampling sites to produce the data needed. Once such a programme is sustainable, adding more sampling points could be considered.
8. Impediments to the implementation of the GMP: some data are not completed or available yet because of lack of resources or delays in implementing the projects. Those delays can be attributed to difficulties in communications and occasionally lack of response to or unwillingness to participate in initiatives.

Second Global Monitoring report - Findings

In 2017, COP.8 adopted the framework for the effectiveness evaluation. Decision SC-8-19 on the Global Monitoring Plan for effectiveness evaluation welcomed the second global monitoring report and engaged in the implementation of the GMP and the effectiveness evaluation. In particular, this represented the continuation of the monitoring activities for core media (air, breast milk or human blood and water, for those Parties who are in a position to initiate monitoring of perfluoro octane sulfonate) and to support the further development and long-term implementation of the global monitoring plan.

The second Global Monitoring Report was provided at COP.7 in 2015 and is one of the pillars of the effectiveness evaluation efforts made by the Convention. Among other things, the report stressed the need to continue the global monitoring plan, implementation plan and guidance document as its foundation. Additionally, the report recommends ensuring sustainability of ongoing monitoring activities in the long-term and to ensure comparability and consistency in monitoring data. The main findings and recommendations of the report regarding capacity building make reference to the following:

1. Further capacity building and training is needed for sample collection and analysis.
2. There is need to further strengthen regional communication and information exchange structures to enhance information sharing among regional organizations.
3. GMP should be sustained in the long-term in order to produce reliable data and projections.
4. Data quality, consistency and comparability is key to assess temporal trends and laboratories in programmes contributing to monitoring data to the GMP should participate in international interlaboratory assessments.

Proposed criteria for a sustainable GMP

The UNEP report on sustainable monitoring of POPs (UNEP 2019) highlights the challenges faced by countries and partners that would prevent GMP from being more effective. Additionally, the GMP reports (Secretariat of the Stockholm Convention n.d.) highlight the need for a sustained GMP programme and capacity building activities. Based on those findings, we conclude that business as usual is not an option and that a more focused criteria could be considered to have a more successful and sustained GMP Programme.

The new approach for a more sustainable GMP includes a programme with selected countries (which can demonstrate real engagement to the GMP) to participate in the sampling and very few laboratories per region to participate in the analytical training and to lead the analysis. Below are a few considerations:

National Regional and Capacity Assessment

The UNEP/GEF GMP activities has been open to all countries willing to participate. However, it is common to see differences in national infrastructure and technical capacity within regions to respond properly to the activities in a timely and effective manner.

Conducting a regional and national capacity assessment will allow identification of which countries can effectively participate in the UNEP/GEF GMP programme. Preference should be given to those that are already part of the programme.

Usually, this assessment is performed using questionnaires and reviewing the performance of countries in the UNEP/GEF GMP activities. Regarding the analytical capacity, updating the UNEP database on laboratories capacities and the four rounds of interlaboratory assessments (UNEP 2023) could also be considered as a first step. The following considerations could assist with the assessment:

1. Which country can participate in the programme in which core media and for which POPs
2. Which countries could lead the analysis of POPs in the region, has the national laboratory shown interest in participating in the GMP?
3. For countries already participating in the UNEP/GEF GMP, analyse the performance of existing national programme, what are the main challenges and if those challenges can be sorted out. Are the existing monitoring sites producing data? Are they well maintained?
4. Are the trained technicians part of the core staff of the institution? Is there gender parity amongst the trained technicians?
5. High political support to participate in the monitoring programme

Training needs assessment

Following the national and regional capacity assessment, it is advisable to prepare a regional plan indicating which country does what in terms of sampling or analysis, matrices and type of POPs to be addressed. This will identify the different groups to be trained in the country and the areas in which each group needs to be trained. Additionally, efforts can be made to promote and monitor gender parity amongst participants.

This training needs assessment will produce a training needs report as part of the GMP plan for the region.

Global and regional training plan

This training plan (which could be used as a basis for the GMP implementation plan) will guide the activities of the GMP in the regions. The plan is to be agreed by the country and regional groups.

Data generation plan – update GMP reporting plan

Concerning the analysis of POPs, in order to qualify as a lead laboratory for the region, it would be advisable to comply with the following criteria:

1. Good infrastructure for the analysis of POPs
2. Development of a business plan to ensure the laboratory will continue to operate in general, and thus have the resources to perform POPs analysis in the next years
3. Presence of qualified technicians, which can also be trained on POPs analysis
4. A country's customs authority can receive and dispatch to the lab samples and equipment without delays – agreement between the lab and the customs could be advisable

Lead laboratories in the region would likely receive training and would be constantly assessed to further enhance their performance.

Conclusions

The UNEP/GEF POPs monitoring programme can be substantially enhanced and made more effective by focusing its capacity building activities on a smaller but committed number of stakeholders and countries. As recommended in the First Global report of the GMP, a step-by-step approach can be used, where the smaller GMP group can ensure that the programme is sustainable and then opening to new members.

In the last years, there has been significant efforts to train more and more national laboratories and staff without a significant impact in the results of the GMP. In many cases, the provision of data has suffered significant delays. Efforts have also been made to remedy these situations and to have a higher level of response from partners: this has not had much success. Ensuring both women and men are included in capacity building efforts is important and in alignment with the SDGs as well as the mandates of the BRS, UNEP and GEF.

As resources become scarce, the GMP programme is forced to change its way of working and become more efficient. A GMP with a greater focus on a training component can be instrumental in the years to come and can also support sustainability. Identifying fewer committed countries in each region (whose governments express support to the GMP and that have been recommended in the national capacity assessment) and providing training to fewer qualified laboratories in regions, can be used as a basis for a more sustainable GMP plan.



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PAPER:

03

FINANCIAL RECOMMENDATIONS



Background information

Article 16 of the Stockholm Convention stipulates that the effectiveness of the Convention shall be evaluated four years after the date of entry into force (17 May 2004) of the Convention and periodically thereafter. The Effectiveness Evaluation includes the GMP, which provide a framework for monitoring the presence of POPs in the environment and in humans and suggests that such monitoring and subsequent assessment should be undertaken on a regional basis. One of the objectives of the GMP is to assess the regional and global transport of POPs and presence in humans and the environment, and to support the effectiveness evaluation process of the Stockholm Convention. The GMP focused initially on the core media of blood and mothers' milk to examine human exposure, ambient air to examine long-range transport, and water (only for PFAS).

The GMP under the Stockholm Convention on POPs is a plan that enables collection of comparable monitoring data from all regions of the world to assess the effectiveness of the Stockholm Convention in minimizing human and environmental exposure to POPs. The GMP leads the development of the global and regional global monitoring reports. The first and second regional monitoring reports were welcomed by the Conference of the Parties at its fourth meeting in 2009 and seventh meeting in 2015 respectively (Secretariat of the Stockholm Convention n.d.). While the first monitoring reports provided information on the baseline concentrations of the 12 initial POPs, the second global monitoring report provided first indications as to the changes in concentrations of the initially listed POPs, as well as baseline information on the newly listed POPs.

The COP completed its first effectiveness evaluation at COP.4 in 2009, based on the first Global Monitoring Report. Among other elements, the report stresses the **limited data available** and **constrained capacity for sustained monitoring** in regions.

COP.4 also agreed upon the essential modalities for the environmental monitoring component of the subsequent evaluations and included nine new chemicals in the POPs list (Decision SC-4/10-18; Annexes A, B, and C) and during COP.5 added endosulfan as a POP to be listed in Annex A (Decision SC-5/3).

The second Global Monitoring Report was provided at COP.7 in 2015 and is one the pillars of the effectiveness evaluation efforts from the Convention.

The objective of the effectiveness evaluation is to assess whether the Stockholm Convention is an effective tool to protect human health and the environment from POPs. In practice, this happens through evaluating whether:

- Releases from intentional production and use are eliminated or reduced;
- Releases from unintentional production are eliminated or reduced;
- Releases from stockpiles and wastes are eliminated or reduced; and
- Environmental levels of POPs are decreasing over time

In 2017, COP.8 adopted the framework for the effectiveness evaluation. Decision SC-8-19 welcomed the second global monitoring report and engaged in the implementation of the Global Monitoring Plan and the effectiveness evaluation. In particular, this represented the continuation of the monitoring activities for core media (air, breast milk, human blood and water) and an encouragement, for those Parties who are in a position to do so, to initiate monitoring of perfluorooctane sulfonate, and to support the further development and long-term implementation of the global monitoring plan.

Data and information collection, including capacity-enhancement activities and the development of regional monitoring reports, is under the responsibility of regional organization groups in each of the five UN Regions. A global coordination group oversees the implementation of the global monitoring plan across the regions and the development of the global monitoring report. The annex to the Decision SC-8/19 includes the revised Terms of Reference and mandate of the regional organization and the Global Coordination Group.

A Guidance document on the global monitoring plan is also available to support comparability and consistency in monitoring results, including guidelines for collection, analysis and reporting of information and data (UNEP and Secretariat of the Stockholm Convention 2021). The guidance also includes information on the sampling and analysis of the newly listed POPs and, together with the implementation plan, sets the basis for implementing harmonized monitoring under the global monitoring plan.

If Parties to the Convention, developing countries are eligible for GEF funds to strengthen the monitoring capacity at the national level and to contribute with national data to the GMP. Two sets of GEF projects to support the implementation of the GMP were implemented. These projects enabled provision of quality data on human exposure and environmental concentration of the POPs included for the effectiveness evaluation.

Financial support to the GMP

The below considerations should be taken into account when discussing financial issues for sustainability of the GMP.

Global Environment Facility (GEF)

Article 13, paragraph 6, of the Stockholm Convention indicates that “a mechanism for the provision of adequate and sustainable financial resources to developing country Parties and Parties with economies in transition on a grant or concessional basis to assist in their implementation of the Convention is hereby defined. The mechanism shall function under the authority, as appropriate, and guidance of, and accountable to the Conference of the Parties for the purposes of the Convention”.

Article 14 of the Convention established the interim financial arrangements, assigning the Global Environment Facility to be the principal entity entrusted with the operations of the financial mechanism referred to in Article 13.

There are a number of Articles in the Stockholm Convention that support the development and implementation of the GMP:

- Article 13 of the Convention makes reference to “assist in their [the developing country Parties and Parties with economies in transition] implementation of the Convention”.
- Article 10 refers to Public information, awareness and education
- Article 11 under research, development and monitoring encourages Parties to undertake appropriate research, development, monitoring and cooperation including (d) effects on human health and the environment.
- Article 12 refers to technical assistance
- Article 16 refers to effectiveness evaluation.

While the GEF has a key role to play in the further implementation of the Convention generally, as indicated in article 13, the COPs should guide the Financial Mechanism to address GMP as a priority area. Key Parties may be engaged in this matter, to ensure the GMP retains its priority status and associated guidance is given to the GEF.

The GMP projects have been largely supported by the Global Environment Facility (see Table 4). These projects also involved a significant amount of co-finance from different partners.

GEF ID	Project title	GEF replenishment period	GEF contribution USD	Co-finance USD
6978	Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Pacific Region	GEF-6	1,995,000	6,448,604
4886	Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Africa Region	GEF-5	4,208,000	10,190,200
4894	Implementation of the POPs Monitoring Plan in the Asian region	GEE-5	3,936,000	13,164,900
4881	Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention in the Latin American and Caribbean Region	GEF-5	3,636,000	13,375,401
4412	Establishing the tools and methods to include the nine new POPs into the Global Monitoring Plan	GEF-5	700,000	1,516,340
3778	"Supporting the Implementation of the Global Monitoring Plan of POPs in Latin America and"	G E F-4	845,000	845,300
3674	Supporting the Implementation of the Global Monitoring Plan of POPs in West Africa	GEF-4	583,000	610,600
3673	"Supporting the Implementation of the Global Monitoring Plan of POPs in Eastern and Southern African Countries"	GEF-4	484,000	521,250
3663	PAS: Supporting the POPs Global Monitoring Plan in the Pacific Islands Region	GEF-4	517,000	534,000
TOTAL			16,904,000	47,206,595

Table 4: Summary of GEF contributions on global monitoring of POPs from 2008 to 2024

Funding for the GMP programme started in 2009 during the 4th GEF replenishment period (2006-2010) and has since further received funding from the GEF during the 5th and 6th replenishment periods. The GEF replenishment period 7 is going up to 2022. The GEF, as the financial mechanism to the Stockholm Convention, has provided/allocated from 2004 to date (2019) a total of 1.5 billion USD for the implementation of the POPs Convention. The wider Chemicals and Waste GEF Focal area (which includes allocations for POPs, Ozone, mercury and SAICM-related activities) has made available some 2 billion USD (See Table 5).

Replenishment Period	POPs	Ozone	mercury	GEF and the Global Monitoring Plan The GMP on POPs has received from GEF 12.97MM USD, which represents only 1.11% of the total GEF allocations for POPs from replenishments 4 to 7.
GEF-4 (2006-2010)	375	0	0	
GEF-5 (2010-2014)	375	25	25	
GEF-6 (2014-2018)	375	25	141	
GEF-7 (2018-2022)	392	25	225	
TOTAL	1517	75	391	

Table 5: Summary of GEF replenishment periods, and allocations/available funds for the Chemicals and Waste Focal Area

National and international contributions

Article 13 of the Stockholm Convention also indicates that “developed country Parties, and other Parties in accordance with their national plans, priorities and programmes, may also provide and developing country Parties and Parties with economies in transition avail themselves of financial resources to assist in their implementation of this Convention through other bilateral, regional and multilateral sources or channels”. Furthermore, the same article also indicates that “the developed country Parties shall provide new and additional financial resources to enable developing country Parties and Parties with economies in transition to meet agreed full incremental costs of implementing measures which fulfill their obligations under this Convention”.

As indicated in the previous sections (and see Table 4), the GMP projects have included a co-finance component. For practical purposes, this paper has summarized the co-finance provided per groups of stakeholders and per project (see Table 6).

GEF ID	National Governments	GEF Agency	IGOs	Academic Institutions	Other (regional + bilateral)	TOTAL USD
6978	2,300,000	200,000	100,000	3,770,100	78,504	6,448,604
4886	8,250,000	200,000	455,000	1,285,200		10,190,200
4894	6,218,900	200,000	295,000	6,451,000		13,164,900
4881	10,425,201	200,000	455,000	2,295,200		13,375,401
4412	336,000	77,000	1,053,340		50,000	1,516,340
3778	466,000	155,000	150,300		74,000	845,300
3674	266,000	45,000	130,600	20,000	149,000	610,600
3673	199,000	37,000	120,250	20,000	145,000	521,250
3663	320,000	50,000	34,000	10,000	120,000	534,000
TOTAL	28,781,101	1,164,000	2,793,490	13,851,500	616,504	47,206,595

Table 6: Summary of co-finance provided and/or committed to GEF projects by different stakeholders.

National Governments refers to government institutions making contributions to the GMP. National Governments are by far the largest contributors to the co-finance provided for the GMP Programme. The Academic Institutions (some of them having taken part in the execution of the project) also provide a significant financial contribution to the Programme. These two blocks of contributions imply that the GMP is also considered as an important element of POPs’ management in those countries and regions. However, it is not clear if this support is provided by different sectors in the country or only by the Ministry of Environment and/or Health.

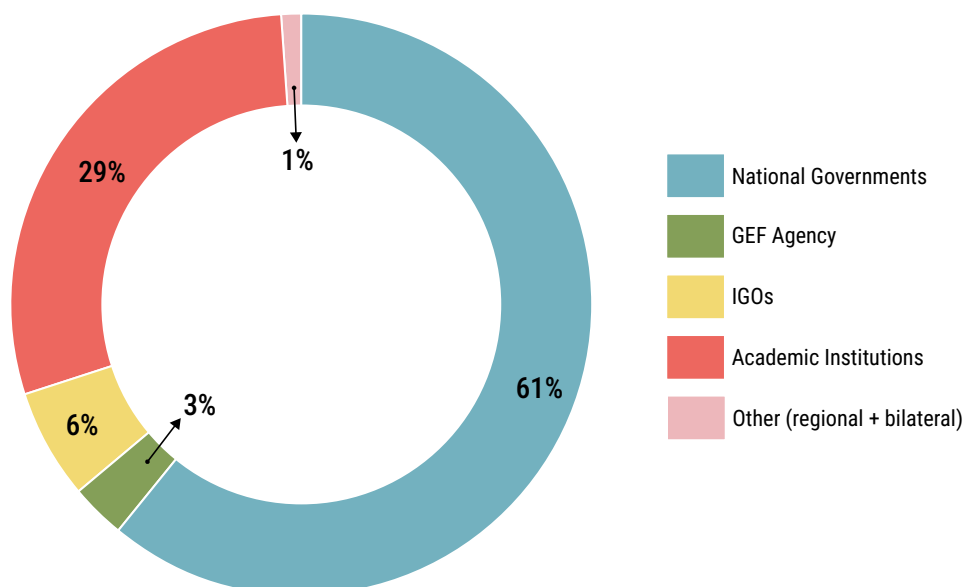


Figure 6: Distribution of co-finance provided to GEF projects by different stakeholder

The level of co-finance provided by countries needs to be assessed in detail and see if the core functions of the GMP are being supported by national or international partners (not GEF). It is important to recognize that the GEF funding is to cover the incremental cost of the GMP: “The GEF funds the “incremental” or additional costs associated with transforming a project with national benefits into one with global environmental benefits; for example, choosing solar energy technology over coal or diesel fuel meets the same national development goal (power generation), but is more costly” (Global Environmental Facility [GEF] 2007).

A close look at the co-finance provided indicates that only 10.9% of the co-finance is provided as “cash” and 89.1% is provided as “in-kind” (see Table 7).

GEF ID	Cash	In-kind	TOTAL
6978	25,000	6,423,604	6,448,604
4886	25,000	10,165,200	10,190,200
4894	25,000	13,139,900	13,164,900
4881	2,065,585	11,309,816	13,375,401
4412	755,000	761,340	1,516,340
3778	252,300	593,000	845,300
3674	220,600	390,000	610,600
3673	230,250	291,000	521,250
3663	134,000	400,000	534,000
TOTAL	3,732,735	43,473,860	47,206,595

Table 7: Cash and in-kind co-finance committed and/or provided.

The GEF Co-Financing Guidelines define in-kind contributions as “contributions in the form of goods or services other than money, including but not limited to salaries and wages, office space, and utilities”. However, it is important to mention that partners may have different interpretations of the types of co-finance and this might have influenced the identification of co-finance resources when the proposals were submitted.

Sustainability of the UNEP/GEF GMP – Recommendations

Based on a preliminary assessment, the most relevant gaps of the GMP are the lack of sustainable and predictable financing to develop a system that can substantially contribute to the effectiveness evaluation of the Stockholm Convention. The GEF has been crucial to initiate and continue the GMP programme and most activities under the programme have been performed as a consequence of available funding and not as core operations of government institutions.

Access to scientific data and knowledge is becoming increasingly critical in understanding the mechanisms and processes of environmental problems of collective actions. As such, the GMP Programme has a clear value in providing data for the Effectiveness Evaluation of the Stockholm Convention and to identify priority areas for actions at the national and regional level.

Any sustainability model would need to consider the economic, social and environmental aspects, including the gender dimension both in terms of participation in capacity building efforts as well as in relation to gender-differentiated impacts of exposures to POPs. The GMP sustainable model proposed below relies on scientific data/information and how this can be communicated to citizens. These elements are the pillars of secure financing for the GMP programme in future years.

Prioritizing the GMP on POPs at the national and regional level would imply strengthening overall national POPs management to enable the establishment of evidence-based policymaking processes in parallel with an effective and constant evaluation of current regulations on POPs. Additionally, in order to contribute effectively to the global efforts to comply with Article 16 of the POPs Convention on Effectiveness Evaluation, it is suggested to establish regional and sub-regional POPs monitoring networks and joint programmes to share capacity. Furthermore, it is essential to connect the private and public sectors within the countries and regions.

The GMP project has started with some of the proposed actions, however external funding is still needed in order to create a more solid basis for an effective GMP Programme. Below are two suggested models to ensure a sustainable GMP is further developed.

GEF supporting the GMP work through the NIP updating process

Article 7 of the Stockholm Convention requests Parties to submit their National Implementation Plans (NIPs) within two years of the date on which the Convention enters into force and to review and update, as appropriate, on a periodic basis and in a manner to be specified by a decision of the Conference of the Parties.

Currently, the 2017 updated version of the “Guidance for Developing a national Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants” (Secretariat of the Stockholm Convention 2017), in its Annex I include the Assessment of the different POPs, however it does not include a direct reference to the national efforts to contribute to the Global/ Regional Monitoring report. Annex 11 of the guidance entitled “Notes on Socio-economic Assessment” links aspects of the GMP with socio-economic aspects, such as impact on human health and economic aspects of human life. The same guidance in Chapter 10 recommends elements for consideration in the outline of NIPs and requests countries to develop an action plan, including respective activities and strategies, on Effectiveness Evaluation (Article 16).

Doing a review of the NIPs submitted and available, most NIPs do not present any data or information that could potentially contribute to the development of the Effectiveness Evaluation strategy. It is also understood that the focus of the GMP is to contribute to the regional monitoring reports, not as individual national reports. However, producing a regional report and compile data at a regional level requires the input and data from a range of countries.

Building up POPs monitoring activities as part of the NIP would imply actions as follows:

1. **Include a specific chapter on POPs monitoring in humans and the environment** as part of the Guidance for NIP development, including gender- and age-differentiated impacts. This action might require approval from the COP.
2. **Harmonize timing and set periodicity of NIP updating**, allowing harmonized and comparable data. As the GMP needs to produce reports periodically at specific intervals. It might also require a decision from the COP.
3. **Include GMP activities** (calculated at XX% of the total amount requested) as one component of NIP development/ updating proposals to be submitted to GEF. This might also require approval from the COP.

GEF to continue supporting the GMP and allocate funding at each replenishment period

To date, the GEF has funded two phases of projects under the Global Monitoring Plan. These projects have provided data to the Regional and Global Monitoring Reports 1 and 2. It is important to mention that the document entitled: “GEF-7 Replenishment, Programming Directions” indicates in Programme 4 (Chemicals and Waste Focal Area) on Enabling Activities, paragraph 246 that GEF will support the “global monitoring of chemicals, related to the effectiveness evaluation under the Chemicals Conventions”.

While the GEF-7 Programming Directions document provides the justification to apply once more for funding to GEF, it does not give the assurance of sustainable funding for the years to come. As noted previously, the GMP is an integral part of the Convention, and links to several articles. Monitoring the presence of POPs can also be a sig-

nificant contributor to the Sustainable Development Goals, such as 3.9 (By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination) and 12.4 (By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment). Monitoring levels of POPs can be a key element in a communication strategy in showcasing the benefits of the Stockholm Convention. Highlighting the prominence within the Convention and as part of the 2030 Agenda for Sustainable Development may serve to ensure political attention is maintained on the GMP. Additionally, adopting approaches that integrate a gender dimension as recommended by UNEP, GEF and the BRS would beneficially contribute towards SDG 5.

Discussing a GMP allocation for GEF7 and beyond would require preparation and presentation of the right arguments and justifications:

1. **Prepare a working document for the next COP** (COP.10 in 2021) to inform Parties of the needs for sustainability of the GMP Programme and role of GEF. By developing such a document and encouraging discussion at the COP, the prominence and importance of the GMP can be re-emphasized. **Submission times of such a document will need to be taken into account.**
2. After recognition by the COP, **engage the Executive Secretary of the Stockholm Convention to discuss with the GEF CEO** the possibility to have an allocation, in each GEF replenishment, to support the Programme on Effectiveness Evaluation component of the Convention, particularly the efforts under the GMP Programme. The GMP is already fully justified and perfectly fits the definition and criteria for GEF support.



Elements to consider when discussing sustainability

GMP Partners, including the GEF, are likely to support activities that are to be sustained overtime and that have a high degree of national or regional ownership and support (technical and political). During the discussion with potential donors, including the GEF, it is important to consider elements for sustainability of the GMP:

1. Vision	what we want the GMP to be in the future, based on its goals and aspirations. It is important to relate them to SDGs and future initiatives.
2. Expected Results	what results we want to obtain from the GMP and how our actions are oriented to those results
3. Outreach Strategy	how to communicate the results to the audience and what are the different target audiences, are the GMP results communicated effectively
4. Strategic Financing	how the GMP efforts can be financially sustained in a predictable and systematic manner
5. Partners	how can new partners and contributors be engaged. Should monitoring of POPs for the Convention be confined to projects under the GMP, or can international scientific resources contribute more significantly to the knowledge base
6. Adaptability to changing conditions and self-evaluation	how new POPs can be incorporated into the GMP, what political drivers in countries and institutions will push the GMP to adapt to the new conditions. how to improve effectiveness in the GMP programme.
7. COP support	how much do Parties know about GMP, how important it is for them and their national governments, and how high is it prioritized within the Convention
8. Key champions	which Parties can lead the way in their regions
9. Coordination systems	what roles are assigned to GMP coordination and implementation partners and how effective is it
10. Action plan to sustain GMP for the next 10 years	Sustainability plan: an action plan for the GMP in the next years, what is envisaged, including where applicable, consideration of gender and social assessments.

Table 8: 10 elements to consider when discussing sustainability

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United Nations Avenue, Gigiri
P O Box 30552, 00100 Nairobi, Kenya
Tel +254 720 200200
unep-info@un.org
www.unep.org

