

## **7. Strategy, process and draft structure for regional monitoring reports**

### **7.1 Introduction**

In order to assist in the elaboration of the GMP, it would be useful to consider the strategy, processes and structure of the first regional monitoring reports. The text in this chapter has been prepared to assist the Regional Organization Groups (ROGs) while they are planning and setting up their information gathering activities and preparing their report and is based on the outcome of the first meeting of the Technical Working Group. More information on the roles and responsibilities of the ROGs can be found in the report of the first meeting of the ad hoc Technical Working Group (UNEP/POPS/TWG.1/6). Perhaps we should refer to the GMP Implementation Plan for the First Evaluation ???)

### **7.2 Background**

In the absence of an existing comprehensive discussion on the structure of the reports, the draft structures outlined below are based upon an examination of the objectives of Article 16 of the Stockholm Convention and of the GMP, together with a consideration of how other initiatives have approached similar tasks. Although a number of regional and global monitoring programmes have been established to report on the presence of POPs in the environment, there is very little previous experience of POPs monitoring designed to help evaluate the effectiveness of a legally binding international agreement. The 1998 Protocol on POPs under the Convention on Long-range Transboundary Air Pollution (which entered into force in October 2003) (UNECE 1998) contains in Article 10 a requirement to review the sufficiency and effectiveness of the obligations taking into account the effects of the deposition of POPs. The first review was completed in 2005 (UNECE, 2005).

POPs have been included in a number of monitoring programmes established to support international pollution prevention agreements, such as the periodic assessments for the Baltic Sea under the 1992 Helsinki Convention (e.g. HELCOM 1996) and the Joint Assessment and Monitoring Programme under the 1992 Oslo and Paris Conventions for the Protection of the Marine Environment of the North-East Atlantic (OSPAR 2000). Monitoring to support action is also envisaged in a number of UNEP's Regional Seas Monitoring and Assessment Programmes and Action Plans with a varying degree of implementation. Examples include the Barcelona Convention's Mediterranean Action Plan; and, the Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region. Resulting assessments are published under the UNEP Regional Seas Reports and Studies Series. A North American monitoring and assessment programme which will include the current 12 POPs in the Annex to the Stockholm Convention is being developed in Canada, Mexico and the United States (CEC 2002).

In addition, a number of global and regional assessments of the state of the environment (but not linked to pollution control agreements) have included POPs. Examples include: the various marine environment assessments undertaken by Group of Experts for the Scientific Assessment of Marine Pollution (e.g. GESAMP 2001); and the assessments undertaken for the circumpolar Arctic by the Arctic Monitoring and Assessment Programme (AMAP 2002- 4), and for Europe (EEA 1998) as well as for the Third UNEP Global Environmental Outlook (GEO-3). Other programmes have included a regional or global survey of the levels of certain POPs in particular media. Examples are the Global International Waters Assessment (GIWA 2000); the International Mussel Watch Project (e.g. Farrington and Trip, 1995; O'Connor, 1998; and Tanabe, 2000); and, surveys of certain organochlorines (including PCB, PCDD and PCDF) in food and in human milk (GEMS/FOOD 1997, GEMS/FOOD 1998, van Leeuwen and Malisch. 2002). More recently, UNEP has implemented the GEF Regionally Based Assessment of Persistent Toxic Substances (UNEP, 2003).

To identify where existing suitable monitoring data are not available, two important tools are the Regionally Based Assessment of Persistent Toxic Substances, and the fifth edition of the Master List of Actions on the Reduction and/or Elimination of releases of POPs (UNEP/POPS/INC.7/INF/15).

### **7.3 Outline of the strategy for the monitoring report**

The GMP for POPs will be comprised of regional organizational elements. Regional information gathering and preparation of the regional monitoring report will be planned, organized, and implemented on a regional basis following an agreed framework.

Regional monitoring reports, again following an agreed format, would provide the basis for one of the elements of the Secretariat's compilation for the effectiveness evaluation; the other two being the national reports submitted by Parties pursuant to Article 15, and the non-compliance information provided pursuant to the procedures established under Article 17.

### **7.4 The regions**

A number of options have been considered to provide the basic regional structure for the programme. In setting up the regions, care should be taken that they provide an adequate basis for generating, collecting, reporting and presenting the data. It would seem that the best way to achieve this is to form the regions as geographical entities. This would also facilitate evaluation of regional and global environmental transport of POPs. To keep the number of regions to a manageable figure, while maintaining the geographical basis, it has been proposed to use for the purpose of the first monitoring report only the following regional distribution: North and Central America including the Caribbean; Western, Central and Eastern Europe (including the whole UN-CEE region); West, South and South-eastern Asia; South America; Africa; and the region of Australia, New Zealand and the Pacific Islands. Information from the Arctic will be incorporated in the appropriate regions (North and Central America including the Caribbean as well as Western and Central Europe and Eurasia. The South America region and the region of Australia, New Zealand and the Pacific Islands will approach the relevant Antarctic institutions for information from the Antarctic. In setting up this structure the Secretariat would need to work in consultation with the members of the TWG to ensure coordination and avoidance of overlaps between regions.

Within each region, all activities would be under the direction of a Regional Organization Group (ROG). Some details about the roles and responsibilities of this group are given below. Sub regional arrangements that take into account linguistic, political and geophysical considerations could be introduced to further support the organization of the work.

Twinning and partnerships between regions would be encouraged whenever possible.

### **7.5 Regional strategy for information gathering**

A ROG will be established in each region to be responsible for implementing the global guidance document and the GMP implementation plan within that region, taking into account regional realities. The regions will be the operational units for data and information gathering, analysis, and preparing the regional monitoring report. The Secretariat and the appropriate TWG members for each region will set up appropriate arrangements<sup>1</sup> with due consideration of the existing capacities in each region for the establishment of the organization groups and networks. As far as possible, electronic communication means would be used to achieve the work. The ROGs should be active as soon as possible to ensure that they can make significant progress with their work.

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<sup>1</sup> Arrangements might include such issues as: establishing regional teams to prepare and finalized the regional monitoring report; regional networks of experts for drafting parts of the report; formal agreements on exchange of data and information; development of reference materials; coordinating inter-calibrations; twinning between laboratories etc.

The duties of the ROGs would include *inter alia*:

- Establishing their membership;
- Structuring of the regional monitoring network;
- Organizing sampling and analytical arrangements;
- Ensuring compliance with protocols for QA/QC, sample collection, analytical methodologies; data archiving and accessibility; and for trend analysis methodologies;
- Maintenance of interaction with other ROGs as appropriate;
- Developing elements to encourage capacity building; and,
- Identifying where existing suitable monitoring data are and are not available.

In the following paragraphs the process is outlined in some detail.

The ROGs, with the aid of the Secretariat, would elaborate and finalize the work of the TWG and Secretariat to identify possible contributing programmes from each region and to complete this work as soon as possible after they have been established.

The ROGs should proceed to examine and if necessary adjust the work of the TWG in applying the criteria previously established to known programmes in each region. The collective output of the ROGs is to identify a mix of existing programmes and activities that can deliver the required data and or information without enhancement, and those that could contribute following a specified degree of capacity enhancement. The ROGs will review this output in terms of the degree of regional coverage and decide upon whether and what regional capacity enhancement should be achieved for the first monitoring report. This information will provide a key input for consolidating the data and putting into place the arrangements. The exact modalities will be determined by the ROGs to reflect regional conditions and will be undertaken expeditiously.

The ROGs assisted by the Secretariat would then verify the conformity of possible regional programmes with the methodological guidance for achieving the necessary levels of comparability of data. This would be done in the context of the results from the UNEP / GEF work on laboratory capacities and performance. The ROGs would prepare plans to ensure that only data and information that satisfies measures to ensure information comparability are used for the monitoring reports.

The ROGs would identify how data and information from their region may be stored and accessed including the possibility of developing regional data warehouses. Further guidance is given in Chapter 6 on Data handling in this document. The possibility of using existing thematic data centers should be explored as well as the possibility of using them to serve more than one region.

The ROGs, with the assistance of the Secretariat, would then establish regional monitoring network arrangements for the collection of core data both through international collaborative programmes for those Parties that wish to follow this approach and directly from those Parties that wish to contribute nationally taking account of the work of the TWG to identify capacities and regional data gaps.

The ROGs would (when appropriate) each set up a regional process to supplement existing core data to address regional gaps in coverage. Opportunities to establish strategic arrangements and partnerships, including with the international health sector and by developing collaborative twinning arrangements with other countries or with international monitoring organizations should be explored. Specific modalities include:

- a) The organization of arrangements with Parties and signatories with existing capacity and capability to provide comparable monitoring data on the core media;
- b) The organization of arrangements with existing international programmes (regional and global) that can provide comparable monitoring data on the core media relevant to effectiveness evaluation. This work would not be subject to capacity building support except when it is related to assisting Parties and or regions without capacity to participate in those programmes; and,
- c) The organization of arrangements in regions without the necessary capacity to contribute to a GMP as envisaged by the Conference of the Parties. This work would be expected to require capacity building support.

The arrangements should be documented and a draft description should be available early in the process. This would also describe specific measures that are to be undertaken to secure data for the first monitoring report in order that a report on “Field testing of arrangements” can be provided to the Conference of the Parties at its third meeting.

The ROG would need to plan and implement, subject to availability of funding, regional capacity development that may be necessary for implementing the agreed arrangements. With regard to this the Secretariat is developing and maintaining a comprehensive regional inventory and analysis of capacities and a corresponding needs assessment with contributions from national Stockholm Convention focal points. This assessment will match regional capacities with the arrangements described in the reports on “Regional monitoring network arrangements for Region “X” for the GMP 2008 monitoring report”. The capacity inventory and initial analysis will be available at the end of January 2007.

The final product of the ROG would be an operational regional monitoring programme and a first monitoring report. These reports would be the main means by which the Conference of the Parties would be informed of the regional trends and transport of POPs in the environment

## **7.6 Arrangements to address global and regional environmental transport**

For the reporting on regional and global environmental transport, if the intent is to gain an understanding on the environmental movement of the listed chemicals, then a range of possibilities could be considered. These could include:

- i) For POPs that are mainly transported by air (the “flyers”), GMP data can be assessed using information on atmospheric transport potential (e.g. characteristic transport distances (CTD) values) and knowledge of air currents – as outlined in the Chapter 4.1.

For the “swimmers” (those chemicals for which water transport is also important), GMP data can be assessed using information on ocean currents, potential riverine inputs and considerations for air-water exchange over large water bodies. This is especially relevant for GMP data obtained in coastal areas. However, water processes may not be crucial for the original list of POPs in Annexes A, B and C of the Stockholm Convention.

- ii) Back trajectory analysis (relatively simple in terms of data and infrastructure support) as outlined in Chapter 4.1. This can be extended to generate probability density maps for better interpretation of trend data with respect to advection inputs for GMP sites.
- iii) Using regional- and global-scale models (more complex and demanding in terms of input data, although a range of models are available); GMP data can be used to

initialize models and evaluate transport pathways on a regional and trans-regional (trans-continental scale).

iv) A passive approach. This could interpret Article 16 as indicating the need for the Conference of the Parties to make two independent sets of arrangements, one for gathering information on levels in media, and the other for reporting on regional and global environmental transport. The TWG could nominate a small team of experts to prepare a report or reports, based upon published literature and / or the data derived from the air monitoring component of the GMP. With this approach, interpretive techniques such as modeling and back trajectory analysis, would be a part of the reports reviewed by the experts, and not directly a component of the GMP.

It is stated in paragraph 2 of Article 16 that the arrangements to be established to provide the Conference of the Parties with comparable monitoring data on the presence of the chemicals listed in the annexes should also inform the Conference of the Parties on their regional and global environmental transport. Therefore this need will also be provided for by the GMP. The Guidance Document describes a guidance framework for the transport elements of the regional report. This guidance would include a description of:

- The discrete objectives of Article 16;
- What it is envisaged would be the optimal deliverables for the Conference of the Parties concerning the global and regional transport elements, bearing in mind also the budgetary concerns expressed at previous meetings of the Conference of the Parties;
- What are the data, and the analytical and assessment tools required to support the optimal deliverables;
- The present capabilities of a variety of tools developed by the scientific community that can assist in demonstrating the long-range transport of POPs. Many involve models (e.g. Shatalov, 2001; and as summarized for example in Scheringer and Wania, 2003; OECD, 2002; and AMAP, 1999). Regional fate and transport models can aid in the analysis of the observational data generated by the GMP (Koziol and Pudykiewicz, 2001), in particular with respect to the quantification of regional and global transport. Other less demanding methods employ back trajectory analysis (e.g. Bailey et al., 2000);
- Assessment of the existing extensive scientific research effort on the regional and global transport of POPs may be utilized;
- The concerns expressed by the Conference of the Parties with respect to costs. Therefore it is important that in developing arrangements, new activities to service the regional monitoring report should only be undertaken if such tools can be shown to be essential for effectiveness evaluation.

Some recommendations derived from the global consultations have already been elaborated in this document. For example, the global distribution of POPs in all environmental media primarily stems from their ability to move quickly in the atmosphere with cycles of successive partitioning between air and other media. Therefore whatever may be decided upon regarding deliverables, the collection of air samples from sites not impacted by local sources and from which good meteorological information is available would be a necessity.

This was one of the primary considerations in the consultation process recommending that air should be one of the key media monitored in the POPs GMP and these needs are anticipated in those sections relating to air in the present Guidance Document.

A conceptual approach that may be taken by the ROGs when developing their guidance is to consider the issue from the viewpoint of a “mock transport assessment team”.

This will help to identify the range of practical products for this component of the assessment before moving to identify the data, tools and methods required to complete the task.

It has been noted that the Global Report of the Regionally Based Assessment of Persistent Toxic Substances (GEF/UNEP 2000/3) included an assessment of knowledge on the long-range transport of these substances. The structure used in that study is considered to have functioned well and it is suggested that it could provide a first draft structure for a single transport report to serve both regional and global transportation elements required under Article 16. This structure is provided in subsection 7.9 without modification. Work is ongoing by UNEP Chemicals to create an inventory of POPs laboratories, which will also provide information on the technical and analytical capabilities of each laboratory so that potential partners for a POPs GMP may be identified. The inventory is available on the POPs GMP website.

## **7.7 The first monitoring report**

Based on Decision SC-2/13, the Secretariat in consultation with experts, has updated and revised the present Guidance Document which provides guidance for the preparation of the regional monitoring reports, including an annotated structure for each type of report. A draft is provided below.

In preparing the first monitoring report the ROG should consider the following:

- The proposed baseline window could be 2003 +/- 5 years. This could be the starting point to assess changes with time.
- There could be options for providing additional information that is not obligated by the agreement e.g. trend data prior to the Convention coming into force or data from other matrices.
- There might be ownership issues for some of the data (governments vs. institutions vs. scientists). Data policy agreements should be considered.

## **7.8 Draft structure of regional monitoring reports**

### **7.8.1 Introduction**

- The objectives of Article 16 of the Convention and of the GMP.

### **7.8.2 Description of the region**

- Overall composition of the region, political, geographical, links to POPs, industrial activities, agriculture etc.
- The regions - their boundaries and reasons for their selection; and,
- Sub-regional arrangements (e.g. identification and rationale for any sub-regions that may have been created).

### **7.8.3 Organization**

The over-arching organizational strategy for the GMP and for the preparation of the regional monitoring report is as follows:

- UNEP sponsored preparatory workshops, and internet based consultations and communications;
- Establishment and responsibilities of the ROGs;
- Agreement on a basic framework to provide comparable information;
- Regionally developed and executed implementation plans based upon the global framework.;

**7. 8.3.1 Information gathering strategy.** Brief description of the process and decisions taken to decide what information would be needed (regardless of whether or not there are pre-existing sources of that information), focusing upon the formation of the sampling matrix.

**7. 8.3.2 Strategy for using information from existing programmes:** Summary information on linkages and arrangements to other programmes utilized as data and/or information sources.

## **7. 8.4 Methodology for sampling, analysis and handling of data**

**7. 8. 4.1 Strategy for gathering new information:** Explanation in the context of the sampling matrix regarding media, site selection, sampling frequency, and agreed protocols to preserve sample integrity (e.g. quality assurance and control, transport, storage, and sample banking). Identification of gaps and capacity development needs to fill them.

- Air;
- Human tissue (maternal milk and blood);
- Other information relevant for the regional monitoring report (e.g. information from other matrices or historical trend data).

### **7. 8.4.2 Strategy concerning analytical procedures**

This will contain a brief description of analytical procedures used to ensure quality and comparability of data.

- Decisions taken regarding analytical techniques and comparability (including inter-laboratory exchanges);
- Protocols concerning extraction, clean-up, analysis, detection limits, and quality control.

### **7. 8.4.3 Strategy concerning participating laboratories**

- General description of the “tiered laboratory approach”;
- Description of the “tiered laboratory approach” if used in the region and identification of the laboratories involved.

### **7. 8.4.4 Data handling and preparation for the regional monitoring report**

- Agreed protocols for data acquisition, storage, evaluation and access;
- Statistical considerations
- The information warehouse;

- Data from existing programmes.

### **7. 8.5 Preparation of the monitoring reports.**

- Description of the arrangements put in place by the ROG to oversee the production of the substantive regional monitoring report for that region;
- Identification of the roles and responsibilities of the drafting team of experts selected by the ROG to prepare the report for that particular region.

### **7. 8.6 Results**

**7. 8.6.1** For each of the substances in Annexes A, B and C of the Stockholm Convention a brief description of the

- Historical and current sources;
- Regional considerations;
- Other information (e.g., trends in environmental levels reported elsewhere).

The above would be useful in both text and table format. The text could be organized in a common sequence (e.g., cyclodiene insecticides; DDT; toxaphene; hexachlorobenzene; PCB; PCDD and PCDF).

**7. 8.6.2 The results in context:** For many regions, the POPs GMP will be providing the first sets of available information on levels of the chemicals in Annexes A, B and C in the environment. Therefore the detection of trends might be difficult. For the first monitoring report, those regions where data on trends may be available, a brief description of the statistical basis for the trend detection should be given. The identification of data gaps (e.g. analytical, processing, storage capacity) and capacity development needs to fill them should be included.

**7. 8.6.3 Review of levels and trends in the regions:** For the first monitoring report, a presentation of the results according to the levels of the Annex A, B and C substances in each of the media would be sufficient and in some cases all that can be provided. This information would support the evaluation of trends in subsequent effectiveness evaluations. The results could be provided in the following common sequence (cyclodiene insecticides); DDT; toxaphene; hexachlorobenzene; PCB; PCDD and PCDF). For PCDD/PCDF and dioxin-like PCBs the levels would also be expressed as Toxic Equivalents (TEQ). For each substance or group of substances the results will be presented in the following order:

- Air;
- Human tissue (maternal milk and/or blood);
- Other information relevant to the monitoring report (e.g. information from other matrices or historical trend data).

### **7. 8.7 Summary of findings**

The aim will be to provide a clear and concise synopsis of the results of the Global POPs Monitoring Programme for the use of the Conference of the Parties when it undertakes the Article 16 Effectiveness Review, including the relevant scientific information e.g. levels, but also including a brief statement on regional data gaps and capacity needs. The summary should be a maximum of three pages.



## **7.9 Draft structure of environmental long-range transport reports**

It has been noted that the Global Report of the Regionally Based Assessment of Persistent Toxic Substances (GEF/UNEP 2000/3) included an assessment of knowledge on the long-range transport of these substances. The structure used in that study is considered to have functioned well and it is suggested that it could provide a first draft structure for a single transport report to serve both regional and global transportation elements as required under Article 16. This structure is provided here without modification to assist in planning and in the preparation of a report structure.

### **7. 9.1 The reason for interest in environmental transportation pathways**

### **7.9.2 Comparison of the substances in annexes a, b and c for environmental transportation pathways**

### **7.9.3 Comparison of pops environmental transport behaviour in the regions**

#### **7. 9.3.1 Region specific influences on atmospheric transport of persistent organic pollutants**

##### **7. 9.3.1.1 Influence of airflow patterns on atmospheric transport of persistent organic pollutants**

##### **7. 9.3.1.2 Influence of air-surface exchange and degradation on atmospheric transport of persistent organic pollutants**

- Atmospheric degradation
- Atmospheric deposition
- Low latitudes
- Mid-latitudes
- High-latitudes

#### **7. 9.3.2 Region-specific environmental transport**

- Influence of currents on oceanic transport
- Influence of particle settling and degradation on oceanic transport

#### **7. 9.3.3 Region-specific influences on riverine transport**

#### **7. 9.3.4 Region-specific influences on transport by migratory animals**

## **7. 9.4 POPs environmental fate and transport**

### **7. 9.4.1 Generic approaches to long-range environmental transport potential assessment**

### **7. 9.4.2 Regional approaches to long-range environmental transport potential assessment**

- Spatially unresolved regional box models
- Spatially resolved regional box models
- Highly resolved meteorology-based regional transport models

### 7. 9.4.3 Global approaches to long-range environmental transport potential assessment

- Spatially resolved global box models
- Highly resolved meteorology-based global environmental transport models

## 7. 9.5 Uncertainties

## 7. 9.6 Summary

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