Meeting Report on the Africa Regional Workshop on development of national Persistent Organic Pollutants (POPs) inventories for National Implementation Plans (NIPs) under the Stockholm Convention

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Common Abbreviations

Chemicals and Pollutants

POPs	Persistent Organic Pollutants
PCBs	Polychlorinated Biphenyls
DDT	Dichlorodiphenyltrichloroethane
HCB	Hexachlorobenzene
PBDEs	Polybrominated Diphenyl Ethers
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonic Acid
PFAS	Perfluoroalkyl Substances
HCH	Hexachlorocyclohexane
TCDD	Tetrachlorodibenzo-p-dioxin (a dioxin)
PCDDs	Polychlorinated Dibenzo-p-Dioxins
PCDFs	Polychlorinated Dibenzofurans

Treaty and Governance Terms

COP	Conference of the Parties
BAT	Best Available Techniques
BEP	Best Environmental Practices
GEF	Global Environment Facility
SC	Stockholm Convention
BRS	Basel, Rotterdam, and Stockholm Conventions (joint reference)
SCRC	Stockholm Convention Regional Centre
TRP	Thematic Research Programme

Regulatory and Management Concepts

NIP	National Implementation Plan
POPRC	Persistent Organic Pollutants Review Committee
ELVs	Emission Limit Values
TACs	Total Allowable Concentration

Executive Summary

The Africa Regional Workshop on development of national Persistent Organic Pollutants (POPs) inventories for National Implementation Plans (NIPs) under the Stockholm Convention, held from November 26-28, 2024, in Nairobi, Kenya, brought together participants from across Africa and Europe to enhance national capacities for developing and updating National Implementation Plans (NIPs) under the Stockholm Convention. This event was a collaborative effort between the Stockholm Convention Regional Centre (SCRC) at *icipe*, the United Nations Environment Programme (UNEP), and other global partners.

The workshop aimed at:

1. Build capacity in inventory development for newly listed Persistent Organic Pollutants (POPs).
2. Enhance understanding of reporting obligations under the Stockholm Convention.
3. Explore synergies between chemicals, plastics, and waste management initiatives.
4. Disseminate guidance for sustainable management practices.

The participants engaged in:

- Sector-specific inventory development, including e-waste, transport, and construction.
- Practical exercises using tools like the UN Comtrade Database.
- Discussions on challenges and strategies for managing POPs, including emerging pollutants like PFAS and UV-328.
- Knowledge sharing on sustainable waste management practices, including pilot projects from Ghana and South Africa.

Major Findings

1. Significant quantities of POPs are present in African e-waste, end-of-life vehicles, and construction/demolition materials, necessitating robust management strategies.
2. Developing countries face technical and financial barriers to meeting reporting and waste management standards.
3. There is a critical need for regional collaboration and capacity-building to address the gaps in monitoring and managing POPs.

Recommendations

1. Establish sustainable waste management systems, leveraging successful pilot projects.
2. Strengthen extended producer responsibility frameworks and economic incentives.
3. Expand capacity-building initiatives to promote effective inventory and waste management practices.
4. Enhance international collaboration for technology transfer and financial support.

Conclusion

The workshop underscored the importance of harmonized efforts to manage POPs effectively, aligning with the Stockholm Convention's goals of protecting human health and the environment. It concluded with actionable commitments by participants to advance national and regional strategies for POPs management.

Background

The United Nations Environment Programme (UNEP) assists countries in reviewing and updating their National Implementation Plans (NIPs) in order to comply with reporting obligations (Article 15) and updating of National Implementation Plans (Article 7) under the Stockholm Convention. Developing the inventories of POPs, as listed by the Conference of the Parties (COP) to the Stockholm Convention at its 2022 and 2023 meetings, is a key step towards the update of National Implementation Plans. There is an urgent need to build the capacity of parties to the Stockholm Convention, particularly developing countries, and countries with economies in transition, in aspects such as: inventory development of POPs, updating of NIPs, enhancing the understanding of the reporting obligations of the parties, and undertaking proper reporting. In this regard, a small scale funding agreement (SSFA) (reference number: BRS-SSFA-2452) to implement the project "Supporting inventories development and priority setting as part of the process to develop, review and update National Implementation Plans (NIPs) for POPs listed after the entry into force of the Stockholm Convention, and to enhance understanding of the reporting obligations of the Parties to the convention" was signed between the Secretariat of the Stockholm Convention, on Persistent Organic Pollutants - POPs (SSC/UNEP) and the Stockholm Convention Regional Centre in Kenya (SCRC Kenya) hosted by the International Centre of Insect Physiology and Ecology (*icipe*) was signed on 9th August 2024, with the following objectives:

i. To enhance the capacity of the Parties to the Stockholm Convention, particularly developing countries, and countries with economies in transition, in connection with the review and update of their NIPs;
ii. To enhance the capacity of the Parties to the Stockholm Convention on developing the inventories of POPs, as listed by the Conference of the Parties (COP) to the Stockholm Convention at its 2022 and 2023 meetings, and on national priority setting as part of the review and of the updating of NIPs;
iii. To disseminate the inventory guidance developed for the POPs, as listed by the COP in 2022 and 2023, and the step-by-step method on how to use the guidance including through an inventory pilot project;
iv. To enhance understanding of the reporting obligations of the Parties to the Stockholm Convention and to understand the key elements for "good reporting" (e.g., legislation, data collection, national coordination, among others);
v. To explore linkages between reporting under the convention and to learn about some related subjects to reporting (e.g., electronic approaches, NIPs, SDGs).

This effort was further strengthened with a complimentary small scale funding agreement with UNEP/GGKP (SSFA/2024/8217) with the goal to develop an educational program and training materials for the African Regional workshop on the development of national POPs inventories for NIPS under the Stockholm Convention. The additional funding targeted capacity building to the parties from selected African countries (Burundi, Cameroon, Cote d'Ivoire, Gambia, Tunisia, Togo, Senegal, Seychelles, Uganda, South Africa, and Guinea).

To achieve the above objectives, a 3-day training workshop was organized in Nairobi, Kenya, from the 26th to the 28th of November 2024. Nomination of participants from various target countries was undertaken and approved, travel logistics (air tickets, terminal expenses, and daily subsistence allowance (DSA) for the participants were also organized, entry visas were facilitated in liaison with the host country ministries. Consultancy agreements with relevant experts and resource personnel to deliver the training to the participants were established. Dr. Roland Weber of the POPs Environmental Consulting, Germany, kindly accepted the invitation to come and deliver technical guidance and assistance in developing and training parties on NIPs.

A report on the workshop is as follows below:

Workshop Report

Day 1 - Tuesday, 26 November 2024

Opening Remarks

The meeting commenced with a warm welcome extended to all participants by Ms. Annah Njui, *icipe*'s Grants, Partnerships & Projects Manager. A total of 35 participants from Africa and Europe were in attendance. Ms. Njui notified the group that there were translation services available from English to French and vice versa. She then invited Mr. Edward Njuguna, representative and participant from the Kenya's Ministry of Environment, Climate Change, and Forestry to give his introductory remarks and welcome the participants.
Mr. Njuguna welcomed participants to the workshop to support inventory development and priority setting in developingand updating National Implementation Plans (NIPs) under the Stockholm Convention. He thanked the organizers and emphasized the importance of protecting human health and the environment. He emphasized Kenya's support for the Convention, which aims to reduce persistent organic pollutants (POPs) that threaten global health, ecosystems, and biodiversity. He also stressed the need for collaboration and collective action to address knowledge, resources, and capacity gaps, particularly in developing countries. This workshop, he explained, was an opportunity to share insights and develop solutions for overcoming these challenges and strengthening the implementation of the Stockholm Convention. Mr. Njuguna called for a focus not only on identifying issues but also on moving forward with decisive action. He reaffirmed Kenya's commitment to the Convention and encouraged all stakeholders to work together to ensure progress and a sustainable future for all. He concluded by expressing gratitude to the organizers and participants and urging everyone to seize the opportunity to make meaningful progress in protecting human health and the environment.

Following this, Dr. Subramanian Sevgan, *icipe* Head, Environment and Biodiversity Thematic Research Programme (TRP) and *icipe* SCRC Coordinator, gave the opening speech on behalf of *icipe*'s Director General, Dr. Abdou Tenkouano. Dr. Sevgan reiterated the primary goal of the workshop: to develop, review, and update National Implementation Plans (NIPs) under the Stockholm Convention. He acknowledged the support of various Ministries of Environment across countries in advancing SC objectives. Dr. Sevgan also extended appreciation to the BRS Secretariat for organizing and supporting the workshop. He highlighted that the Stockholm Convention Regional Centre in Kenya (SCRC-Kenya) is hosted by the International Centre of Insect Physiology and Ecology (*ICIPE*) in Nairobi. Dr. Sevgan noted some of *icipe*'s successful initiatives that have significantly reduced reliance on chemical-based pesticides. These include the 'Push–Pull' habitat management strategy and the development and promotion of biopesticides.

Thereafter, the UN/BRS Secretariat Programme Management Officer, Mr. Suman Sharma, gave his remarks. He welcomed the participants on behalf of the Secretariat and extended his gratitude to Sweden and the EU for their financial support. He also thanked *icipe* for hosting the workshop and UNEP for the logistical backing. Mr. Sharma commended Dr. Weber for his acceptance to come and deliver technical guidance and assistance in developing and training parties on NIPs. He concluded by reaffirming the BRS Secretariat's commitment to supporting the parties in achieving the objectives of the Stockholm Convention. Mr. Sharma also registered his acknowledgment for support to the workshop by highlighting the critical role of various organizations in supporting the implementation of the Stockholm Convention, including:

- Global organizations: UNEP, GEF, WHO, UNIDO, and FAO;
- Regional organizations: African Union (AU), Regional Economic Communities (RECs), and the African Stockpiles Programme (ASP);
- Bilateral and multilateral partners: European Union (EU), SIDA, and USAID
- Non-Governmental Organizations (NGOs)

Following the welcome addresses, the participants introduced themselves, including government representatives and focal points for the Stockholm Convention. These representatives are primarily responsible for coordinating NIPs within their respective countries. The workshop also included online participants, who similarly introduced themselves virtually. The meeting set a collaborative tone, underscoring the importance of joint efforts in addressing persistent organic pollutants under the Stockholm Convention's framework. Mr Sharma outlined the objectives of the workshop as per below:

i. To enhance understanding on the scope and obligations to update and review the NIPs
ii. To provide information and disseminate NIP guidance documents on POPs
iii. To encourage parties to make effective use of the guidance documents and other training tools when updating the NIPs considering the newly listed POPs
iv. To provide an opportunity for parties to network with agencies involved in developing updating and implementing NIP including post-NIP projects

NIP Development and Implementation: An Opportunity to Promote Synergies on Chemicals, Plastic & Waste Management at the National Level

Dr. Weber introduced the participants to the topic '*NIPs Development, Review, and Updating,'* stating that National Implementation Plans (NIPs) development and implementation under the Stockholm Convention offers a unique opportunity to integrate and harmonize strategies for managing chemicals, plastics, and waste at the national level. By addressing persistent organic pollutants (POPs), NIPs serve as a framework to align policies, strengthen institutional capacities, and foster collaboration across various sectors. This process promotes synergies between environmental, health, and economic goals by enabling countries to adopt holistic approaches to managing hazardous substances and waste streams. Such integration not only ensures compliance with international obligations but also enhances resource efficiency, reduces environmental pollution, and supports sustainable development objectives. He stated that 34 POPs have been listed on the SC, 2024. Professor Scheringer assessed a chemical database with 100,000 chemicals on POPs properties and discovered 574 potential POPs meeting the criteria of Annex D. In another assessment by Wang et al. (2020) estimated that 350,000 chemicals are produced, used, and have been registered worldwide. Therefore, the global framework on chemicals have recently been established.
Electronics, transport, and building sectors are major reservoirs of POPs in plastic. He went on to insist that, to make significant impacts on handling of wastes and their management, a much better synergy between the BRS Conventions, the Montreal Protocol, the UNFCCC, and the upcoming Plastic Treaty, is needed.

Brief Overview of the Process for Developing and Updating NIPs

Mr. Sharma shared a brief overview of the National Implementation Plan and challenges. He discussed the process of updating and reviewing the National Implementation Plans (NIPs) under the SC on POPs. He explained that parties to the convention are required to develop and update the NIPs to fulfil their obligations under the SC. The developed plans need to be transmitted to the Convention's governing body, the Persistent Organic Pollutants Review Committee (POPRC), within two years of the convention entering into force for their country and updated regularly. The process for developing and updating National Implementation Plans (NIPs) under the Stockholm Convention involves several key steps:

i. Assessment of National Situation, Stakeholder Engagement, Setting Priorities and Objectives
ii. Action Plan Development
iii. Monitoring and Reporting
iv. Updating the NIPs

This process helps ensure that each country's actions are aligned with global efforts to reduce and eliminate the release of POPs, fostering environmental and public health protection. He also highlighted the challenges faced by developing countries in updating their NIPs within the given timeframe and suggested that the two-year period might be too short for some countries and mentioned a pilot project to streamline the reporting process under Article 15 of the convention.

Introduction to Component 4 of GEF 10785

Ms. Anastasiya Buchok, Senior Project Assistant, Green Growth Knowledge Partnership (GGKP) presented the knowledge services offered by GGKP to the Parties. The component involves enhancing knowledge management and dissemination interventions on the global level through GGKP platform, webinars, workshops, regular newsletters and communities of practice on Green Forum. Component 4 of GEF 10785 also provides outreach assistance to the countries beneficiaries of the project, including development of outreach strategies focusing on private sector and general audiences. GGKP closely collaborates with Components 1 and 2 of this project to ensure the synthesis, publication and dissemination of knowledge products produced by those components. She also noted that all capacity building events hosted by GGKP are recorded and shared on the platform in the languages of interpretation (English, Spanish, French and Russian) and linked to the respective guidance documents to ease countries` navigation and user experience.

Question & Answer Session on Country Experiences and Challenges in NIPs Update and Implementation

The participants discussed the development of inventory guidance for new chemicals with the next COP in 2025, as well as challenges and strategies related to the inventory of new chemicals under the Stockholm Convention. Mr. Sharma highlighted that, while some countries have the toolkit for old chemicals, they lack it for new ones, such as short-chlorinated paraffins.

Question - Cameroon: Under GGKP you mentioned that you are preparing strategies for 32 countries, at what point will you intervene for other countries and their NIPs?
Response: GGKP will share the draft of outreach strategies by the end of 2024, and we try to follow the pace of the countries in developing, reviewing, and updating their NIPs. Country inputs would be important to finalize these strategies throughout 2025.

Question: Three concerns need to be addressed. It has been mentioned that PFAS and PFOS are contained in rain waters, where do they come from, and which mechanism has led them into water?
Response: Since some are volatile precursors, they end up in the air, are degraded by the sun, and brought down by rain. PFASs are difficult to destroy since you would need close to 1,000 degrees of heat or specific technologies. The quality of the incinerator matters. The solution could be the use of cement kilns, which heat up to 1,4500 degrees.

Question: It was mentioned that PFAS are found in waters. Are consumers exposed to PFAS?
Response: Further details and responses to the question were to follow in a later presentation.

Question: POPs are found in plastics. May I know with precision on the POPs in packaging materials?
Response: The response is to be found in subsequent presentations. However, the management of POPs plastic is by best environmental practices. Some special management practices are needed.

Question: Is it a follow-up responsibility for car producers to handle plastics at the end of vehicle use?
Response: Mechanisms are being worked out in pilot countries.

Question: Is it possible to group certain plastics additives as POPs by the Stockholm Convention?
Response: At NIP, you can include in your activities by reflecting on what is happening. In the EU, the European Chemical Agency (ECHA) concludes that a group approach is needed (e.g., for PFAS or for brominated flame retardants). Details can be found on the ECHA website.

Question: Is it possible to revise the period of updating the NIPs?
.Response: Yes, it is possible, but it needs to be required by the Parties at the COP.

Question: I need clarity on the toolkit of NIPs, since as a country, we have difficulties in finding a tool for each chemical.
Response: For all chemicals, there are guidance documents which can be accessed on the SC website. This is a continuous process when new POPs are listed.

Recently Listed POPs (Dechlorane-Plus, UV-328)

Dr. Weber presented details on new POPs, including Dechlorane Plus, UV-328, and Methoxychlor, their major uses, exemptions, and potential impacts on products and industries. These substances were considered for listing under the Stockholm Convention due to their environmental and health risks.

i. Dechlorane Plus was officially listed under the Stockholm Convention in 2023, with specific exemptions for its production and use. Dechlorane Plus is primarily used as a flame retardant in a variety of plastics and electronic products. It is found in wires, cables, and circuit boards. Additionally, it is used in coatings, adhesives, and sealants, particularly in applications requiring high resistance to heat and fire. It can also be found in some electrical and electronic devices, especially in older models produced before stricter environmental regulations were implemented. However, production of Dechlorane Plus has stopped, so there are no new uses expected. Exemptions for Dechlorane Plus include its use in specific sectors such as aerospace, space, and defence applications, as well as in medical imaging and radiotherapy devices. Additionally, replacement parts for and repairs of articles in these applications are exempted from the ban.

ii. UV-328 is a chemical used as an ultraviolet (UV) light stabilizer for plastics, coatings, and paints. Its primary function is to protect materials from UV degradation, which can break down plastics and coatings over time. UV-328 is used in plastics, coatings, and paint formulations to improve their resistance to UV light and extend their lifespan. It is commonly found in consumer products exposed to sunlight, such as outdoor furniture, automotive parts, and paints. The Stockholm Convention includes exemptions for UV-328 in specific applications, including Land-based motor vehicles, Industrial coating applications, Photographic paper, and Stationary industrial machines used in agriculture, forestry, and construction. The production of UV-328 is still ongoing, though the amount produced remains uncertain.

iii. Methoxychlor is a synthetic pesticide and organochlorine compound that was listed as a POP under the Stockholm Convention during the 2019 Conference of the Parties (COP9). Methoxychlor is chemically like DDT but is less persistent in the environment. Methoxychlor was primarily used as an insecticide in agriculture and for pest control in livestock. It was favoured as a replacement for DDT due to its less persistent nature. Methoxychlor is an endocrine disruptor, meaning it can interfere with hormone systems, potentially leading to developmental, reproductive, and immune system issues in both humans and animals. Although it is less persistent than DDT, it remains a concern for long-term environmental contamination. The production and import of methoxychlor have ceased, with the last known production taking place in India in 2023. However, stockpiles and contaminated sites from past use remain a significant issue. The management of methoxychlor involves addressing these stockpiles, particularly in areas that were former producers or formulators of the pesticide and integrating its assessment into broader POP-pesticide management and waste strategies.

The listing of Dechlorane Plus, UV-328, and Methoxychlor under the Stockholm Convention marks a significant step in addressing the risks posed by these chemicals. Their major uses across industries like electronics, agriculture, and manufacturing highlight the ongoing challenges in phasing out harmful substances. The exemptions for certain uses and applications reflect the need for careful management in specific sectors while promoting alternatives and safer practices. Continued monitoring, research, and policy development are crucial to minimizing their environmental impact and protecting public health.

Question & Answer Session

Question: Concern over the use of POPS for fire e.g. UV-328. How can we identify the products in our regions? We have a low capacity for identification and use.
Response: There is a need for proper labelling, as highlighted on the last COP. The SC has guidelines, but it is hard for end users. There is a need for monitoring and assessment of imports. Capacity is weak in Africa, but we need to keep pushing for labelling. To implement GHS is a first step for labelling of chemicals. However, the more difficult challenge is labelling of chemicals in products.

Outcomes of the POPs Review and Listing Proposal in the Next COP

The outcome of the POPs Review Committee (POPRC) meeting included considerable progress in evaluating and recommending additional chemicals for listing under the Stockholm Convention. The criteria for identifying new POPs (Article 8) were elaborated. Any party can submit a proposal for listing chemicals, POPs review committee reviews, develop risk profiles, and risk management evaluations, and make recommendations to the COP, the final COP plans, and the convention is amended accordingly. The committee assessed the persistence, bioaccumulation, and long-range environmental transport of proposed substances, confirming their adverse effects on human health and the environment. Based on scientific reviews, POPRC finalizes proposals for listing new POPs, including substances like chlorpyrifos, for consideration at the next Conference of the Parties (COP). These recommendations aim to expand the Convention's scope, ensuring tighter controls on harmful pollutants while fostering global efforts to reduce their production, use, and release. The outcomes reinforce the Convention's role in protecting ecosystems and human well-being. The following chemicals have been recommended for listing by COP-12; i) Chlorinated Paraffins (C14-17; ≥45% chlorine), ii) Long-chain PFCAs, and iii) Chlorpyriphos.

Session II: Sectoral Inventory Approach for POPs

Guidance Documents to Support the Development and Implementation of the SC and Common and Sectoral Inventory Approaches

Dr. Weber presented POPs inventories which are a foundational tool for managing and mitigating the risks of POPs in line with international commitments. The inventories are useful for Prioritization and Action Plans: They form the basis for determining priorities and developing action plans for managing POPs. Inventories help in tracking the production, use, storage, and waste generation of POPs in a country. They also assist in identifying significant economic sectors and operators and help estimate the necessary implementation capacities. Moreover, inventories highlight sources of POPs that should be prioritized for action. In addition, they assess whether a country's current practices align with the requirements of the Stockholm Convention, identifying areas of non-compliance and providing the necessary data for reporting under Article 15 of the Stockholm Convention. More importantly, inventories help identify gaps and inform prioritization during National Implementation Plan (NIP) development (Article 7) and assist in determining where financial or technical support may be required.

Currently, 34 POPs are listed with 22 newly listed since 2009. Among these are: 5 brominated flame retardants; Three per-fluoroalkyl substances (PFAS) groups PFOS, PFOA, PFHxS, and related compounds; Short-chain chlorinated paraffins (SCCPs); Chlorinated naphthalene (PCN), Hexachlorobutadiene (HCBD), Pentachloro benzene (PeCBz). Three POPs were listed in 2023 at COP11: The first non-halogenated POP was listed in 2023, the UV-stabilizer UV-328, the flame retardant Dechlorane Plus and pesticide Methoxychlor. He highlighted the need for a multi-stakeholder approach, including governmental ministries, customs, private sector, NGOs, and research institutions. He also emphasized the importance of understanding the lifecycle of products and the need for extended producer responsibility. The challenges of managing plastics from various sectors and the potential for recycling were discussed. Lastly, he emphasized the importance of data management and database organization for compiling new inventory reports and integrating information on chemical management and waste management schemes.

Sectoral POPs Inventories - Electronic Equipment and Related E-Waste

Dr. Weber explained that e-waste is the fastest-growing waste stream globally, with an estimated 62 million tonnes in 2022, expected to reach 74 million tonnes by 2030. He provided guidance on calculating the amount of plastic in e-waste, which is approximately 20% of the total. Dr Weber also discussed the various POPs found in electronics, their applications, and the challenges of recycling e-waste plastic containing these chemicals. He emphasizes the importance of proper e-waste management, including the recycling of valuable metals, and highlighted the potential economic value of effectively managing e-waste and separate POPs containing plastic that other plastic can be recycled (example Austrian company). Sectoral POPs inventories are crucial for understanding the extent and sources of the different POPs present in e-waste, such as polybrominated diphenyl ethers (PBDEs) used as flame retardants in electronics. These inventories provide data to guide regulatory and policy interventions, promote environmentally sound management practices, and support recycling processes that prevent POPs' release into the environment and POPs transfer to the plastic recyclates. By targeting electronic equipment and e-waste, this approach integrates POPs management with broader efforts to address the environmental and health challenges of e-waste, fostering a transition towards sustainable waste management and circular economy practices.

Case study: Inventory of POPs in EEE/WEEE in Nigeria

Dr. Joshua Babayemi presented a case study conducted on the inventory of POPs in Electrical and Electronic Equipment (EEE) and Waste Electrical and Electronic Equipment (WEEE) in Nigeria. The study focused on assessing all categories of EEE importation, compiling data on 28 EEE product groups with the highest import volumes. This covered over 98% of officially imported EEE, using data from the United Nations Comtrade Database based on Harmonized System (HS) codes spanning 32 years (1990–2022). The study derived WEEE and EEE import data for Nigeria over the past 30 years from UN Comtrade, estimating the amounts of plastic and POPs present in these imports. It highlights the major POPs in (W) EEE plastics within a low-income country context and provides essential insights for managing these pollutants. This information is crucial for developing strategies for the environmentally sound management (ESM) of WEEE and EEE,

particularly in countries with significant importation of electronic products.

Introduction to the UN Comtrade Database and its Use for POP Inventories

The UN Comtrade database is a comprehensive global repository of international trade statistics, providing detailed information on the import and export of goods between countries. The UN Comtrade uses the Harmonized Commodity Description and Coding System, generally referred to as "Harmonized System" or simply "HS," It allows free access. It serves as a valuable tool for developing and updating POP inventories under the Stockholm Convention by enabling countries to track the trade flows of POP-containing materials, such as flame-retarded plastics, pesticides, and industrial POPs chemicals with specific HS codes. By analyzing trade data, policymakers and researchers can estimate the quantities of POPs with specific HS Codes entering or leaving a country, identify key sources, and prioritize actions for monitoring and management. This facilitates more accurate reporting, strengthens national implementation plans, and supports global efforts to minimize POPs' environmental and health impacts.

Practical Exercise on Using the Comtrade Database

The participants were divided into three groups - one French-speaking and two English-speaking groups - to explore the UN Comtrade database and analyze imports and exports of products containing hazardous chemicals for their respective countries. As a practical session, each country represented in the workshop was introduced to the use of the Comtrade database including tasks like downloaded the import data of HS 852849 for the last 12 years for the country. They found the database useful for getting basic data for developing certain inventories of POPs in plastics and other materials. Some participants noted discrepancies between their country's reported data and global trade data, indicating potential underreporting. The groups discussed challenges like accounting for stockpiles of products containing POPs and explored methodologies like material flow analysis to estimate future waste streams. The exercise highlighted the value of the database for tracking the international trade of hazardous chemicals across sectors.

Sectoral POPs Inventories

Transport Sector

Sectoral POPs inventories in the transport sector focus on identifying and quantifying the presence of POPs in vehicles and associated materials. Common sources of POPs in this sector include flame retardants in vehicle interiors, lubricants, hydraulic fluids, and emissions from engines using POP-containing fuels or additives. These inventories enable governments and stakeholders to assess the scale of POPs in use and waste, such as from end-of-life vehicles and their components. By mapping the transport sector's contributions to POPs, countries can design targeted interventions, promote safer alternatives, and ensure the environmentally sound disposal or recycling of vehicles and associated waste, contributing to the reduction of POPs releases into the environment. It was noted that the life span of vehicles in low- and middle-income countries differs, LMICs are used for extended periods up to 30 - 40 years, compared to Japan which has a recommendation to buy a new car after 7 years. Short-Chain Chlorinated Paraffins (SCCPs) and Medium-Chain Chlorinated Paraffins (MCCPs) are found in PVC and rubber parts, lead, mercury compounds, CFCs, and halogenated OPFR were found to be high in vehicles.

Question & Answer Session

Question: Shall we have the tool to assess PFAS concentration? In the following second presentation you talked about Mercury, but it is not among our documents or annexes. Do we have a way out?
Response: The equipment for the screening of PFAS is expensive since a simple XRF cannot screen fluorine. However, simple assessment has been developed for textiles and carpets using water droplets and the angle the droplet has on the carpets. The method is described in the guidance on monitoring POPs in products and recycling. As for Mercury, it follows under MINAMATA convention. Some countries have ratified but some have not. As a matter of synergy, we extend our coverage to Mercury since certain vehicles produced before 2004 contain mercury in certain applications which is explained in the sectoral guidance.

Question: Considering the discovery of POPs like HBCD, can we take a step to stop their production? Or can we put them in the inventory?
Response: The production of HBCD stopped in 2021. For vehicles manufactured between until 2013 can contain HBCD and vehicles produced until 2017 can contain decaBDE. Therefore, vehicles produced after 2017 do not contain brominated POPs. It is important to consider when the product/building was built/developed to determine if the EPS/XPS insulation contains HBCD.

Question: Do vehicle industries have the capacity to assess the presence of POP?
Response: The sectoral guidelines will help to understand the presence of POPs in vehicles in their management.

Question: Since we have contaminated sites as a challenge, are there any measures on their management?
Response: The UNEP BAT/BEP group developed in the last 3 years BAT/BEP guidelines to handle contaminated sites. Bioremediation can work for some chemicals (for example HCH) but not for all POPs (e.g., POP-PFAS). Depending on the amount of polluted soil they can be taken to and destroyed in cement kilns. Remediation measures are very costly. As a first step contaminated sites should be secured.

Question: Do guidelines from different UNEP GGKP mean that a POP may have more than one guideline? If so, how do we decide which guideline to use?
Response: The sectoral guidelines developed are harmonized with the individual POP inventory guidelines and include the same impact

factors.

Question: Do 'crocs' slippers contain PVC, and do they contain chlorinated paraffin?
Response: There is possible exposure to POPs SCCP and MCCP when crocks are produced from recycled plasticized PVC but there is a need for monitoring. It is advisable to wear other shoes instead of those from recycled PVC.

Question: Are there databases segregated or consolidated?
Response: Databases are not segregated but after analysis one can describe all the pollutants.

Question: Most developing countries receive second-hand vehicles. How do we deal with the contamination since we have no technology to handle the waste?
Response: There is a need to put a limit on imports to have long use before the end of use life. Japan through JICA has a project for end-of-use vehicle management and also the GIZ in Ghana has a vehicle component together with the e-waste project.

Question: What are the methods of disposal of chlorinated paraffin?
Response: The largest share of chlorinated paraffin is used in PVC. Incineration of large amount of PVC is a nightmare. To manage PVC, cement kilns are used. Landfilling is majorly used in Africa. However, there is a need for more recycling through a circular economy with separation of POPs containing plastics.

Question: Is there any % of chloride in chlorinated paraffin that is environmentally friendly? Can we modify the structure to make it biodegradable?
Response: Chlorinated paraffins with chlorine content have better degradable hence does not qualify to be a POP. With high chlorine-%, then you have the problem of lower biodegradation. Therefore, the industry aims to have MCCPs containing e.g., 30% which does not meet the POP criteria of Annex D. The lower the chlorinated paraffin the lower the bioaccumulation.

Question: You alluded to the fact that it is difficult to analyze chlorinated paraffins and what are the available methods for analysis?
Response: Chlorinated paraffin can be analyzed through low-resolution GC-MS, which is available in several laboratories in Africa, but one needs good analytical chemistry skills. We have included low- and high-resolution methodologies for analyzing SCCPs and MCCPs in the guidance on monitoring POPs in products and recycling.

Question: In African countries, could you have traces of PCB in the building?
Response: In Africa, there is no big issue with PCBs in open application like paints and sealants used before 1972. The presence of PCB in paints is through unintentional PCB in pigments in paint products.

Question: Is there a substance that can be used in place of chlorinated paraffin?
Response: We have Stockholm Convention guidance on chlorinated paraffin alternatives. It is also advisable to avoid open burning of electrical cables but instead use cable chopping and cable stripping which is described in the BAT/BEP guidance for UPOPs.

Day 2 - Wednesday, 27 November 2024

Session II (Continuation): Sectoral Inventory buildings & Session III: Inventory development for Short-Chain Chlorinated Paraffins (SCCPs), PCNs and PCB

Sectoral POPs Inventories – Building & Construction Sector

Dr. Weber gave a presentation on the POP inventories concerning the Building & Construction sector. The building and construction sector is highly chemical intensive, with significant environmental and health risks due to chemicals like POPs and other chemicals of concern (CoCs) found in materials such as plastics, wood, and sealants. These chemicals, including HBCD, PBDEs, SCCPs, PCBs, and PFOA, can pollute indoor environments and pose long-term health threats. Construction and demolition waste (CDW) is the largest global waste stream, accounting for over 30% of all waste, with plastic waste being a key concern although only 2% of the CDW. The need for effective management is growing as waste volumes increase. Industrial countries are moving toward a circular economy, focusing on controlled deconstruction and better recovery of valuable materials, including plastic but also have currently low recycling rates of plastic from CDW. Managing plastic waste in an environmentally sound way (ESM) and it is essential, particularly separating plastics containing POPs for safe disposal and only recycling of plastic without POPs.

Building materials, which use a substantial number of plastics are insulation foams, often contain additives such as POPs, flame retardants, and other CoCs. These materials have a long service life of decades (e.g. 50 years), with plastics like PVC, polystyrene (EPS/XPS), polyethylene, and PUR being common in construction. Many of these plastics are treated with harmful chemicals like SCCP, PCBs, PBDEs, and pesticides, which can pose significant risks during their lifecycle. A crucial step in managing POPs in the sector is conducting inventories and assessments of affected materials. This includes screening plastics for harmful substances, such as bromine in flame-retarded materials, and using tools like handheld XRF equipment to conduct national or regional assessments. Detailed inventories can improve waste management practices and the identification of contaminated materials. Sealants used in construction, often contained PCBs until 1970s for flexibility and fire resistance which were substituted by chlorinated paraffins, are another source

of contamination. These materials can accumulate in substantial amounts in buildings, especially in larger structures. Additionally, wood used in construction may be treated with harmful pesticides and chemicals like PCP, DDT, and lindane but also chromated copper arsenate or creosote. This necessitates careful waste management for treated wood, particularly in countries with historical use of these chemicals. Overall, effective management of POPs and other CoCs in construction and demolition waste requires more research, monitoring, and guidance, which can ultimately lead to better plastic waste management and a reduction in harmful environmental impacts.

Establishing an Inventory for SCCPs (and MCCPs) and Assessing Related remaining "Open Uses" of PCBs and PCNs (with Case Study Nigeria)

Introduction to Short-Chain and Medium-Chain Chlorinated Paraffins (SCCP/MCCPs) and related Inventory Development (Dr. Roland Weber)

Establishing an inventory for Short-Chain Chlorinated Paraffins (SCCPs) and Medium-Chain Chlorinated Paraffins (MCCPs), as well as assessing remaining open uses of Polychlorinated Biphenyls (PCBs) and Polychlorinated Naphthalenes (PCNs), involves several key steps to manage and mitigate the risks associated with these POPs. Also, CP mixtures with 1% or more of SCCPs are considered SCCPs/POPs. MCCPs with carbon chain lengths in the range C14-C17 and chlorination levels at or exceeding 45 percent chlorine by weight are proposed for listing at COP12 in 2025. Stockholm Convention listed SCCPs with a chlorine content of >48% as POPs. The most significant use of PCB in open applications was in elastic sealants/caulks and a lower amount in paints in construction built between 1950s to 1980 and in cables. It was also noted that SCCP/MCCP levels in human milk are increasing in most regions and are higher than PCB, with poor countries having higher levels. Further, it was noted that high SCCPs, MCCPs, and LCCPs levels were detected in all house dust samples in South Africa, Australia, Japan, and Colombia with the highest levels in Thailand and South Africa. It was also reported that there were elevated levels of SCCPS and MCCPs in baking ovens in Germany from cables thus directly exposing food and humans from use as plastic additive. There were elevated levels of SCCP and MCCPs in building sealants, paints and coating, and anticorrosion coatings in machinery and installations. A case for PCB-paints contaminating rivers in Sorfjords, Norway and German river Elbe was presented. Indeed, SCCPs and MCCPs pose a problem in recycling and circular economy.
When developing an action plan for the management of hazardous chemicals like SCCPs, MCCPs, PCBs, and PCNs, several key considerations must be addressed. These include conducting thorough inventories to identify sources, usage, and environmental presence of these chemicals, assessing the potential risks to human health and the environment, and ensuring compliance with international agreements such as the Stockholm Convention. Stakeholder engagement is crucial, involving industries, governments, and environmental groups to promote awareness and collaboration. Effective alternatives to these substances should be identified and promoted while providing support for affected industries to transition to safer options. Additionally, robust monitoring systems should be implemented to track progress, enforce regulations, and address legacy contamination. Consideration of the economic implications, along with clear timelines for phasing out harmful uses, is also critical to ensuring a successful and sustainable action plan.

PFOS, PFOA, PFHxS and Related Compounds and Establishing Inventories

Dr. Weber presented the main objective of establishing an inventory for PFOS, PFOA, FHxS, and related compounds which included assessment of their current production, uses, and risks. This includes identifying contaminated sites and understanding how current practices align with the Stockholm Convention (SC) requirements. The goal is to develop strategies for phasing out and managing these substances and to inform action plans and reporting obligations under the Stockholm Convention for POP-PFAS. Between 2009 and 2023, 22 new chemicals were listed as POPs, including various pesticides, flame retardants, and chemicals like Chlordecone, Endosulfan, and others. Three groups of PFAS—PFOS, PFOA, and PFHxS—have also been added to the SC list, and the long-chain perfluoro carboxylic acids (C9-C21 PFCAs) will be considered for listing at COP12 in 2025.
PFAS are "forever chemicals," highly persistent in the environment and does not break down in soil or groundwater. They are mobile and can contaminate drinking water. PFAS bioaccumulate in humans, leading to various health risks, including cancer, developmental issues, immunotoxicity, and endocrine disruption. Exposure to POP-PFAS often exceeds tolerable intake levels set by regulatory bodies like the European Food Safety Authority (EFSA).
Specific PFAS compounds like PFOS, PFOA, and PFHxS have various uses, including in firefighting foams, and industrial applications like metal plating, and textiles. Many of these uses have specific exemptions under the Stockholm Convention. For example, PFOS is allowed in closed-loop systems for hard-metal plating and in firefighting foam for Class B fires. PFOA is used in some textiles and semiconductor manufacturing, with a phase-out period for alternatives until 2025. PFHxS production was halted in 2022, though it may still be present as an impurity in other PFAS products. This inventory aims to identify gaps in the current system, determine if current practices meet Stockholm Convention requirements, and guide future efforts in the management and phase-out of these harmful substances.

Experience with PFAS Assessment in Countries

Question: Are PFAS found in firefighting foam?
Response: This should be mentioned in the material safety data sheets (MSDS) but often this is not the case. Countries should establish GHS system which require reporting of chemicals in mixtures above 0.1%.

Question: For PFAS do alternatives exist for textiles and carpets in professional specifications?
Response: Alternatives are available for most textiles. In carpets, PFAS are not needed anymore.

Question: Do we have a specific inventory for PFAS in rivers?

Response: The assessment of PFAS is a priority for drinking water and groundwater. The use of PFAS is also a risk for ecosystem and accumulate in fish, seafood, and livestock. One source to investigate are fluorinated pesticide containers.

Session IV: Work Plan Development, NIPs Update and Outlook on Implementation

Work Plan Development Considerations (Work Plans for Inventory Development)

The development of an industrial inventory for persistent organic pollutants (POPs) like PFOS, PFOA, PFHxS, and related compounds involves several key steps:

i. Planning the Inventory: This initial step involves setting objectives, defining the scope of the inventory, and determining which sectors and processes will be involved in tracking the use and presence of POP-PFAS substances.
ii. Choosing methodology for data collection: The methodology for collecting data needs to be selected, considering the sectors that use or produce PFOS, PFOA, PFHxS, and related compounds. This includes identifying relevant data sources and deciding how to approach data gathering.
iii. Data collection: Data can be collected using various methods:
    a) Distributing surveys to businesses and industries that may use or release POP-PFAS.
    b) Reviewing existing information from public databases, research papers, or industry reports.
    c) Conduct field visits to inspect facilities, collect samples and perform chemical analyses.
    d) Monitoring the movement of POP-PFAS substances across borders.
iv. Evaluating the quantities of PFOS, PFOA, PFHxS, and related compounds in existing stocks, waste, and products like synthetic carpets.
v. Evaluation and data Management: Once data is collected, it needs to be assessed for accuracy, completeness, and relevance. This phase involves organizing and managing the data for effective analysis and decision-making.
vi. Inventory report: The last step is to compile the findings into a comprehensive inventory report. This document will summarize the data collected, identify gaps or areas of concern, and support the development of strategies for managing and phasing out these substances by the Stockholm Convention.

The overall goal is to create a clear, comprehensive inventory that will guide future actions, inform regulatory measures, and track progress toward reducing the environmental and health impacts of POP-PFAS substances.

The NIPs Template as an Approach for Harmonized NIPs and Harmonized Data-generation for NIPs and Article 15 Reporting

NIPs are central to the implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs). To ensure consistency, transparency, and efficient reporting across countries, a harmonized approach to developing NIPs and generating related data is essential. The NIP template provides a structured framework for countries to follow, ensuring that their national action plans are aligned with international guidelines and can be easily compared across different contexts.

Key Features of the NIP Template Approach

i. Standardized framework: The NIP template offers a standardized structure for countries to report on their progress in eliminating or reducing POPs. By using a common template, countries can present their information in a consistent format, making it easier for stakeholders, including the Secretariat of the Stockholm Convention, to assess and monitor progress.
ii. Harmonized data generation: The template guides countries in collecting, organizing, and reporting data in a harmonized manner. This ensures that data from different countries is comparable and can be aggregated for global assessments and reporting under Article 15 of the Stockholm Convention. Harmonized data generation also facilitates the identification of trends, gaps, and best practices across regions.
iii. Facilitating Article 15 reporting: Article 15 of the Stockholm Convention requires countries to report on their progress in implementing their NIPs. The NIP template supports this reporting process by providing a clear structure for countries to report on the status of their obligations under the Convention, including the elimination or reduction of specific POPs. It ensures that the information provided for Article 15 reporting is comprehensive and standardized.
iv. Transparency and accountability: By using the NIP template, countries commit to transparency in reporting their efforts to address POPs. This transparency fosters accountability at both the national and international levels, ensuring that countries are making meaningful progress in reducing the risks posed by these chemicals.
v. Support for monitoring and evaluation: The harmonized approach provided by the NIP template also supports effective monitoring and evaluation of each country's implementation efforts. By aligning data collection and reporting methods, the template helps identify areas where additional support or action is needed to meet the objectives of the Stockholm Convention.

The NIP template serves as a crucial tool for ensuring that countries develop their National Implementation Plans in a harmonized, consistent, and transparent manner. By promoting standardized data collection and reporting, the template enhances the effectiveness

of the Stockholm Convention's monitoring and reporting mechanisms, ultimately contributing to the global effort to eliminate or reduce the impact of POPs.

Experience with Using the NIP Template for Development of NIPs

The experience with using the NIP template for developing NIPs under the Stockholm Convention has been largely constructive, as it provides a clear and standardized framework for addressing POPs. The template facilitates the systematic collection of data on the use, production, and disposal of POPs, helping countries identify priorities for action and align national efforts with international commitments. While the process has helped streamline planning and reporting, some challenges have emerged, particularly regarding the availability of accurate data and coordination among diverse stakeholders, including government agencies, industries, and environmental organizations. In some cases, countries have faced difficulties in assessing the full scope of POPs' presence due to gaps in monitoring or historical use. Nonetheless, the NIP template has proven to be an essential tool for guiding national efforts toward the reduction and elimination of harmful chemicals, supporting long-term environmental and public health goals.

Question: When inputting information into the toolkit, to whom shall you be speaking?
Response: Officially the template is sent to BRS. One can make more inquiries to Mr Sharma at the secretariat.

Questions: Is it possible to start simulating the information we have in the system?
Response: Yes, it is possible to provide some information. Currently, the system is in its pilot stage and one can try.

Sustainable Management of E-Wastes and Related Plastics - Example on Ghana

Dr Tobias Sautter of the Öko-Institut *(Institute for Applied Ecology) (Oeko)* presented an important example of both the challenges and opportunities related to the sustainable management of e-waste and plastics in Ghana. The country has made strides in formalizing e-waste recycling, implementing public awareness campaigns, and developing innovative approaches to plastic recycling. However, much work remains to be done, particularly in terms of creating an inclusive and efficient waste management system that can handle the growing e-waste crisis. By investing in safe recycling technologies, strengthening policy frameworks, and fostering international cooperation, Ghana has the potential to lead the way in demonstrating how developing countries can tackle the environmental and social issues posed by e-waste and plastic pollution while promoting sustainable economic growth.

Management of Chlorinated and Brominated POPs Containing Major Wastestreams and Related Plastics

The management of chlorinated and brominated POPs containing major waste, including related plastics, requires a comprehensive and multifaceted approach to minimize environmental and health risks. These wastes, often found in industrial by-products, electronic waste, end of life vehicles, CDW, contaminated soils, and impacted other plastics, pose significant challenges due to their persistence, toxicity, and bioaccumulation. Effective management strategies include identifying and segregating POPs-containing materials during waste collection, recycling, and disposal processes. Technologies such as high-temperature incineration, chemical dichlorination, and advanced waste-to-energy systems can be employed to destroy or transform these hazardous compounds. For plastics, safe recycling practices with separation of POPs containing plastics are essential to prevent the contamination of recyclates and new products and release of POPs into the environment. The promotion of the use of safer alternatives is an important part of the solution. Additionally, proper labelling and tracking of contaminated waste streams are necessary to ensure compliance with regulations such as the Stockholm and Basel Convention, which seeks to eliminate or reduce the presence of POPs in products and wastes. African countries need to assess the option of using cement kilns for POP destruction. This needs knowledge and changes in the cement kiln and capacity building of the facilities. Assessment of available waste and available destruction capacity in BAT kilns. Then pilot projects & lessons learned from such projects for multiplication (E.g. South Africa, Ghana). A collaborative approach involving governments, industries, and environmental organizations is vital for developing sustainable solutions to manage these hazardous materials effectively.

Wrap-up and Q&A

Question - Togo: Can our facilities incinerate the plastic, or do we need to invest in modern technology?
Response: The kiln needs to be assessed by an expert to determine its capability and the type of waste which can be treated. In old kilns such as wet kilns or long kilns without pre-calciner, we cannot control emissions if chlorine enter the system. Also, for modern kilns there is a limit of the amount of chlorinated and brominated plastic input to the kiln which can impact and even stop operation.

Question - Senegal: What is the value of used tyres, is it the same as for plastics?
Response: Cement kiln can be used to recover energy and iron from tyres. Tyres do not contain high chlorine and does not pose a problem of chlorine accumulation and do not need a chlorine bypass. However, if too high rates of tyres are fed the emission of VOCs including benzene increases.

Question – Guinea: – Is the use of waste oil okay in incinerators, since from oils, there is no waste generated apart from emissions?
Response: Waste oil can be used as fuel. Big incinerators have monitors hence you can control the combustion process. However up to now large incinerators failed in Africa with the recent example of Ethiopia. However, mercury waste cannot be fed into cement Kilns. Mercury fumes go into the air in cement kilns and are highly poisonous.

Day 3 - Thursday, 28 November 2024

Session V: Monitoring of POPs in Africa

Introduction to the GEF/UNEP African Plastic Project

A Project on "Circular and POPs-Free Plastics in Africa" was presented by Prof. Percy Onianwa (Director, Basel Convention Regional Center) to reduce the release of Persistent Organic Pollutants (POPs) from plastic products across Africa, focusing on five countries: Kenya, Nigeria, South Africa, Uganda, and Zimbabwe. The key outputs of the project were:

1. *Policy reviews & regulations*: Development of gender-sensitive, country-specific policies to manage POPs in plastics. Circular economy: Pilot partners adopt sustainable practices, with a focus on reducing contaminated plastics.
2. *Waste Management Practices*: Training recyclers, collectors, and waste shredders to separate hazardous plastics fractions and reduce exposure.
3. *Awareness Raising*: Targeting 3,600 beneficiaries to increase knowledge of POPs in plastics and circular practices. By addressing barriers such as weak policies, low technical capacity, informality, and lack of awareness, the project aims to reduce the environmental impact of POPs in plastics, contributing to a more sustainable and circular economy in Africa.

Results from Monitoring of POPs in Plastics Within the PPG Phase of the GEF-African Plastic Project

During the PPG (Project Preparation Grant) phase of the GEF African Plastic Project, monitoring of POPs in plastics revealed concerning levels of contamination in various plastic waste streams across participating countries. The results indicated the presence of POPs, including chlorinated and brominated compounds, in plastics collected from urban areas, waste dumps, and recycling facilities. These findings underscored the widespread distribution of POPs in plastic materials, often due to their historical use in flame retardants, stabilizers, and other additives. The data highlighted the need for targeted interventions to address POPs in plastic waste management and recycling practices, emphasizing the importance of improving waste segregation, enhancing monitoring systems, and promoting the use of safer alternatives. The results served as a critical baseline for shaping the next phases of the project, focusing on reducing POPs in plastics and developing more sustainable, environmentally friendly plastic management strategies across Africa. Examples were given for the automotive sector in South Africa, Kenya; Electronics in Nigeria, Uganda, Construction, Zimbabwe.

Establishing Capacity to Monitor POPs in Different Matrices Using Hyphenated Chromatography in South Africa -Progress and Challenges

A case study project focusing on establishing the capacity to monitor POPs in different matrices using Hyphenated Chromatography in South Africa was shared with the participants by Prof. Jonathan Okonkwo. It was aimed at building capacity in South Africa to monitor Persistent Organic Pollutants (POPs) in various environmental matrices using advanced analytical techniques, particularly hyphenated chromatography. A detailed sampling protocol was shared which is critical for monitoring POPs. The key aspects include:

i. Types of samples: Water (e.g., wastewater, groundwater, sea/river water), soil, air, sediment, sludge, consumer products, and plastics
ii. Location: Precise coordinates of sampling sites
iii. Sample Information: Includes details on sampling containers, volume/weight, time of collection, weather conditions, and preservation methods

For Quality Assurance and Control (QA/QC), blanks and certified reference materials are analyzed to ensure accuracy. Recovery of POPs is monitored using surrogate standards. Thorough cleaning of equipment and avoidance of cross-contamination are essential. Solvents and gases used must be free of interference to ensure precise results. So far, the progress made is as follows:

i. The project has successfully built the capacity to analyze POPs in various environmental matrices, including air, water, soil, and consumer products.
ii. Graduate students (MSc and PhD) have been trained in POPs analysis, ensuring future expertise in this area.

While the project has made noteworthy progress in developing the capacity to monitor POPs in South Africa, it faces challenges related to funding for materials and equipment, as well as the retention of skilled researchers. These hurdles need to be addressed to ensure the long-term sustainability and effectiveness of POPs monitoring efforts in the country.

UNEP/GEF Global Chemicals Monitoring Programme (GCMP) to Support the Implementation of the Stockholm and Minamata Conventions

Ms. Haosong Jiao introduced to the UNEP/GEF Global Chemicals Monitoring Programme (GCMP) which plays a crucial role in

supporting the implementation of the Stockholm and Minamata Conventions by providing countries with the tools and data necessary to monitor and assess the presence and trends of hazardous chemicals, particularly POPs and mercury. Through this program, UNEP works with countries to strengthen their national monitoring capacities, enabling them to collect reliable data on the environmental levels, sources, and pathways of these chemicals. The GCMP supports the development of inventories, the establishment of monitoring networks, and the capacity building of national institutions, facilitating the timely reporting of data required under the conventions. Additionally, the program helps countries identify gaps in their chemical management systems, offering technical assistance and guidance for the development of national action plans. By improving data collection, analysis, and reporting, the GCMP contributes significantly to global efforts to reduce and eliminate the harmful effects of POPs and mercury on human health and the environment, in line with the goals of the Stockholm and Minamata Conventions.
For African countries, the focus has been on addressing gaps in monitoring infrastructure, strengthening national and regional capacities, and promoting integrated monitoring approaches to track POPs over time. Future options for expanding POPs monitoring in African estuaries include increasing the use of remote sensing and in-situ sensors for real-time data collection, enhancing the involvement of local communities, and integrating data into national reporting systems for the Stockholm Convention. Strengthening regional cooperation, ensuring long-term funding, and expanding public-private partnerships will be key to sustaining these efforts and advancing the goals of the UN's global chemicals agenda.
The main output for this project includes 30 POPs analyzed in over 1300 samples of air, water, human milk, and matrices of national interest in 42 countries. Training in 6 national laboratories. 289 laboratories registered in the interlaboratory assessments with reported data. Over 50,000 data points were generated. Over 20 years of human milk data covering 82 countries globally. 228 reported data and 256 POPs laboratories were included in the POPs/Mercury/Lead laboratory databank.

Monitoring and Capacity Building on POPs in Plastic Recycling in Low-and-Middle-Income Countries – Contribution by a Short-Term GMP Activity

Dr. Weber introduced the project *"Monitoring and Capacity Building on POPs in Plastic Recycling in Low-and-Middle-Income Countries"* which was aimed to address the lack of monitoring data on Persistent Organic Pollutants (POPs) in plastic recycles, particularly in low-and-middle-income countries (LMICs). The initiative was part of the Global Monitoring Plan (GMP) under the Stockholm Convention and ran from March to July 2023. The key Components of the project were: Webinar Series on an overview of POPs, sampling techniques from major sectors to monitor POPs in plastics, and training methods for extraction, clean-up, and analysis of POPs in plastics. An evaluation of existing knowledge and gaps in POPs monitoring in plastics across major use sectors and monitoring activities by sampling and analysis of selected POPs in recycled plastic pellets and shreds from LMICs. The project highlighted the need for better monitoring, assessment, and regulatory control in plastic recycling, especially regarding hazardous additives in recycled materials. It also called for developing science-based POP limits and emphasized the importance of addressing broader concerns beyond POPs, such as unregulated hazardous plastic additives. The findings suggest that plastic recycling, particularly in LMICs, is a significant area for policy and scientific attention, with potential implications for future global agreements like the proposed Plastic Treaty.

Monitoring UV-328 and Other UV-stabilizers in Recycled Plastics (HDPE)

Dr. Lee Bell from the International Pollutant Elimination Network (IPEN) showed that monitoring UV-328 (a common UV stabilizer) and other UV stabilizers in recycled plastics, particularly high-density polyethylene (HDPE), is a major step in assessing the safety and environmental impact of recycled plastic materials. UV stabilizers like UV-328 are often added to plastics to prevent degradation from UV radiation, extending the material's lifespan in outdoor applications. However, these stabilizers can leach out of plastics during recycling, potentially posing environmental and health risks due to their persistence and toxicity. Monitoring involves detecting and quantifying these chemicals in plastic waste streams and recycled products using analytical techniques such as high-performance liquid chromatography (HPLC) or gas chromatography-mass spectrometry (GC-MS). Regular monitoring can help identify the presence and concentration of UV-328 and other stabilizers in recycled HDPE, ensuring that they do not exceed safety thresholds. It also supports the development of guidelines for the safe recycling and reuse of plastics, including identifying safer alternatives to harmful stabilizers and improving recycling practices to minimize contamination in new products. This monitoring is critical for aligning with global chemical safety frameworks like the Stockholm Convention, which seeks to reduce the use of hazardous chemicals in materials.

Atmospheric Monitoring of Persistent Organic Pollutants (POPs) along the Maritime Silk Road, including Africa

The project "Atmospheric Monitoring of Persistent Organic Pollutants (POPs) along the Maritime Silk Road, including Africa" from Professor Gan Zhang (Chinese Academy of Science) explores the global distribution and monitoring of hazardous chemical pollutants, particularly POPs, along the maritime trade routes of the 21st Century Maritime Silk Road (MSR), which connects Asia, Africa, and Europe. The project emphasizes the significant global challenges posed by the movement of chemical pollutants along the Maritime Silk Road. It underscores the importance of atmospheric monitoring, international cooperation, and strengthening monitoring capacities in developing regions to manage and reduce the impact of POPs. The growing shift of chemical production and waste to Asia, alongside inadequate regulatory frameworks in some regions, makes the need for comprehensive monitoring and controls more urgent.

UN-Endorsed Global Estuaries Monitoring Programme: Progress and Future Options for POPs Monitoring in African Estuaries

The UN-Endorsed Global Estuaries Monitoring Programme (GEMP) from Hongkong University aims to enhance the monitoring of POPs and pharmaceuticals in estuarine ecosystems, which are critical habitats for biodiversity and often serve as entry points for

pollutants into marine and freshwater systems. It involves 10 countries in Latin America, 10 in the Caribbeans, 15 in Africa, 10 in Asia, and 9 in the Pacific. Progress in the program has seen significant advancements in the development of standardized monitoring protocols, capacity building, and collaboration across countries to assess the contamination of POPs in estuaries. Additionally, advancing research on the effects of POPs on estuarine biodiversity, fish stocks, and human populations, particularly in coastal communities dependent on estuarine resources, will be essential for guiding policy development and promoting sustainable management practices. These efforts will provided valuable data on the presence of pharmaceuticals and POPs contributing to a better understanding of their sources, distribution, and impact on both ecosystems and human health.

Discussion on Strengthening POPs' Monitoring in Africa

UNIDO Toolkit for the Design of Waste Management Plans with an Integrated Estimate of Unintentional POPs/Dioxin Release and Greenhouse Gas Emissions

The UNIDO Toolkit focuses on software development for waste and resource management, specifically through the *Waste Management Planning Tool* (WaPla). This tool helps municipalities, especially in developing countries, design and improve waste management systems by integrating estimates of unintentional POPs/dioxin releases and greenhouse gas emissions. Key components of the toolkit. WaPla Software is the tool for evaluating and planning landfills, optimizing the operation of Waste-to-Energy (WtE) plants (OBAMa), monitoring fossil CO2 emissions at WtE plants, controlling waste mixing, and establishing a fossil carbon taxing system.
The tool has challenges in many developing countries, such as limited knowledge of waste flows (amount and composition), environmental impacts of waste management, and the financial implications of waste management strategies (costs of measures). As such the toolkit aim to support municipalities in improving waste management by analysing current waste management systems, evaluating future scenarios, and supporting informed decision-making. The potential results of WaPla: include the provision of insights on: Waste flows (e.g., required plant capacities), Environmental impacts (GHG and unintentional POP emissions), recycling, recovery, and disposal rates, and Waste management costs (OPEX and CAPEX).

Question. Can the UNIDO Tool be used for managing greenhouse gas emissions from other sources?
Response: No. The tool focuses on waste incineration and composite and open fire burning only. No PCNs and PCBs in the UNEP toolkit

Question. Can a country like Ethiopia get funding for POPs emission management?
Response: Collaborate with the Vienna University, Austria which is currently running a project on waste management, but no funding.

National Reporting under the Stockholm Convention on Persistent Organic Pollutants (Online Presentation by Lina Fortelius - BRS Secretariat)

National reporting under the Stockholm Convention for African countries plays a crucial role in tracking progress towards the elimination of POPs and ensuring compliance with the treaty's requirements. Under the Stockholm Convention, each country is required to submit periodic reports on their implementation of the convention, including information on the identification and elimination of POPs, the management of stockpiles and wastes containing POPs, and the progress made in reducing and eliminating POPs from industrial processes and consumer products. For African countries, this reporting process is often supported by capacity-building initiatives from organizations like UNEP and the GEF, which help strengthen the ability of national governments to monitor, assess, and report on the presence and management of POPs.
The reports typically include data on the sources, uses, and inventories of POPs, as well as measures taken to phase out or reduce their use. In addition to providing data on compliance, these reports help to identify challenges such as insufficient technical infrastructure, lack of financial resources, and gaps in data collection, particularly in rural and informal sectors where the use of POPs might not be well-documented. African countries also use these reports to outline their national action plans, which may include measures to reduce emissions, safely dispose of POPs-containing waste, and promote safer alternatives. National reporting under the Stockholm Convention is essential for fostering transparency, guiding policy decisions, and improving the overall effectiveness of the global effort to protect human health and the environment from the harmful effects of POPs.

Means of Implementation: Technical Assistance and Financial Resources under the Convention

The Stockholm Convention on Persistent Organic Pollutants (POPs) provides a framework for global cooperation to eliminate or restrict the use of harmful chemicals that persist in the environment. The effective implementation of the Convention's objectives, particularly in developing countries and countries with economies in transition, relies on technical assistance and financial resources.

Technical Assistance is aimed at building capacity, sharing expertise, and transferring knowledge to enable countries to manage POPs effectively. This assistance includes:

i. Capacity building: Providing training, workshops, and knowledge-sharing platforms to strengthen national capabilities in monitoring, managing, and safely disposing of POPs.
ii. Implementation of national action plans: Supporting countries in developing and executing national strategies for the reduction and elimination of POPs.
iii. Technology transfer: Facilitating the adoption of environmentally sound technologies to treat, eliminate, or safely manage POPs and hazardous waste.
iv. Awareness raising: Promoting understanding of the risks associated with POPs among local communities, governments, and

industries.

Financial Resources are essential for enabling developing countries to fulfil their obligations under the Stockholm Convention. The financial support includes:

i. GEF provides funding for projects aimed at reducing and eliminating POPs, particularly in low-income and developing countries.
ii. Financial resources are allocated to support national projects that focus on the assessment, reduction, and disposal of POPs and other chemicals of concern.
iii. Providing grants to strengthen the regulatory frameworks, monitoring systems, and waste management infrastructure needed for sustainable POPs management.

Together, technical assistance and financial resources are crucial for the effective implementation of the Stockholm Convention, ensuring that countries can address the challenges posed by POPs and safeguard human health and the environment.

Question: Is there any provision for two OCPs or NFPs for the parties since most of the times the NFP have a busy schedule?
Response: Yes. There is an opportunity to have more than 1 OCP and 1 NFP.

Conclusions and Next Steps

Findings

i. Large quantities of POPs containing plastics are present in e-waste, end-of-life vehicles, and construction/demolition waste in Africa, posing significant management challenges.
ii. Separation and recycling of these plastic fractions is important but has limitations due to the presence of POPs and other hazardous additives.

Solutions

- Effective regulation, enforcement, and financial mechanisms are critical to prevent market failures and the associated environmental and health impacts from improper waste management.
- Pilot projects, e.g., in Ghana, are demonstrating the feasibility of sorting e-waste plastics and co-processing waste in cement kilns assessment, upgrades, and monitoring to ensure proper operation.
- Assessing and upgrading existing infrastructure (e.g., cement kilns) to enable environmentally sound waste treatment
- Extended producer responsibility and economic incentives are needed to drive sustainability.

Responsibility

i. All participants review and familiarize themselves with the sectoral guidance documents for POP inventories.
ii. All participants utilize the UN Comtrade database to gather import/export data for POPs and related products for their countries.
iii. All participants explore using impact factors provided in the guidance to estimate POP quantities from product import data.
iv. All participants considered conducting dynamic material flow analysis for electronics and vehicles in their countries.
v. All participants share learnings from this workshop with other relevant focal points in their countries.

Recommendations

i. Support the establishment of sustainable e-waste and plastic waste management systems, building on successful pilot projects like the one presented in Ghana.
ii. Extended producer responsibility and economic incentives are needed to drive sustainable management of these waste streams.
iii. Develop national inventories to estimate the quantities of hazardous substances in various sectors.
iv. Enhance monitoring and research on pollutants in developing countries, especially where second-hand imports dominate.
v. Promote capacity building and knowledge sharing for effective waste management practices.

Closing Remarks

Dr. Sevgan expressed his heartfelt gratitude to the BRS Secretariat, the United Nations, *icipe* management, and all participants for their active involvement and contributions. He extended special thanks to the translators, IT support team, facility staff, and the GGKP and *icipe* staff, whose efforts were pivotal to the success of the workshop.
Dr. Weber appreciated the participants for their active engagement throughout the workshop and encouraged them to reach out to him directly with any queries or clarifications. Mr Suman conveyed his thanks to all participants, emphasizing the importance of open communication and inviting feedback or questions to be shared with him directly. He also acknowledged Dr. Weber's significant contributions to the workshop, including training and materials preparation. Suman encouraged participants to explore the Nairobi National Park and expressed his appreciation to Dr. Sevgan and Ms Annah for their exemplary efforts in organizing the workshop. On the other hand, Ms. Anastasiya Buchok thanked everyone for their dedication and participation in the workshop aimed at updating the National Implementation Plans (NIPs). She encouraged partners to remain in contact with her for further discussions or collaborations. Dr. Sevgan officially closed the workshop, marking the conclusion of a productive and impactful event.