Appendix 5:

SURVEY ON ANALYTICAL CAPACITIES ON POPS MONITORING IN AFRICA

UN ENVIRONMENT SURVEY ON ANALYTICAL CAPACITIES ON POPS MONITORING IN AFRICA

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CONTENTS

CHAPTER 1
INTRODUCTION

BACKGROUND

Several African countries have ratified various Multilateral Environmental Agreements (MEAs) that address hazardous chemicals and wastes, these include the Basel Convention on Transboundary Movement of Hazardous Waste and their Disposal, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, the Minamata Convention on Mercury and the Stockholm Convention on Persistent Organic Pollutants.

The Stockholm Convention (SC) on Persistent Organic Pollutants (POPs) is an international treaty aimed at protecting human health and the environment from the threats posed by POPs. POPs are organic compounds containing carbon, hydrogen and halogens (or other compounds) that are resistant to environmental degradation through chemical, biological, and photochemical processes. POPs persist in the environment for long periods, are capable of long-range transport, accumulate in human and animal tissue and in food chains. They have negative impacts on human health and the environment.

Pursuant to Article 12 of the Convention, the Parties recognize that rendering of timely and appropriate technical assistance in response to requests from developing country Parties and Parties with economies in transition is essential to the successful implementation of this Convention. The Parties shall cooperate to provide timely and appropriate technical assistance to developing country Parties and Parties with economies in transition, to assist them, taking into account their particular needs, to develop and strengthen their capacity to implement their obligations under this Convention.

In this regard, technical assistance to be provided by developed country Parties, and other Parties in accordance with their capabilities, shall include, as appropriate and as mutually agreed, technical assistance for capacity-building relating to implementation of the obligations under this Convention. Hence, a survey through questionnaires was done in the participating countries to establish the strength and capacity building needs in each of the 7 participating countries. Therefore, this report provides an analysis of the survey findings.

OBJECTIVE

To establish appropriate arrangements for the purpose of providing technical assistance and promoting the transfer of technology to developing country Parties and Parties with economies in transition relating to the implementation of the Stockholm Convention on Persistent Organic Pollutants.

REPORT STRUCTURE

This report follows the structure as given below:

- Chapter 1 is the introduction
- Chapter 2 is the methodology
- Chapter 3 is the Survey findings from the questionnaires
- Chapter 4 is the recommendations and conclusion

CHAPTER 2
METHODOLOGY

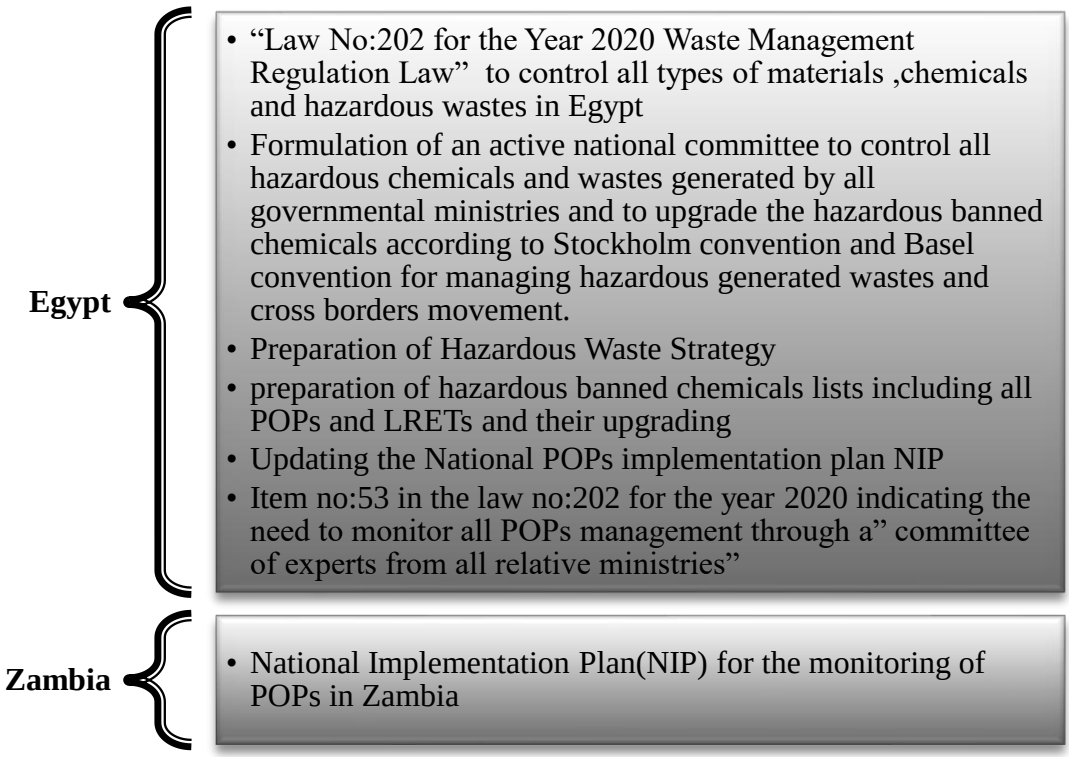
- Process
  - Meta data
  - Data Collection Techniques and Tools
  - Data Analysis
  - Limitations and Challenges

CHAPTER 3
SURVEY FINDINGS

This Chapter presents the responses obtained from all the seven countries who responded to the questionnaires. They will broadly follow the sections as laid out in the questionnaire.

3.1 REGIONAL POLICIES AND LEGAL FRAMEWORK FOR POPS MONITORING

When asked if their countries had put in place national policies on monitoring of POPs, only Egypt and Zambia answered in the affirmative. The policies listed are summarized in figure 1 below by country.



3.2 FUNDAMENTALS FOR SUSTAINABLE MONITORING OF POPS

When asked whether their country had ever undertaken any national, regional or international monitoring of POPs, all the countries apart from Burkina Faso answered in the affirmative. Figure 1 illustrates this.

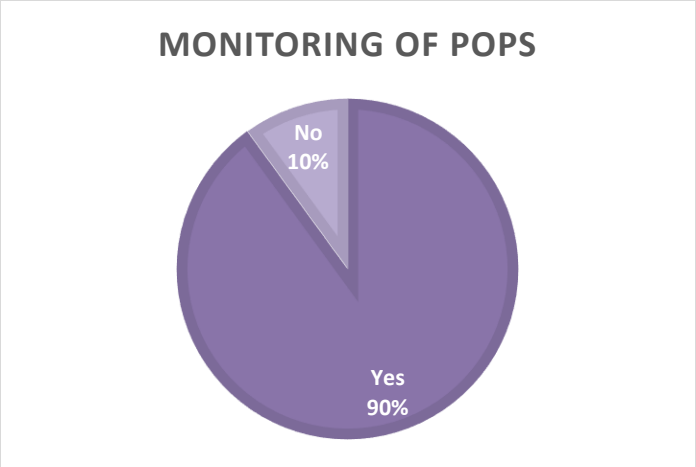


Figure 1: Monitoring of POPs at national, regional and international levels.

Below in table 1 are the various lists of projects where this monitoring has been undertaken.

Table 1: Projects on POPs Monitoring

Country	Projects on POPs Monitoring
1. Egypt-	a) Integrated Management of Chemicals PCBs, Cd, Cr (JICA) (2006-2008) b) Integrated Management of PCBs (MEDPOL) (2013-2017) c) Sound Management Of POPs (WB- GEF) Two stages (2010/2013)-2016-6/2021) d) Global Monitoring Plan (GMP1-GMP2) e) NIP National Implementation Plan of POPs Upgrading (UNEP-GEF)2021 f) Unintentional POPs management in Medical and electronic waste
2. Mali	a) MONET AFRICA, b) GMP1, c) UNEP MIROR STUDY, d) GMP2
3. Morocco	• GEMS Water • Mise en œuvre du plan national de surveillance des POPs issu du projet GMP2-Afrique
4. Senegal	a) MONET AFRICA b) GMP1 c) GMP2
5. South Africa	a) South Africa has not been able to update source inventories and release estimates of dioxins and furans due to lack of funding. The last inventories and release estimates of dioxins and furans were conducted in 2005 where South Africa has participated b) Orange-Senqu Water Resources Quality Joint Basin Survey 2 – Persistent Organic Pollutants and Metals Survey in 2010 and 2015 c) National Toxicity Monitoring Programme (NTMP) for monitoring of the national water resources under the Department of Water Affairs and Sanitation (DWAS takes place every month at selected hot spots in

	the country. The NTMP allows for sampling of water resources and analysis of selected POP
6. Tunisia	a) National program for the elimination of obsolete pesticide stocks (PASP-Tunisia) b) GMP1, c) UNEP MIROR STUDY, d) GMP2 e) Project elimination of PCB oils and contaminated equipment
7. Uganda	a) Global Monitoring Plan Phase 1 (GMP1) Project entitled, 'Strengthening the Implementation of the Global Monitoring Plan of Persistent Organic Pollutants in Eastern and Southern Africa Countries' b) Global Monitoring Plan Phase 2 (GMP2) Project entitled, 'Continuing Regional Support for the Persistent Organic Pollutants (POPs) c) Global Monitoring Plan (GMP) under the Stockholm Convention in the African Region'.
8. Zambia	a) Global Monitoring Plan (GMP) of the United Nations Environment.

When asked whether they had a national/regional database to record the data for POPs, only Egypt and South Africa reported that they did. Further response to questions under this section are presented in Table 2 below.

National database to record the data for POPs		
Question	**Egypt**	**South Africa**
1. Since when, was the database established?	It was initiated on 2008 Initiated by JICA and DANIDA agencies	2003 (water monitoring only)
2. How frequent are POPs data uploaded to the database?	As received from inventory sources in ministries	Monthly
3. Who is maintaining the database?	The IT unit at the Ministry of Environment	Resource Quality Information System (RQIS) from DWAS
4. Who are the main users of the database?	Currently and unfortunately the access to the data base is not achieved due to technical difficulty	Water quality managers, Governments departments, NGOs, Academia, Researchers

Further, South Africa was the only country which reported that there were annual/periodic reports prepared in their country to present the levels of POPs in humans and environment (water, air and biota). They stated that the Department of Water Affairs and Sanitation reported monthly and annually the results of NTMP water monitoring programmes to a Multi Stakeholder Committee on Chemicals Management (MCCM). However, when asked if there were any annual/periodic reports prepared in your country to present the levels of POPs in humans and environment (water, air and biota), they responded in the negative. Nonetheless, they stated that while this was not so for humans, sporadic research from various research institutions and academia did produce and

share their research outcomes with government officials by sending their articles through emails. They added that a large number of these research findings remain unreported. Lastly, they revealed that the Department of Environmental Affairs from time to time conduct inventories of selected POPs chemicals in terms quantities imported, exported, manufactured and sold.

With regards to the use of data generated from POPs monitoring activities ever supporting decision making in the countries, there were mixed responses. Uganda, Mali, South Africa, Senegal and Tunisia answered in the affirmative. The explanations given for the uses of this data to support decision making are given below:

- Data generated is used to inform the development of regulations on chemicals in the country. Also the above data was / is used to sensitize the country and stakeholders on the dangers of POPs. The Ministry of Environment had managed to establish a Waste Management Regulation Law, which covers the management and controlling strategies of hazardous wastes and chemicals as approved or banned according to the international conventions. The monitored values of PCBs and POPs was the base of the need for further monitoring program to evaluate the required steps to be taken by the country to ban the products or substances treatment generating those hazardous chemicals in the air, water, and food chain to reduce the increasing incidences of cancer and immunity related diseases. (Uganda)
- For enforcement and compliance of water use license and to assess whether legal water limits (thresholds) are complied with. (South Africa)
- For the Stockholm Convention implementation, drafting National Plan Action for POPs monitoring, policies making about POP regulation at national level (Senegal)
- A draft government decree on persistent organic pollutants underway; Second National Action Plan for the implementation of the Stockholm Convention (Tunisia)
- For the Stockholm Convention implementation, drafting National Plan Action for POPs monitoring, policies making about POP regulation at national level (Mali)

The reasons the remaining countries gave for not using the data for decision making were that it was still an embryonic field in the ministry and they did not have a program to collect scientific data to help authority to take good decisions.

3.3 NATIONAL ANALYTICAL CAPACITY

This section presents results related to the existing laboratory analytical capacity at national level. The countries were asked a series of questions on the types of laboratories present, samples analyzed and average staffing levels. Below are the findings beginning with figure 2 and table 2 which show the number of laboratories in each country and associated attributes.. The range was from none (Burkina Faso) to 23 (South Africa) with most being run by the government while only three countries reported having private and research institution owned laboratories. These facilities were manned by between four (Zambia) to 20 (Tunisia) technical staff who had been trained in POPs analysis. Their average monthly expenses were between 55,000 to 250,00 USD for each laboratory which were funded from a variety of sources including government budget, user fees, donor funds, project funds and in one case private finances. A few countries could not estimate how much the operational expenses were due to lack of data.

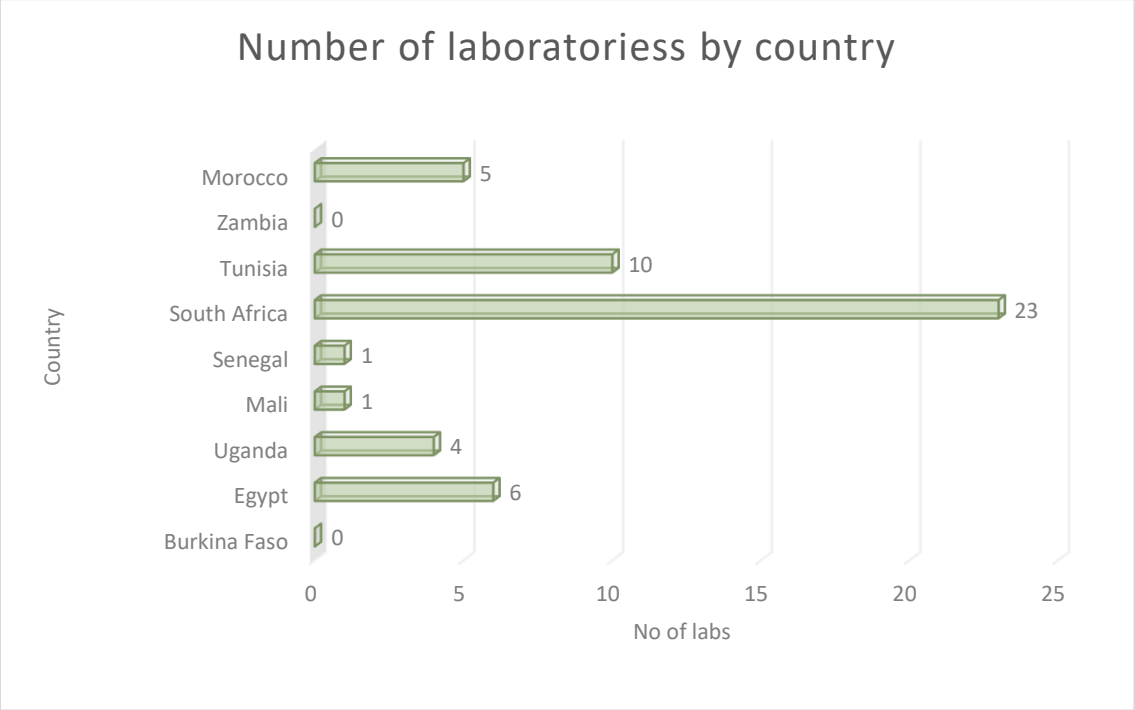


Figure 2: Showing number of laboratories by country.

Table 2 Showing attributes of the laboratories in each country

Country	No of labs	Type of lab	No of trained personnel *	Av operational costs/year	Source of funds
Egypt	6	Government	12	4 m Egyptian pounds	Internal
Uganda	4	Govt and Private	5	55,000 USD	Government
Zambia	1	Government	4	Unknown	Project funds
Morocco	10	Government	10	Unknown	Internal, Government
Mali	1	Government	13	250,000 USD	Government, research funds, user fees
Tunisia	10	Government/Private/Research Institutions	20	250,000 USD	Government, Private, User fees, Projects
South Africa	23	Government/Private/Research Institutions	5 (each lab)	2.5 m ZAR/lab	Government, Donors
Senegal	1	Research Center	10	Unknown	Government, Private, User fees, Projects

***Trained in POPs analysis**

It must be further noted that these are general laboratories and only a small number of laboratories are able to measure POPs. Even when POPs analysis is possible, not all laboratories can analyze for the full range of POPs; some laboratories can only measure POPs in water and sediments while other laboratories can only measure pesticides in human samples, such as blood or urine. This is shown in tables 2 and 3 which clearly show that most of the laboratories can only measure Pesticides and PCBs.

Table 3 Samples analyzed by country

Country	Abiotic-air	Abiotic-water	Abiotic - Soil, sediment	Biotic–human milk	Biotic Plants, fishes, crops, animal products (meat-butter …..etc.
Egypt	✓	✓	✓	✓	✓
Uganda	✓	✓		✓	
Zambia	✓	✓	✓	✓	✓ (fish)

Country	Abiotic-air	Abiotic-water	Abiotic - Soil, sediment	Biotic–human milk	Biotic Plants, fishes, crops, animal products (meat-butter …..etc.
Morocco	✓	✓		✓	
Mali	✓	✓	✓		
Tunisia	✓	✓	✓		✓
South Africa	✓	✓		✓	
Senegal	✓	✓	✓		

Table 3 Showing Types of POPs Analyszd

Country	**Types of POPs analyzed**				
	Pesticides	***PCBs***	***Dioxins***	***PFOS***	***Others Dioxin like PCBs, PFAS,***
Egypt	✓	✓	✓	✓	
Uganda	✓	✓			
Zambia	✓	✓			
Morocco	✓	✓			✓
Mali	✓	✓			
Tunisia	✓	✓			✓ (HAP)
South Africa	✓	✓		✓	
Senegal	✓	✓			

The countries also reported that the data on POPs in human and in the environment generated in each country per year depended on which samples were analyzed. Cases in point are Egypt where data for 150 food samples data was generated annually while in Morocco, there were 200 and 300 water and human samples' data collected respectively.

This data was used for export and import activities, environmental studies, internal and external governmental licenses, establishment of corrective measures to be taken by the government in different developmental activities to minimize their negative impacts due to their persistence and toxicity. It is useful in informing policy makers, research, academia and other training institutions. These data also represent an interpretation of the POPs trends and the long-range transport of the detected POPs. Policy formulation and legislation. To assess the extent of environmental pollution and impact on health and environment. raising awareness among stakeholders

Most countries indicated that the laboratories described had the mandate for POPs monitoring in the country and that this activity had been mainstreamed in the national programs. They further outlined the role of each laboratory as follows:

- ✓ *"All imported and exported food ingredients are analyzed,*
- ✓ *Research projects, and the regular monitoring for POPs to abide with the sponsored projects from donor organizations,*
- ✓ *Continuous, routine analysis of POPs.*
- ✓ *Each laboratory is supposed to carry out monitoring and analysis of pesticides, inclusive of POPs in their laboratory analytical scope,*
- ✓ *Carry out sampling when required to study pesticide usage, application / POP contamination."*

When asked whether they had any plan (s) for data generation in the future, 95% of the countries answered in the affirmative. These plans included the following verbatim responses:

" - Yes, we planned to monitor the air ambient and water also to look at for foods.

- *There is a POPs analysis plan for food and products in QCAP Lab. And all POPs analysis Labs and through our NIP update-There is national Plan for POPs Monitoring in In the New Law NO (202) Year 2020.*
- *Yes, a plan is in place to assess and monitor the levels of chemical residues and environmental contaminants in different matrices on a yearly basis.*
- *Yes, we need to develop a national database and/or repository for national monitoring programmes to have a national coverage at all the province in various matrices".*

3.4 CAPACITY BUILDING NEEDS

It is very clear from the responses that all the countries unanimously agree that there is need for Capacity Building to enable them participate in the future global monitoring plans.

Key elements for sustainability of the POPs monitoring programs are:

1. Laboratories and trained personnel which should be sufficient to meet the needs of the countries. Increase scope of laboratories to analyze new POPs and increase instruments of analysis. This is so as to achieve the international obligations of the POPs conventions. And enhance control over illegal trade of POPs containing chemicals and products;
2. Accredit POPs analysis Laboratories-
3. A data management system that enables the continuous monitoring of POPs which is vital to take the necessary corrective actions for reduction of the negative impacts of those persistent chemicals. This will include computers and other data processing software;
4. There is also need to establish laboratories' networks at national, regional and international levels to assist us in the production of scientific data and analysis of POPs in cases where in-country capacity is insufficient.
5. Guaranteed operational funds which should be available to ensure that the analyses are done on a continuous basis and not just rely on donor funding for specific projects.
6. Continuous technical training in method development and new analytical techniques for laboratory personnel across the countries. Study trips within Africa and abroad should be encouraged in order to have specialized training and exchange of experiences/best practices.

To summarize the capacity building needs are this quotation from one of the respondents:

"Support is highly required in the area of Laboratory Quality Management System, to have the laboratory accredited according to ISO/IEC 17025:2017 Guidelines for Testing and Calibration Laboratories in order to have our findings be internationally recognized and boost lab confidence in technical analysis. Technical and financial assistance are very important to reach our goal".

CHAPTER 4
RECOMMENDATIONS AND CONCLUSIONS

The survey was successfully conducted covering 12 institutions across nine different countries. It revealed that while some work is being done on POPs monitoring in the countries, this is driven by donor funded projects highlighting the need to mainstream this activity in routine national programs. Further, the laboratories present in the countries still require capacity building in the scope of samples as well as the suite of POPs currently being analyzed.

It is thus recommended that the countries designate at least one government laboratory which will be fully fitted with equipment, rained personnel and sufficient operational funds to analyze the full suite of POPs on a routine basis. There should also be established a functional network of relevant stakeholders to whom the monitoring data will be shared to ensure that its effectively utilized for policy formulation, awareness raising and trend analysis in addition to any other needs present in each country.

Lastly, a training program should be developed at regional level in POPs analysis which will be implemented by academic and research institution to ensure that this knowledge is shared to a wider range of technical experts.

Given that Monitoring of POPs is a very labor intensive and expensive venture, it is imperative that this program is sustained across the national, regional and international levels by establishing a clear legal framework and functional financial support mechanism to support the maintenance of equipment and instruments as well as capacitate the technical staff involved in the work.

ANNEXES

ANNEX 1: COUNTRIES THAT RESPONDED

1. Burkina Faso
2. Egypt
3. Uganda
4. Senegal
5. South Africa
6. Tunisia
7. Mali
8. Morocco (three institutions)
9. Zambia

ANNEX 2: BLANK MASTER DATA ENTRY TEMPLATE

VARIABLES	SUB-VARIABLES	SENEGAL	ZAMBIA	UGANDA	MALI	EGYPT-HEALTH	EGYPT-ELECTRICITY	MOROCCO WATER	MOROCCO HEALTH	MOROCCO ENERGY	BURKINA FASO	SOUTH AFRICA	TUNISIA
A. METADATA	**Ministry**												
	Department												
	Contact Point												
	Email:												
	Telephone:												
A. FUNDAMENTALS FOR THE SUSTAINABLE MONITORING OF POPS	**1. Has your country ever undertaken any national, regional or international monitoring of POPs?**												
	2. Do you have a national/regional database to record the data for POPs?												
	a. Since when, was the database												

VARIABLES	SUB-VARIABLES	SENEGAL	ZAMBIA	UGANDA	MALI	EGYPT-HEALTH	EGYPT-ELECTRICITY	MOROCCO WATER	MOROCCO HEALTH	MOROCCO ENERGY	BURKINA FASO	SOUTH AFRICA	TUNISIA
	established?												
	b. How frequent are POPs data uploaded to the database?												
	c. Who is maintaining the database?												
	d. Who are the main user of the database?												
	3. Is there any annual/periodic reports requested in your country to present POPs in humans and in the environment? (if yes, clarify)												
	4. Has data gener												

VARIABLES	SUB-VARIABLES	SENEGAL	ZAMBIA	UGANDA	MALI	EGYPT-HEALTH	EGYPT-ELECTRICITY	MOROCCO WATER	MOROCCO HEALTH	MOROCCO ENERGY	BURKINA FASO	SOUTH AFRICA	TUNISIA
	ated from POPs monitoring activities ever supported decision making in your country? Please explain answe												
B. NATIONAL ANALYTICAL CAPACITY	**1.** Total number of POPs analytical laboratories available in your country												
	2. Type of laboratory												
	3. Type of matrices analysed												
	4. Type of POPs analysed												
	5. Average number of technical												

VARIABLES	SUB-VARIABLES	SENEGAL	ZAMBIA	UGANDA	MALI	EGYPT-HEALTH	EGYPT-ELECTRICITY	MOROCCO WATER	MOROCCO HEALTH	MOROCCO ENERGY	BURKINA FASO	SOUTH AFRICA	TUNISIA
	staff in each lab												
	6. Annual Operational Costs												
	7. Sources of Financial Support												
	8. How much data on POPs in human and in the environment is generated in your country per year?												
	9. What is this data used for?												
	10. Do you have any plan for data generation in the future? If yes, please clarify												
D. CAPACITY BUILDING HISTORY	1. Has your countr												

VARIABLES	SUB-VARIABLES	SENEGAL	ZAMBIA	UGANDA	MALI	EGYPT-HEALTH	EGYPT-ELECTRICITY	MOROCCO WATER	MOROCCO HEALTH	MOROCCO ENERGY	BURKINA FASO	SOUTH AFRICA	TUNISIA
AND ACHIEVEMENTS	y every received any capacity building? If so, please describe												
	2. Did you find it helpful?												
	3. Do you think the analytical capacity should be maintained in your country? Why?												
	4. What do you think are the indicators to measure whether you have improved your analytical capacity?												
E. CAP	1. Do you												

VARIABLES	SUB-VARIABLES	SENEGAL	ZAMBIA	UGANDA	MALI	EGYPT-HEALTH	EGYPT-ELECTRICITY	MOROCCO WATER	MOROCCO HEALTH	MOROCCO ENERGY	BURKINA FASO	SOUTH AFRICA	TUNISIA
ACITY BUILDING NEEDS	have a national capacity building plan for the next 5-10 years? If so, please describe.												
	2. What is your national goal of capacity building in the next 5-10 years?												
	3. What support has your country secured to facilitate this capacity building plan?												
	4. What support is needed externally?												
F. OTHER THO	Please provide any comments												

VARIABLES	SUB-VARIABLES	SENEGAL	ZAMBIA	UGANDA	MALI	EGYPT-HEALTH	EGYPT-ELECTRICITY	MOROCCO WATER	MOROCCO HEALTH	MOROCCO ENERGY	BURKINA FASO	SOUTH AFRICA	TUNISIA
UGHTS	you may have.												

UN ENVIRONMENT SURVEY ON ANALYTICAL CAPACITIES ON POPS MONITORING IN AFRICA

United Nations Environment Programme in collaboration with Zambia Environmental Management Agency (ZEMA) implements the GEF funded project titled "Continuing Regional Support for the POPs Global Monitoring Plan under the Stockholm Convention" in Zambia.

Among the activities, a survey is conducted to advance the understanding of analytical capacity and capacity building needs for the implementation of Persistent Organic Pollutants (POPs) plan in the Africa Region, including related plans.

The findings will be presented for consideration by the Conference of the Parties in planning of POPs global monitoring activities under the Stockholm Convention beyond the 2nd phase of GEF funded project.

You are kindly invited to complete the attached questionnaire and forward to Mr. Christopher Kanema (email: ckanema@zema.org.zm) before 15 October 2019.

We look forward to receiving your response and thank you in advance for your time and consideration.

In case you have any questions, please do not hesitate to contact us via Mr. Gamini Manuweera gamini.manuweera@un.org, or Mr. Christopher Kanema (ckanema@zema.org.zm) or wdzekedzeke@zema.org.zm.

Metadata

Country	
Ministry	
Department	
Contact Person	
Email:	
Telephone:	

National policies and legal framework for pops monitoring

2a. Has your country put in place national policy on monitoring of POPs?	
Yes ○	No ○
If yes, please list the policies	
2b. Has your country put in place legal framework for monitoring of POPs?	
Yes ○	No ○
If yes, please list the specific legislation and related details	

Fundamentals for the Sustainable monitoring of POPs

Has your country ever undertaken any national, regional or international monitoring of POPs?	
Yes ○	No ○
If yes, please list the projects	

Do you have a national database to record the data for POPs?

Yes ○	No ○
If yes, please answer the questions below:	
Since when, was the database established?	
How frequent are POPs data uploaded to the database?	
Who is maintaining the database?	
Who are the main users of the database?	

Are there any annual/periodic reports prepared in your country to present the levels of POPs in humans and environment (water, air and biota)?	
Yes ○	No ○
If yes, please specify the type of reports and scope	
Has data generated from POPs monitoring activities ever supported decision making in your country?	
Yes ○	No ○
Please explain	

National Analytical Capacity

Total number of POPs analytical laboratories available in your country				
Type of Laboratory				
Public/Governmental ☐	Private ☐	Research facility ☐		
Type of matrices analyzed in your country				
Abiotic – air ☐	Abiotic – water ☐	Abiotic – other (please specify) ☐	Biotic–human milk ☐	Biotic – other (please specify) ☐
Types of POPs analyzed:				
Pesticides ☐	PCBs ☐	Dioxins ☐	PFOS ☐	Others ☐
Average number of technical staffs trained on analyzing POPs in each lab				
Annual operational costs				
Sources of financial support				
How much data on POPs in human and in the environment is generated in your country per year?				
What are these data used for?				
Do laboratories have a national mandate for monitoring POPs?				
Yes ○		No ○		
If yes, what is the role of each laboratory?				

Has the POPs monitoring been mainstreamed into national program?
Yes ○ | No ○
If yes, provide details
What key elements in place for sustainability of POPs monitoring?
Do your country have any plan for data generation in the future? If yes, please describe

Capacity building history and achievements

Has your country ever received any capacity building support in POPs monitoring? If so, please describe
Did it contribute to sustainable monitoring of POPs? If yes, please describe
Do you think the analytical capacity should be maintained in your country? Why?
List the indicators to measure improvements of analytical capacity.

Capacity Building Needs

Do you have a national capacity building plan for laboratory improvement for the next 5-10 years? If so, please describe.
What is your national goal of capacity building?
What support is needed externally?

Remarks if any

Please provide any additional comments related to national capacity for POPs monitoring.

----------Thank you----------

You successfully completed this survey.

UN Environment would like to thank you for your contribution and support.