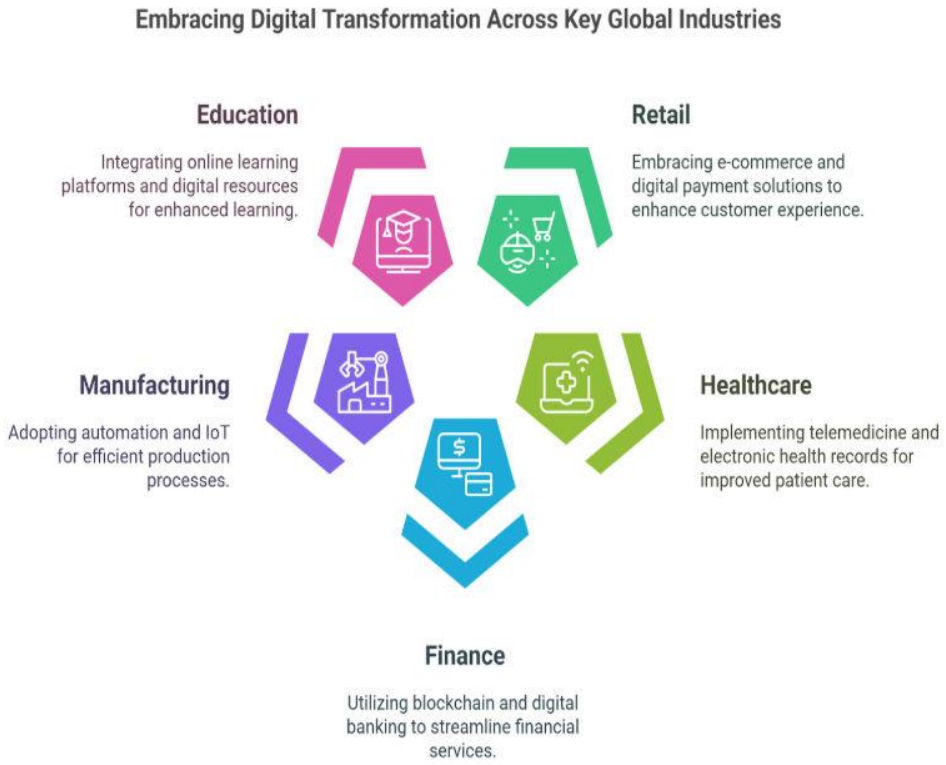
Strengthening Capacity to Better Produce and Use POPs Monitoring Data

Brij Mohan Sharma, PhD
Chemicals Science and Policy Unit, UNEP

29 October 2026
14:00 - 15:30 (CET, GMT+1)

Hosted by GGKP under the GEF-funded and UNEP-led Global NIP Update Project (GEF ID 10785)

Background: Power of Data



The transformation is not simply more data, rather it is faster feedback between evidence and decisions

Key application of data in environmental protection

Climate modelling

Aggregating historical and real-time atmospheric information to track long-term climate change patterns, forecasting weather events, and modeling global warming interrelationships

Water resources and watershed management

Mapping water-related hazards, analyzing water quality and quantity, preventing pipeline or hydroelectric leaks, and guide sustainable spatial planning

Air pollution and emission tracking

Monitoring real-time air quality in urban centers and pinpoint industrial emissions

renewable energy optimization

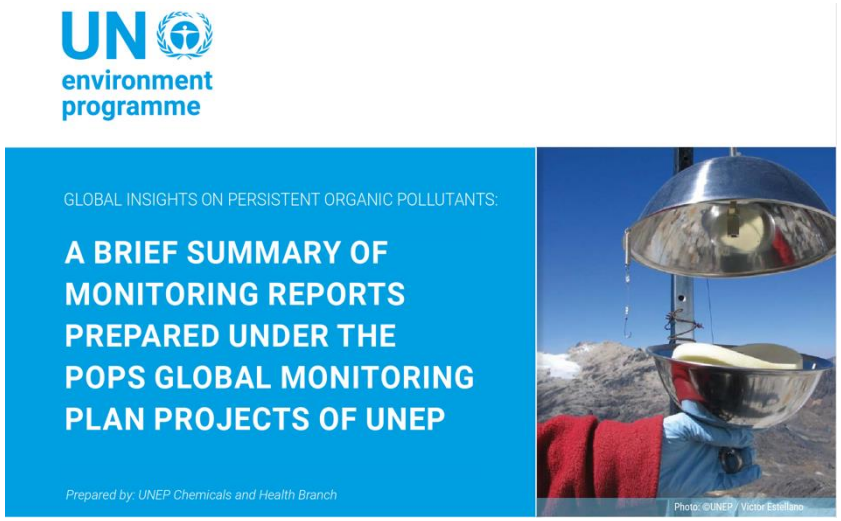
Analyzing wind patterns to select optimal locations for wind turbines and calculating real-time solar angles to maximize photovoltaic efficiency

Measure changes -> Identify priorities -> Actions -> Verify progress

Background: State of challenges

At the fifth session of the UN Environment Assembly, world and digital-industry leaders discuss how environmental action must be backed by latest technologies, including earth observations, Artificial Intelligence, Machine Learning and the Internet of Things.

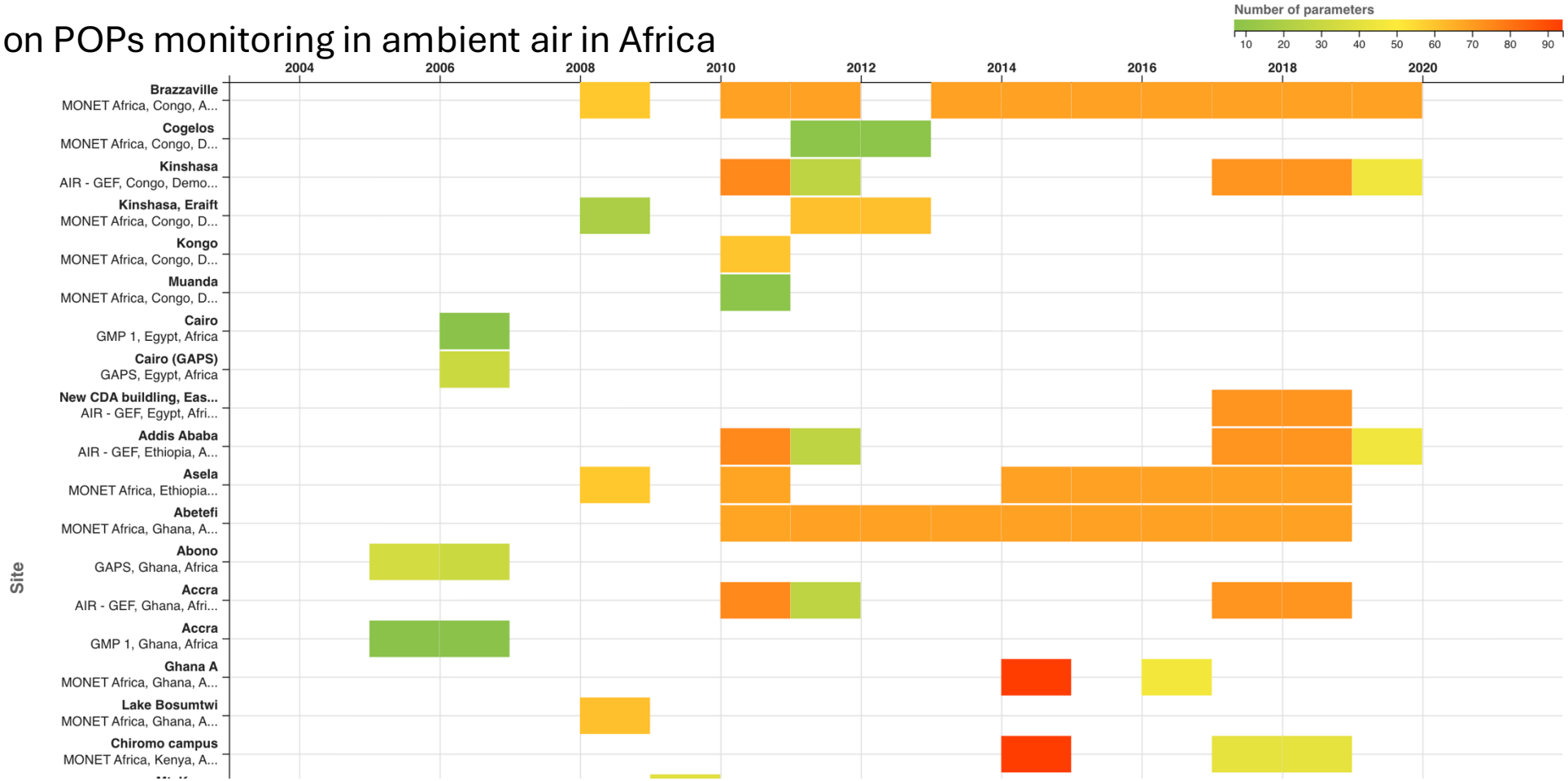
How do we get to a more sustainable and inclusive future if we don't know where we are? This is where data comes in and, right now, we do not have the data we need.



While some background data on POPs concentrations in the environment and human milk have been gathered, significant gaps still exists, particularly for new POPs

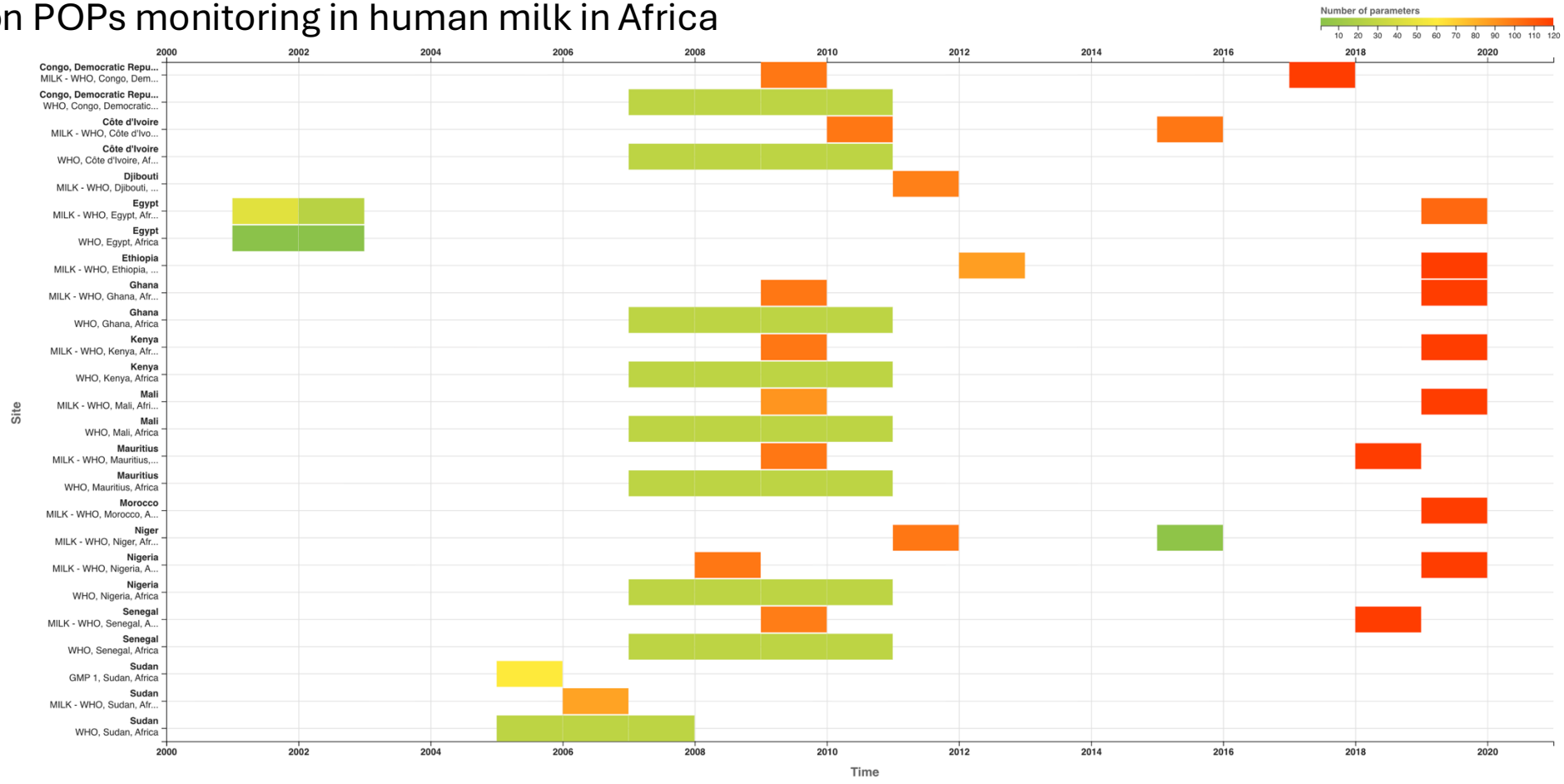
Background: State of challenges

Data on POPs monitoring in ambient air in Africa



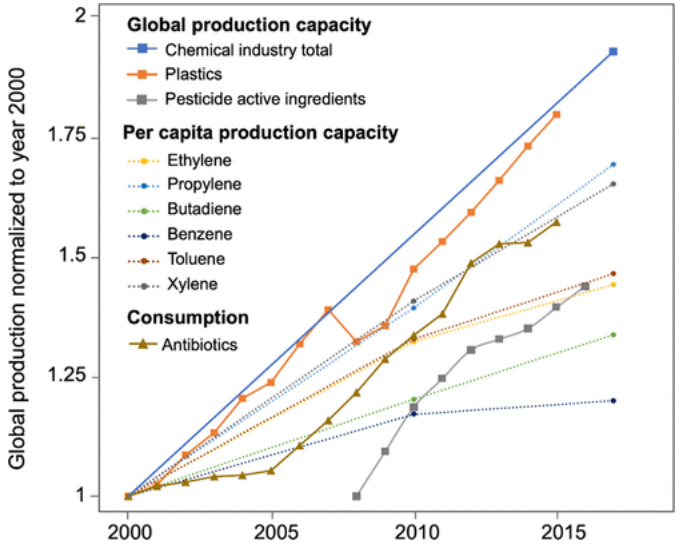
Background: State of challenges

Data on POPs monitoring in human milk in Africa



Background: Why data gaps exist

Sharp growth of chemicals market: The global market features over **350,000 registered chemicals and chemical mixtures**, while the overarching scientific Chemical Abstracts Service (CAS) Registry tracks **over 300 million unique chemical substances and sequences** (growing by roughly 10 to 20 million new entries per year)



Environ. Sci. Technol. 2022, 56, 3, 1510-1521

Persistent Organic Pollutants (POPs)

From 12 dirty dozens in 2004 → From 37 POPs in 2026

Can there be more POPs?

Background: Why data gaps exist

Atmospheric Pollution Research
www.atmospolres.com



How many persistent organic pollutants should we expect?

Martin Scheringer [1], Sebastian Strempel [1], Sirja Hukari [1], Carla A. Ng [1], Markus Blepp [2], Konrad Hungerbuhler [1]

[1] *Institute for Chemical and Bioengineering, ETH Zürich, 8093 Zürich, Switzerland*
[2] *Öko-Institut, Merzhauser Straße 173, 79100 Freiburg, Germany*

Somewhere between **190 – 1200** chemicals can be classified as POPs

Under the Stockholm Convention on Persistent Organic Pollutants (POPs), currently 22 chemicals or groups of chemicals are regulated as POPs. However, various screening exercises performed on large sets of chemicals indicate that the number of substances fulfilling the screening criteria defined in Annex D of the Stockholm Convention might be much higher. Most of these screening studies searched for highly persistent and bioaccumulative chemicals, but did not include the long-range transport potential, which is a key criterion under the Stockholm Convention. We apply the screening criteria for persistence, bioaccumulation and long-range transport potential of the Stockholm Convention to a set of 93 144 organic chemicals. Because no toxicity threshold is defined under the Stockholm Convention, we use the toxicity threshold of REACH, the chemicals regulation of the European Union. For the vast majority of the chemicals, the property data required for the assessment had to be estimated from the chemical structure. Assessment results for the acknowledged POPs and for POP candidates currently under review are discussed. Beyond these well-known substances, we find 510 chemicals that exceed all four critieria and can be considered potential POPs. Ninety eight percent of these chemicals are halogenated; frequent types of chemicals are halogenated aromatic compounds, including polychlorinated diphenylethers, tetrachloro benzyltoluenes, brominated and fluorinated naphthalenes and biphenyls; and highly or fully chlorinated and fluorinated alkanes (cyclic, linear, branched). Non-halogenated substances are highly branched alkanes and nitroaromatic compounds. Ten substances are high-production volume chemicals and 249 are pre-registered in the EU. We used uncertainty ranges of the chemical property data to estimate a lower and upper bound of the number of potential POPs; these bounds are at 190 and 1 200 chemicals. These results imply that several tens of potential POPs may have to be expected for future evaluation under the Stockholm Convention.

Background: Why data gaps exist

Other factors, beyond the large number of chemicals

Expanding chemicals use

Industrial production, global trade and complex supply chains create diverse exposure

Uneven analytical capacity

High costs, specialized methods, trained personnel and reference materials constrain coverage

Fragmented data-to-policy links

Irregular monitoring and weak communication reduce the impact of available evidence

POPs Monitoring data to strengthen National Implementation Plan

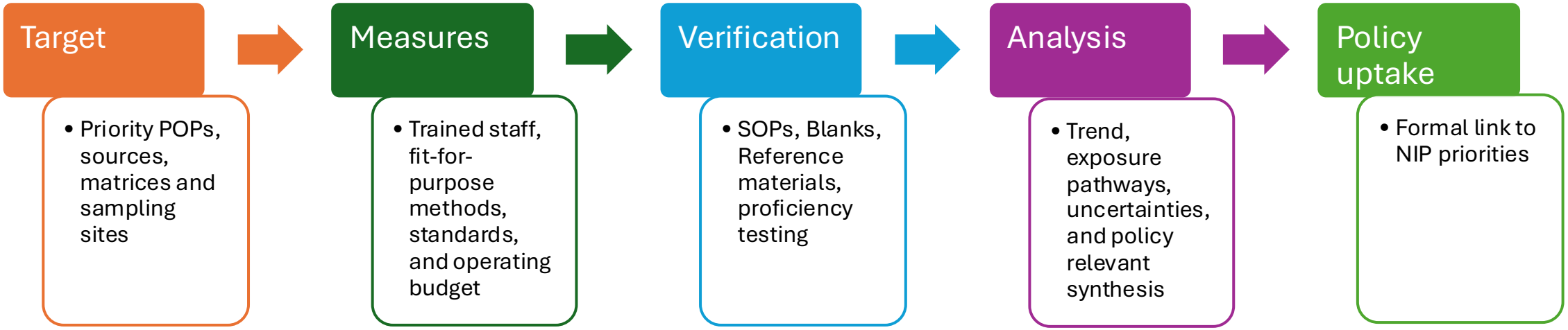
Under **Article 7** of the Stockholm Convention, each Party must develop and update a National Implementation Plan (NIP) to show how it will meet its obligations to eliminate or restrict POPs

NIPs translate convention obligations into National priorities and actions

NIP development and updates rely heavily on baseline and empirical data gathered through national systems and the **Global Monitoring Plan (GMP)**

Establish the baseline	Inventories of POPs production, use, trade, stockpiles, releases, and waste; monitoring complements inventories with measured concentrations.
Target priorities and risks	Environmental and human exposure evidence helps identify contaminated sites, pathways, and priority interventions.
Track progress and effectiveness	Repeated, quality-assured monitoring data helps assess trends; GMP data support Convention effectiveness evaluation under Article 16.

Monitoring to decision making



Reliable data + Sustained monitoring + Institutional uptake = Stronger NIP decisions

Current state of POPs data production and use in NIP countries: opportunities and challenges

Strengthening capacity to better produce and use POPs monitoring data

Persistent organic pollutants (POPs) are synthetic organic chemicals characterized by their exceptionally high persistence in the environment, potential for long-range environmental transport, bioaccumulation in humans and wildlife, and adverse effects on human health and ecosystem. Recognizing these risks, the Stockholm Convention on Persistent Organic Pollutants entered into force in 2004 with the objective of protecting human health and the environment from the harmful effects of POPs. In accordance with Article 7 of the Convention, Parties are required to develop and periodically update their National Implementation Plans (NIPs) describing how they will implement their obligations under the Convention. Since the Convention entered into force, the number of listed POPs has reached from the initial 12 POPs to 37 chemicals and groups of chemicals currently listed in its Annex. In this context, with financial support from the Global Environment Facility (GEF), technical support from the Basel and Stockholm Conventions Regional Centres, and the UNEP as the implementing agency, the project "*Global Development, Review and Update of National Implementation Plans (NIPs) under the Stockholm Convention (SC) on Persistent Organic Pollutants (POPs)*" supports selected countries in reviewing and updating their NIPs to address chemicals currently listed under the Convention. Experience from previous NIP development and update projects has highlighted significant differences in national technical and analytical capacities to monitor and analyze POPs. To better understand existing laboratory capacity, identify technical gaps, and inform future capacity-building activities, this questionnaire has been developed for the project participating countries. The information collected will help identify current analytical capabilities, training needs, infrastructure gaps, and opportunities for technical support, thereby strengthening national capacities for implementing the Stockholm Convention. The information provided will be treated confidentially and used solely to support project implementation, technical assistance, and capacity development. Should you have any questions regarding the questionnaire, please contact experts from your respective Regional Centre. **Please fill and submit this questionnaire by 31st July 2026**.

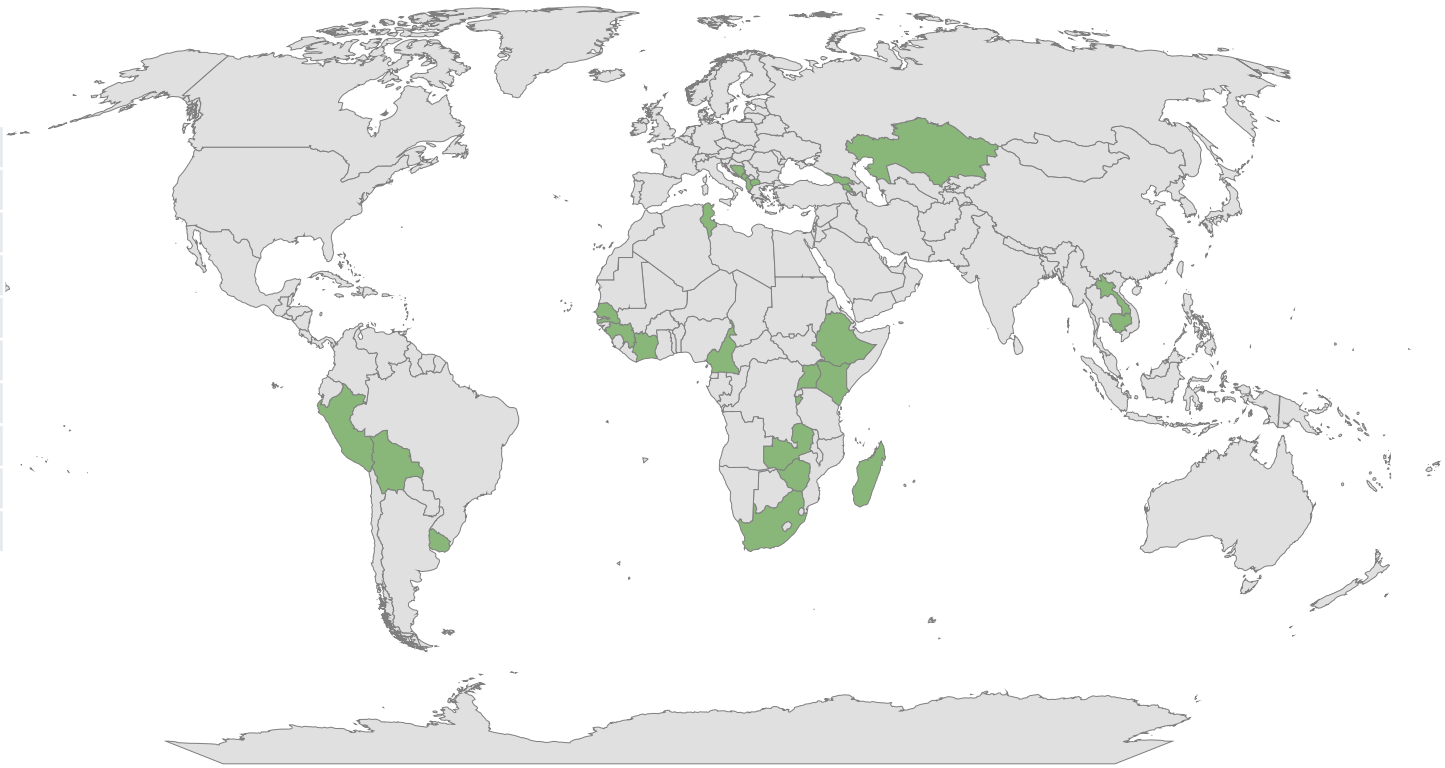
Purpose: Map laboratory infrastructure, analytical coverage, QA/QC, constrains, data use, and capacity building priorities to inform future POPs management

Current state of POPs data production and use in NIP countries

Results

32 responses from 29 countries

Albania	Ethiopia	Peru
Armenia	Georgia	Senegal
Bahamas	Guinea	Seychelles
Bosnia and Herzegovina	Kazakhstan	South Africa
Burundi	Kenya	Tunisia
Bolivia	Laos	Uganda
Cambodia	Madagascar	Uruguay
Cameroon	Maldives	Zambia
Côte d'Ivoire	Montenegro	Zimbabwe
Dominica	North Macedonia	



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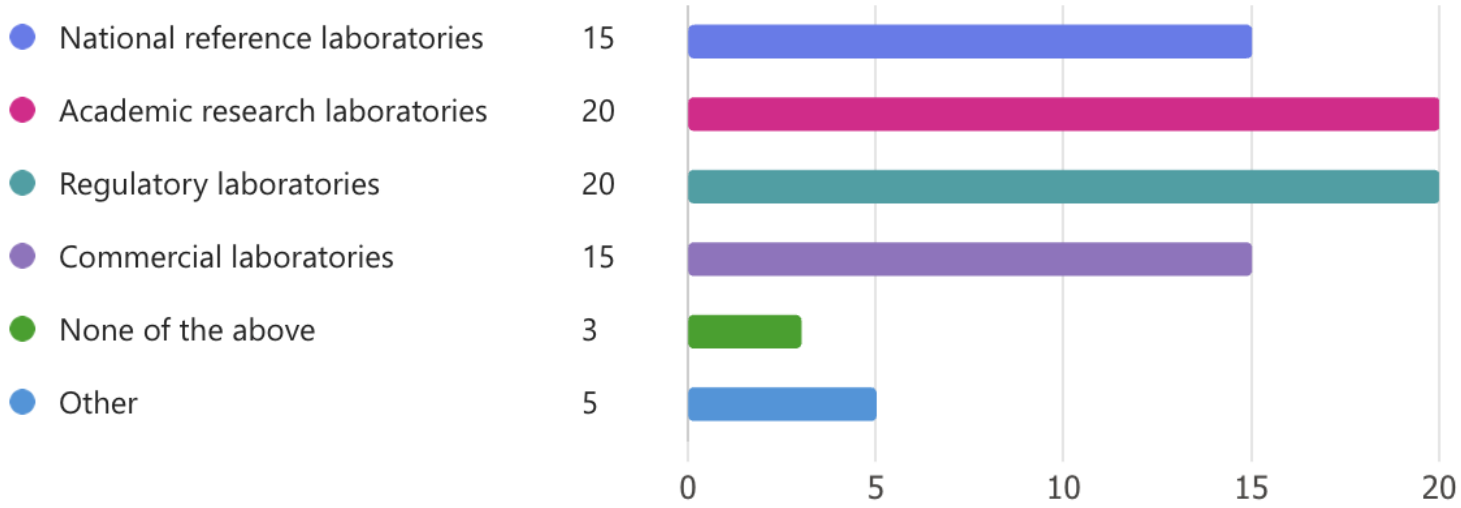
Algeria
Gambia
Malawi
Togo

Current state of POPs data production and use in NIP countries

Results

Types of existing laboratories across project countries to support the monitoring, sampling, and/or analysis of chemicals (including POPs)

A laboratory base exists across project countries with distributed capabilities

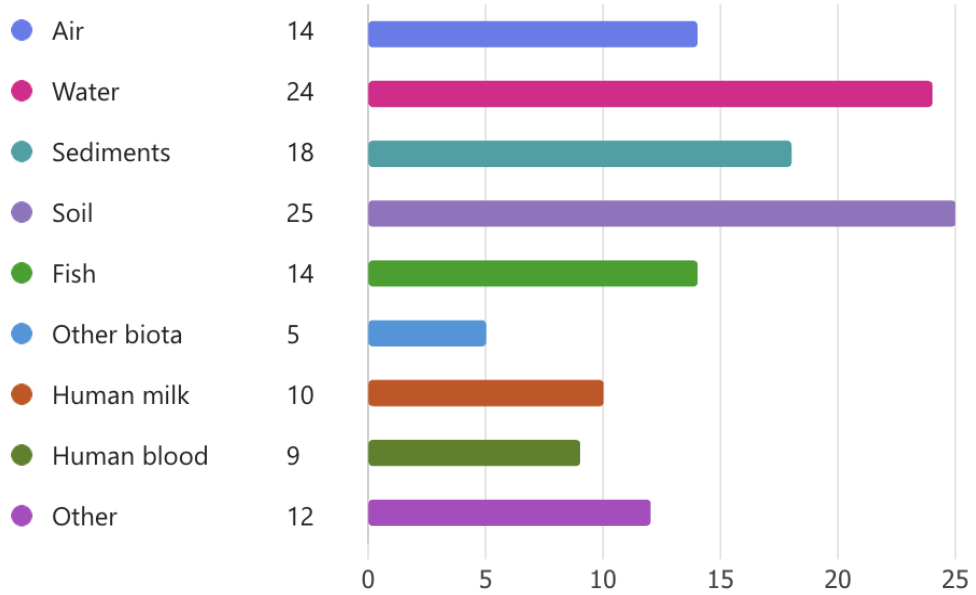


Current state of POPs data production and use in NIP countries

Results

Experience of labs in monitoring and analysis of environmental or biological matrices

Monitoring experience is concentrated across only certain matrices

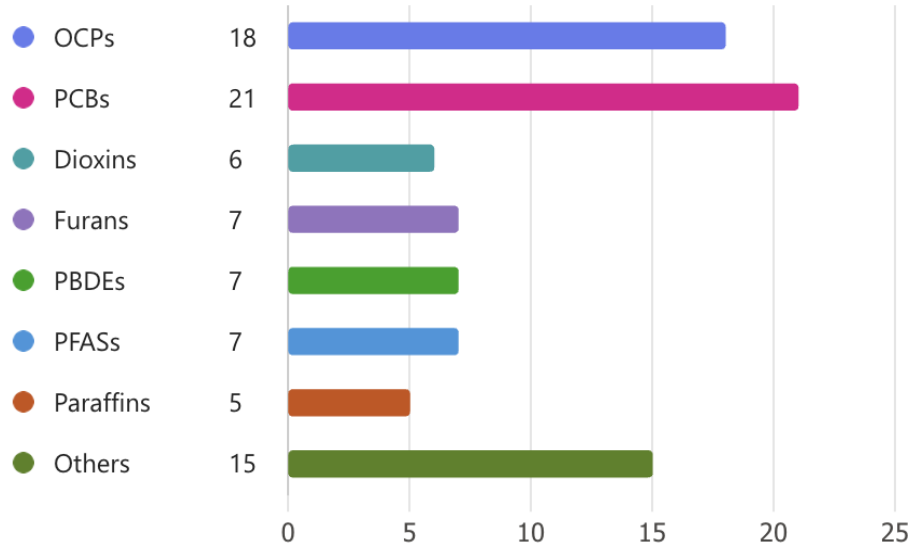


Current state of POPs data production and use in NIP countries

Results

Current capacity to analyze groups of POPs and other chemicals in project countries

Analytical capacity is uneven across the chemical groups

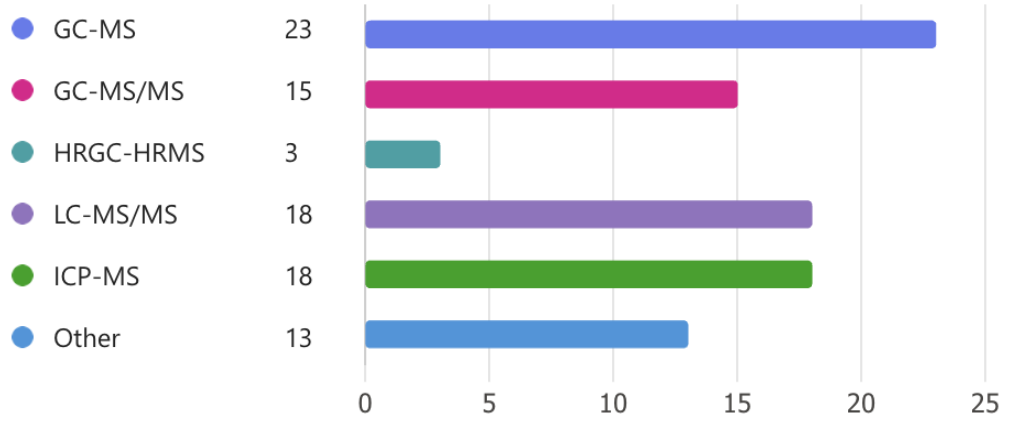


Current state of POPs data production and use in NIP countries

Results

Current analytical infrastructure to analyze groups of POPs and other chemicals in project countries

Infrastructure is there; fit-for-purpose analysis is another question

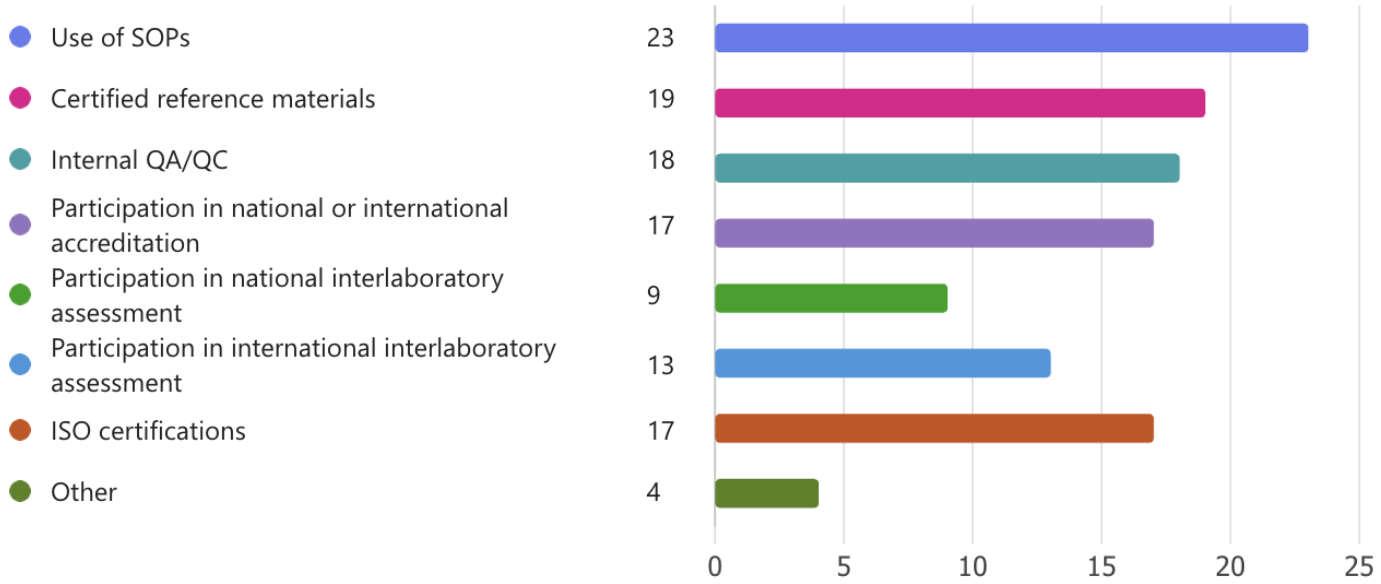


Current state of POPs data production and use in NIP countries

Results

Status of quality assurance and quality control (QA/QC) measures in labs

Data quality measures and infrastructure remains uneven across countries

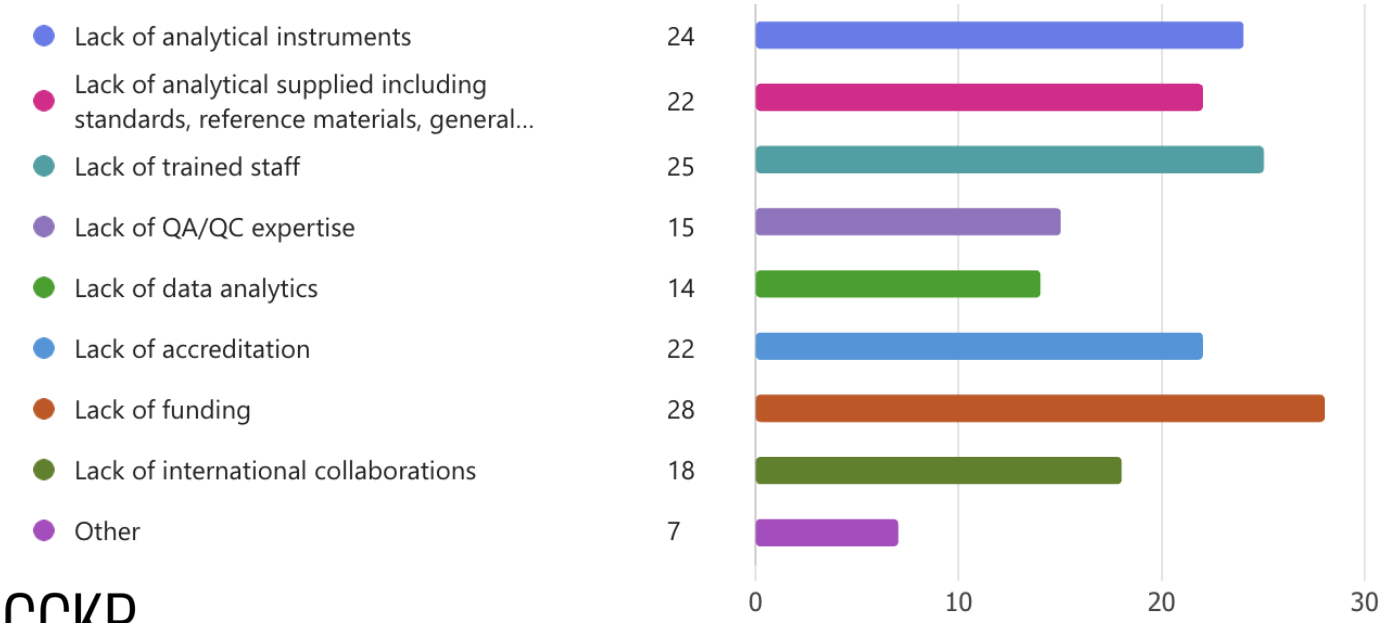


Current state of POPs data production and use in NIP countries

Results

Main gaps or constraints currently limiting country's laboratory capacity to conduct POPs monitoring and analysis

Capacity constraints are systematic and not isolated

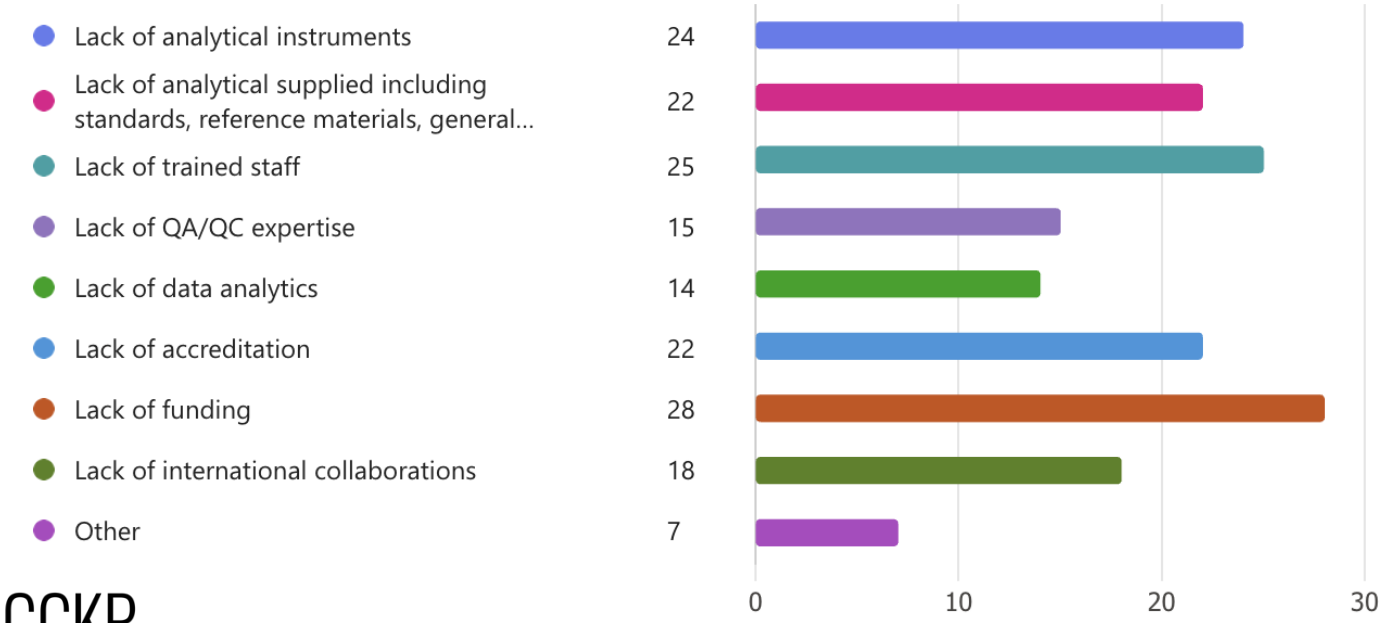


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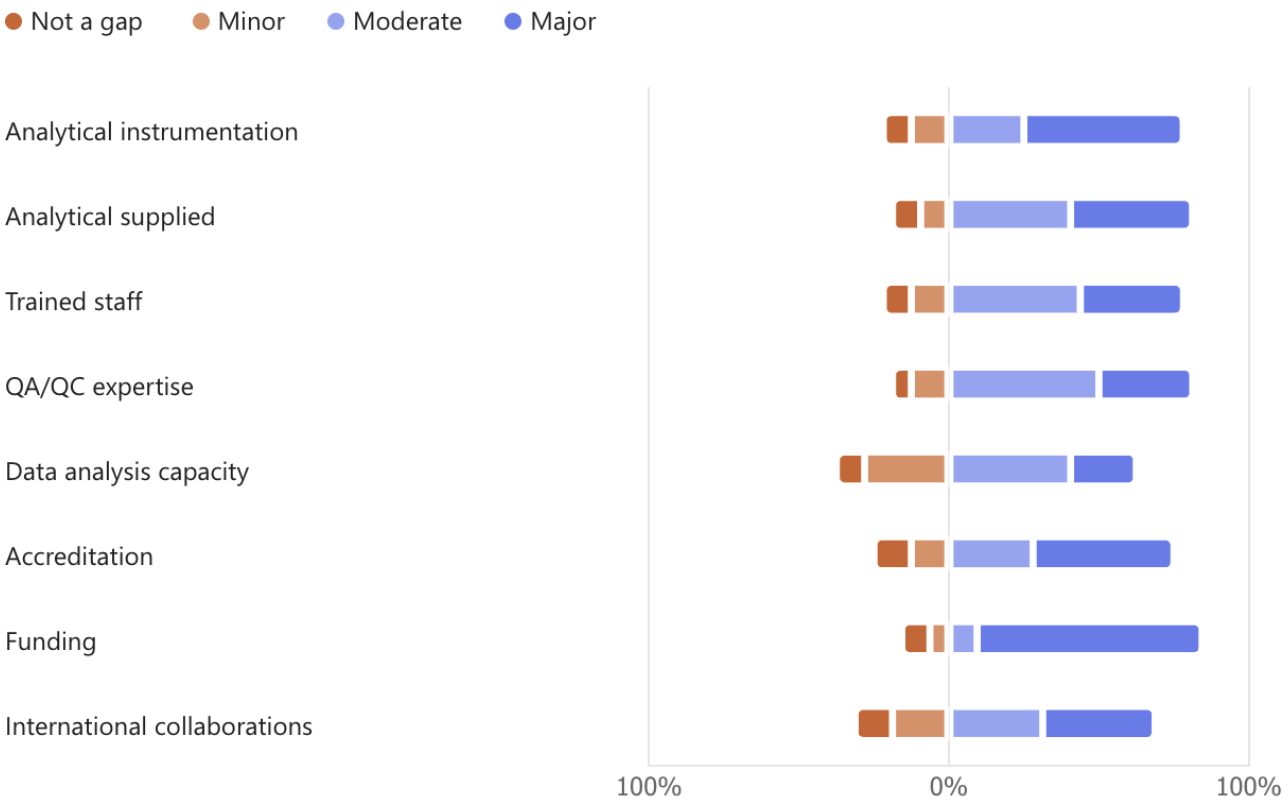


Current state of POPs data production and use in NIP countries

Results

Severity of gaps around analytical capacity

Instrumentation, Accreditation, and Funding

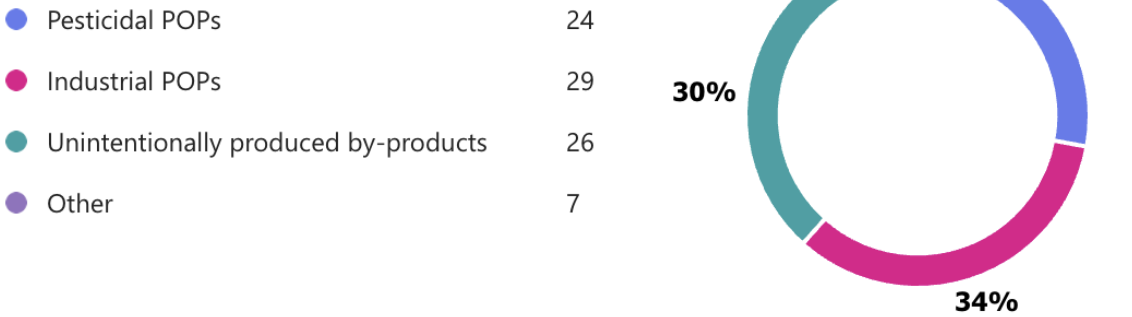


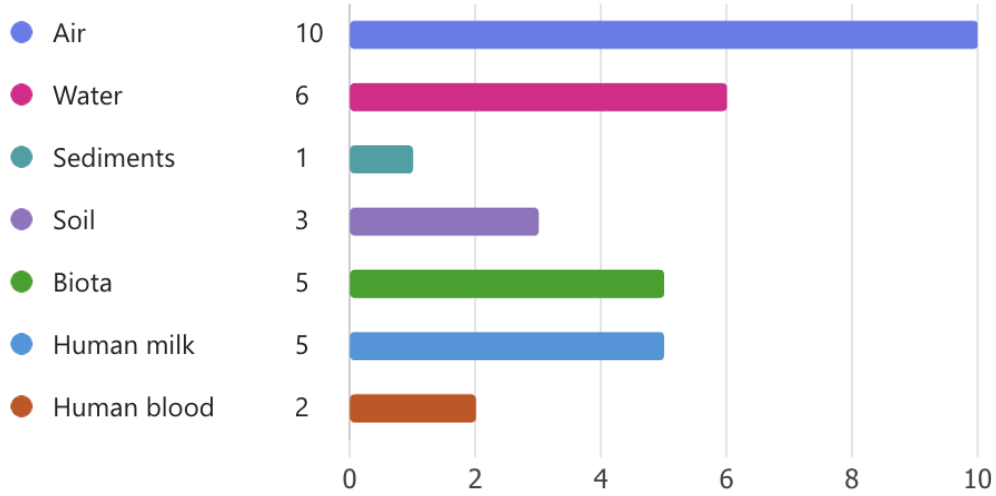
Current state of POPs data production and use in NIP countries

Results

Pressing needs for technical support across chemical categories and target matrices

Demand for support extends across POPs categories



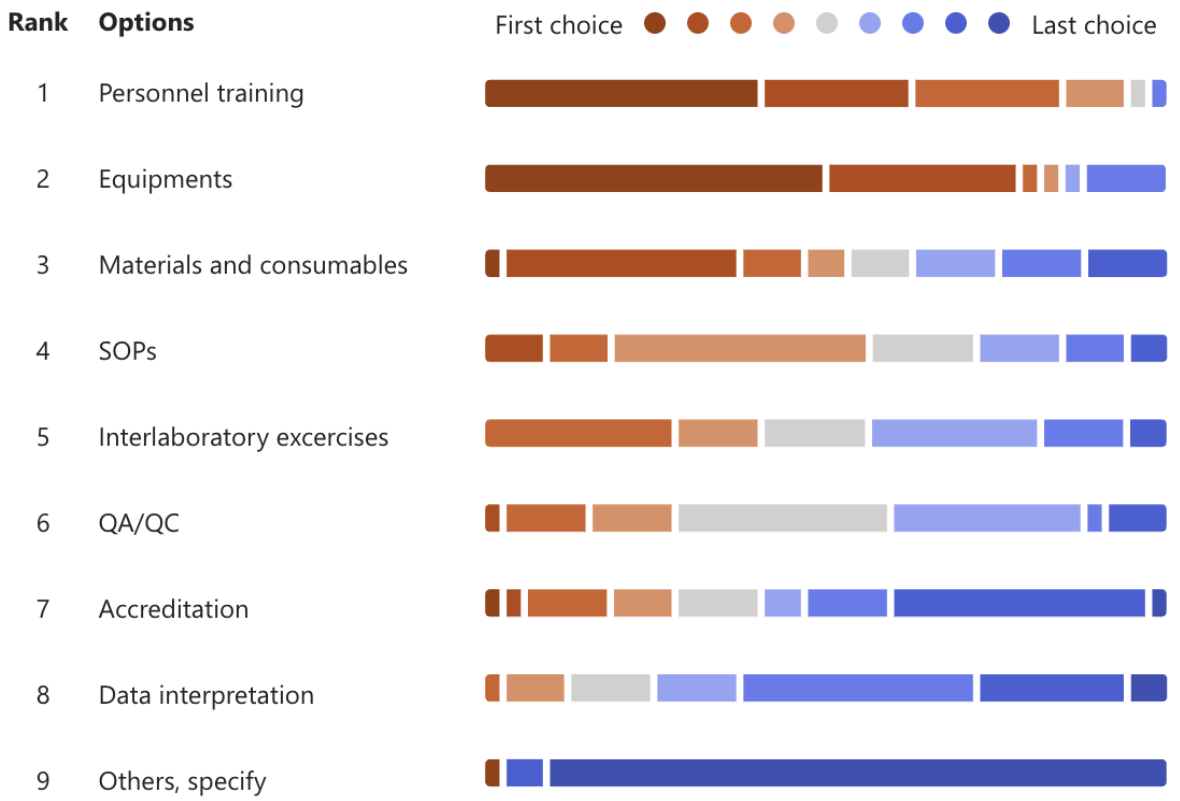


Current state of POPs data production and use in NIP countries

Results

What type of supports would be valued the most?

Personal trainings, Equipment, Materials, and Interlab. assessment

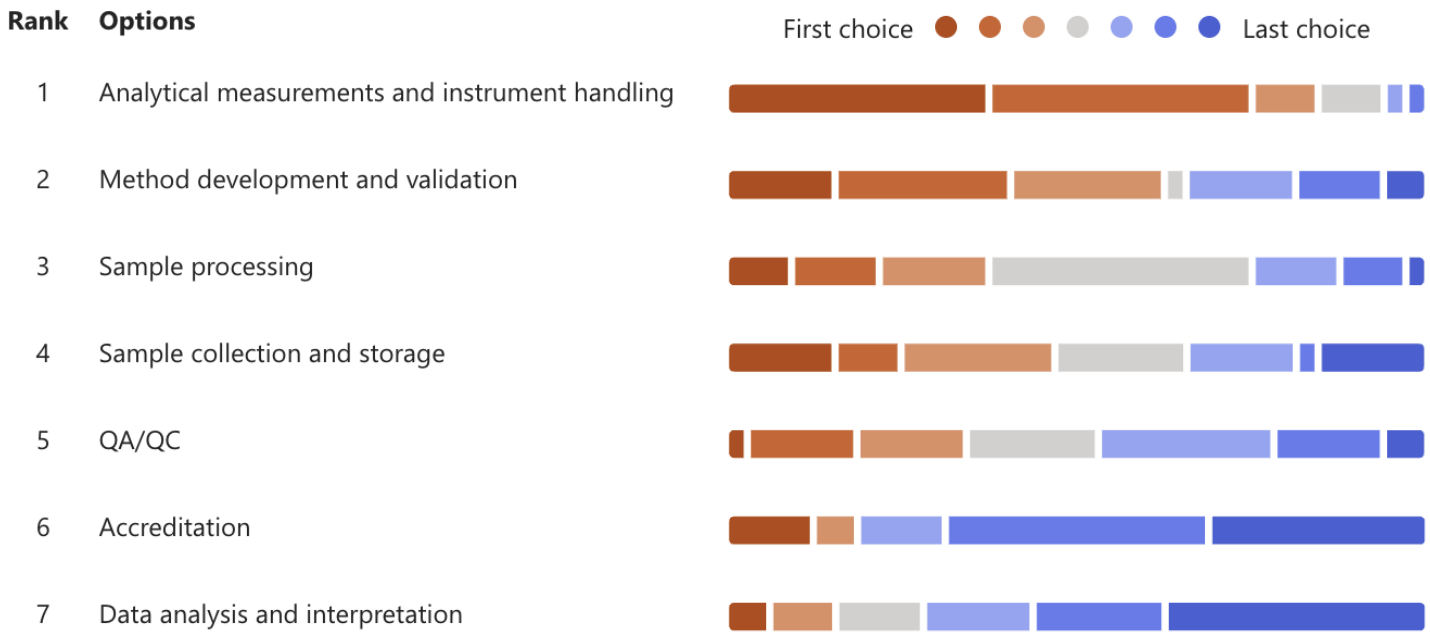


Current state of POPs data production and use in NIP countries

Results

What type of trainings would be valued the most?

Analytical measurements, method development, sample collection and processing

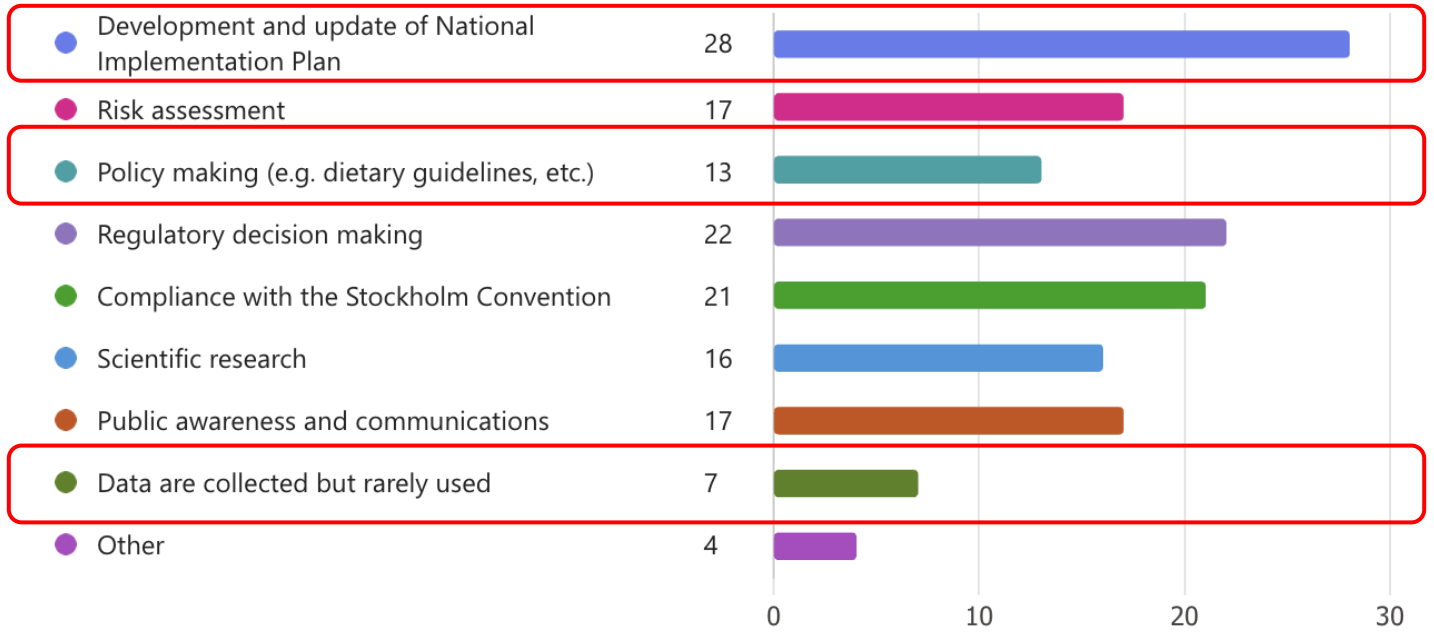


Current state of POPs data production and use in NIP countries

Results

Capacity gaps on turning measurements into decision making

Reported use in documentation is not the same as frequented influence on policy making

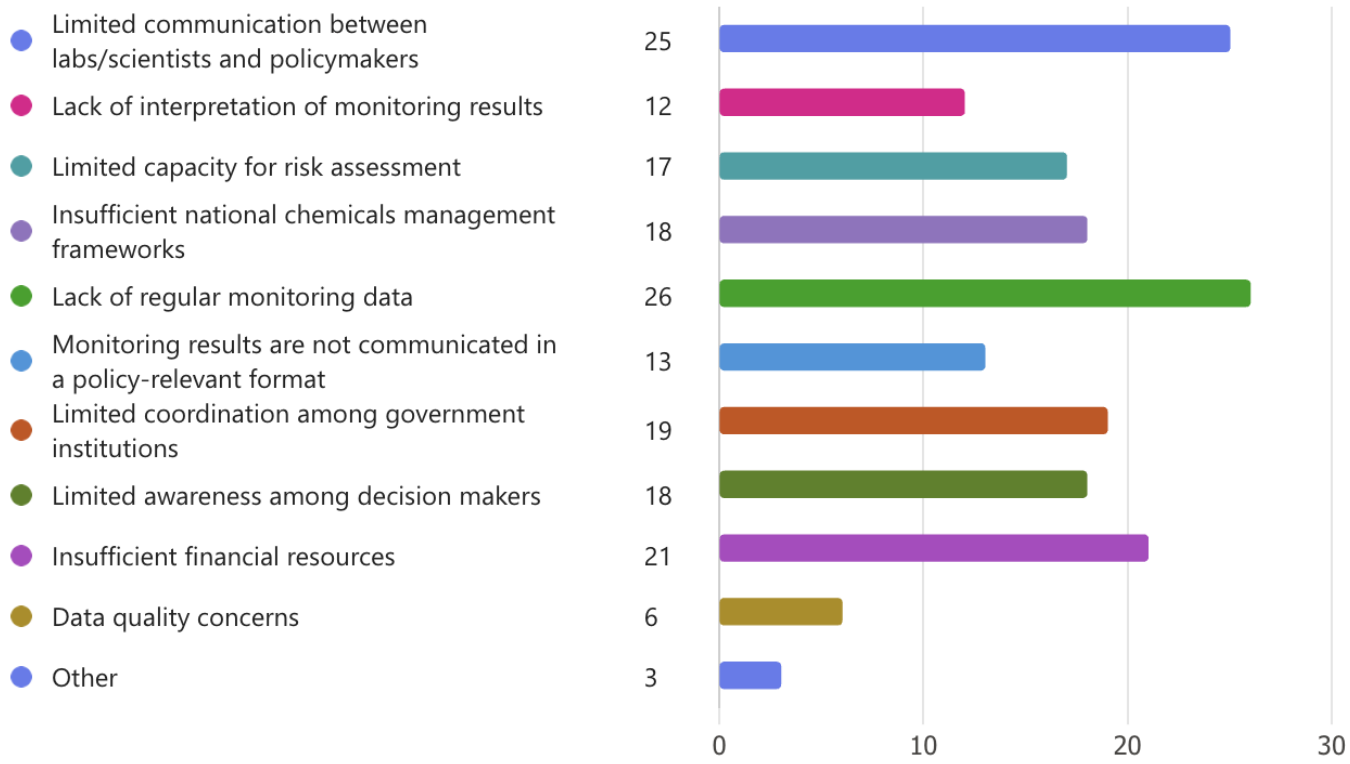


Current state of POPs data production and use in NIP countries

Results

Barriers on turning measurements into decision making

Irregular monitoring and Weak lab-policy communication

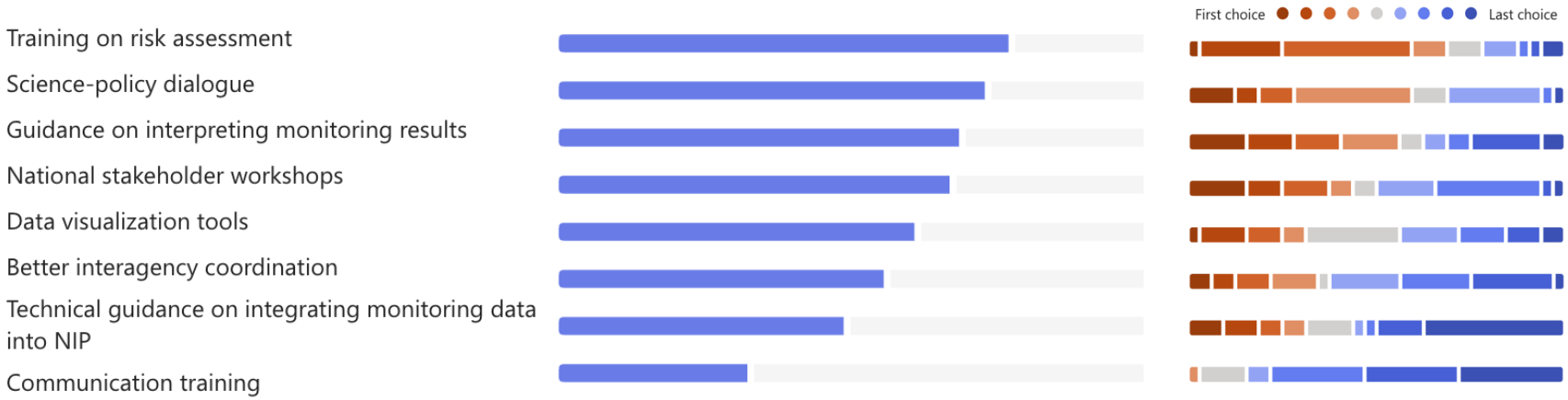


Current state of POPs data production and use in NIP countries

Results

What type of supports would be valued the most for effective use of data into policy making?

Training on risk assessment,
Science-policy dialogues,
Guidance on interpreting of results



Conclusions

Double capacity deficit

Capacity to produce	Capacity to use
• Robust monitoring • Analytical methods • Staff • Instrumentations • QA/QC • Funding and sustainable programmes	• Data management • Risk interpretation • Science-policy communication • Coordination and actionable reporting

How addressing these gaps would support the Stockholm Convention

Article 7	Article 15	Article 16
• More evidence-based NIP development, implementation, review and updating	• Better information to support national reporting on implementation measures	• Comparable monitoring evidence contributes to the Global Monitoring Plan and effectiveness evaluation.

Way forward

Data can transform chemicals management

- When observations are credible, comparable and linked to decisions

The gaps are both technical and institutional

- Equipment, staff, QA/QC matter so do continuity, interpretation and coordination

Capacity building must close the loop

- From reliable POPs monitoring to stronger NIPs, Convention implementation and global actions

Thank you

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