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INTERGOVERNMENTAL NEGOTIATING COMMITTEE FOR AN
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CERTAIN PERSISTENT ORGANIC POLLUTANTS

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REPORT BY THE SECRETARIAT ON INTER-SESSIONAL WORK REQUESTED
BY THE COMMITTEE

National inventories of persistent organic pollutants:
selected examples and possible models

Note by the secretariat

1. At the second session of the Intergovernmental Negotiating Committee, the Implementation Aspects Group requested the secretariat to compile, inter alia, a summary of possible models for developing national inventories on persistent organic pollutants and information on existing national inventories on persistent organic pollutants, for consideration at its next meeting (UNEP/POPS/INC.2/6, subparagraphs 96(a) and 96(b)).
2. In response to this request, the secretariat has prepared the attached preliminary report. This report is not exhaustive in its coverage of the subject and should be considered as ongoing work. Governments are invited to provide additional information to enhance the comprehensiveness of the report. The secretariat will revise and update this report as new information becomes available.

* UNEP/POPS/INC.3/1.

**National Inventories of Persistent Organic Pollutants:
Selected Examples and Possible Models**

Preliminary Report

**UNEP Chemicals
Geneva, Switzerland**

July 1999

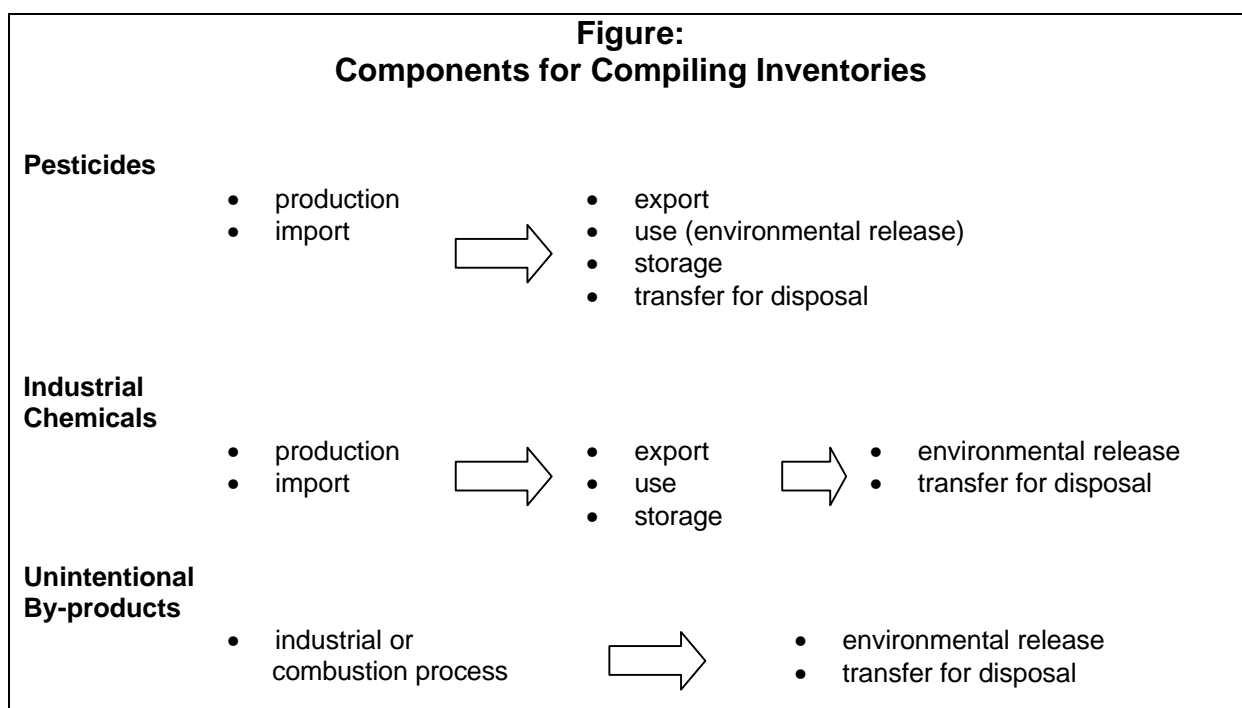
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Introduction

The purpose of conducting inventories of persistent organic pollutants (POPs) is to gain a better understanding of the presence of POPs in a country. From this base of information, sources of POPs can be identified, potential exposures estimated, and risk management actions developed. Such inventories give governments the information with which to take actions to meet their obligations under a global POPs convention.

Inventories need to take different approaches to each of the three categories of POPs -- pesticides, industrial chemicals, and unintentional by-products,¹ as illustrated below. For pesticides, there is a chain of custody from production or import, to export, use, storage, or transfer for disposal. In the case of pesticides, use means release and so data on use gives a picture of release levels. For industrial chemicals, the chain is from production or import, to export, storage or use, to storage, transfer for disposal or release to the environment. In such instances, use does not normally result in release. For unintended by-products, the chain is much shorter since these pollutants are released directly to the environment as a result of an industrial or combustion processes.



¹ The 12 POPs to be initially addressed by a global POPs convention can be grouped into the three categories as follows: pesticides – aldrin, chlordane, DDT, dieldrin, endrin, hexachlorobenzene (HCB) heptachlor, mirex, and toxaphene; industrial chemicals – polychlorinated biphenyls (PCBs) and HCB; and unintentional by-products – dioxins, furans and HCB.

The following is a list of the types of information that could be included in a POPs inventory and examples of avenues for obtaining this information:

<u>production</u> : ²	producer surveys reporting by producing companies
<u>imports</u> : ²	national trade registers reporting by importing or registering company
<u>exports</u> :	national trade registers reporting by exporting company
<u>use</u> :	user surveys sales statistics
<u>storage</u> :	surveys of producer or user groups facility reporting of stockpiles in excess of specified quantities
<u>transfer for disposal</u> :	surveys of producer or user groups facility reporting of such transfers registering transfers of a pollutant release and transfer registers
<u>release to the environment</u>	For pesticides, use information possible supplement by monitoring data For industrial chemicals and unintentional by-products, monitoring release inventories, including pollutant release and transfer registers modeling techniques

Not all of the above will apply to every POP. However, by compiling an inventory with information from such avenues, governments could apply information to develop strategies for each of the 12 POPs that are the focus of global action. Some national examples and possible models for compiling the information necessary to do a POPs inventory are discussed in this document.

This report is a first step in presenting available data on national inventories of persistent organic pollutants (POPs). While there are considerable data in some countries, there is little information in others and in some, none at all. The report recognizes the uneven levels of information on POPs inventories, and offers examples of options as a guide for establishing inventories. This report describes the available data, methodologies used in selecting POPs for inclusion, and the comprehensiveness of the database in five countries: the Netherlands, United States, Sweden, United Kingdom, and Mexico.

Part I of the report discusses, in general, terms the different options for establishing inventories, including the following components: production, import, export, use, stockpiles, and release to the environment which can involve transfers for disposal. Part II summarizes inventory models that might be used.

² Production and import data are inventoried together in some systems.

Part I: Examples of Existing Inventories

The 12 POPs addressed by the global POP negotiations can be classified based on the different pathways by which these substances enter the environment. The substances -- aldrin, chlordane, dieldrin, DDT, endrin, heptachlor, hexachlorobenzene (HCB), mirex, and toxaphene -- all find application mainly as a pesticide. These are referred to as the "POPs pesticides" in this report. HCB is also used as an industrial chemical and released to the environment as an unintentional by-product during various industrial activities. Dioxins and furans are emitted as unintentional by-products; there is no intended commercial production of these substances. Polychlorinated biphenyls (PCBs), although used in the past for a number of purposes, are now found predominantly in existing electricity transmission equipment.

Thus, three categories of POPs can be distinguished: pesticides, industrial chemicals, and unintentional by-products. For each category of POPs, there are different approaches available for establishing national inventories.

Import, export, consumption and production components of national inventories are only relevant for pesticides and industrial chemicals. Inventories of releases to the environment are relevant to all three categories of POPs.

This report does not include little discussion of more general chemical inventories that are relevant to the examples discussed below. For example neither the European Inventory of Existing Commercial Chemical Substances used throughout the European Union (EINECS) nor the Toxic Substance Control Act (TSCA) Inventory used in the United States are described in detail in this report. Such inventories can provide useful information on production, import and export.

This report provides examples of inventories for a variety of applications, described in general terms, from five countries. Many other countries have adopted approaches for chemical safety that use inventories. For reasons of economy, this report has selected a relative few examples.

1. The Netherlands

Use of the POPs pesticides discussed in this report has been prohibited in the Netherlands since the 1970s. Production for export purposes took place during the past decades. The inventories described below include the 12 POPs, but do not specifically refer to them.

Imports

National inventories of imported industrial chemicals and pesticides are compiled by the Central Statistic Bureau (CBS) using foreign trade statistics. The importer of the substance supplies the government with data on imports from countries within the European Union. There is a threshold value for reporting to CBS of Dfl. 500,000 (about US\$ 250,000) per shipment and reporting is enforced by law. Shipments with a value below Dfl. 500,000 are not subject to reporting. For imports from countries outside the European Union, the customs authorities give the CBS a duplicate of customs documents containing the data.

Data on import shipments submitted to the CBS include a description of the contents, the country of origin, and the value and the mass of the cargo. Import statistics are classified and published according to the International Harmonised Commodity Description and Coding System (IHS) codes, indicating the nature or contents of the shipment. The Harmonised System is an international commodity classification, methodology based on six digits, developed under the auspices of the Customs Co-operation Council. In the Netherlands, as elsewhere within the European Union, the system has been expanded to eight digits. In the HIS, most of the POPs under consideration fall into the following categories:

380810: "Insecticides - for retail sale or formulated" -- includes aldrin, chlordane, DDT dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex and toxaphene;

290359: "Halogenated derivatives of cyclanic, cyclenic or cycloterpenic hydrocarbons, nes" --includes aldrin, chlordane, heptachlor and mirex;

290362: "HCB and DDT" -- this code is not subdivided

291090: "Epoxides, epoxyalcohols, epoxyphenols and epoxyethers nes, and their derivatives" -- includes dieldrin and endrin;

PCBs are not classified as such.

It should be noted that the POPs appear in a number of categories, which include chemicals that are not POPs. For this reason, determining the level of POPs in trade is difficult.

Exports

CBS compiles national inventories of exports of industrial chemicals and pesticides similar to the way it compiles data on imports. Customs authorities supply information on exports to countries outside the European Union. Exporters submit data to customs authorities on shipments for countries within the European Union if the value exceeds Dfl. 500,000. Products are categorised in a manner comparable with the classifications used for import data. Dutch foreign trade statistics use the six-digit IHS code, supplemented by the additional two-digit code used by countries within the European Union. Some substances are classified both as pesticides and synthetic chemicals, with each having their own classification.

Production

CBS compiles inventories of production of industrial chemicals and pesticides. The information is received directly from the producing companies and collected on a quarterly basis by means of a questionnaire in which the products of interest are listed. Companies are obliged to respond to this questionnaire by law and are requested to specify a number of items, including the total mass produced and the percentage intended for export. The percentage is not used in international trade statistics, as described above. The POPs pesticides are classified as organochlorine pesticides. No

data are collected on the individual pesticides. Some of these substances are also produced as synthetic chemicals. In that case, they fall under a different classification, analogous to the approach to trade statistics described above.

Production data for commercially produced chemicals are also inventoried in EINECS.

Use

Use of pesticides is assessed based on two independent methodologies. The first method draws on sales information. The second uses results from questionnaires to end users of the substances involved.

A large part of domestic sales data on pesticides for agricultural use are collected and conveyed by a group of pesticide producers, NEFYTO (The Dutch Association of Agrochemical Industries), on a per-substance basis. It collects sales data supplied by member companies that account for more than 90 percent of the total number of producing companies. These sales data are confidential, but with some restrictions available to the Dutch Ministries. The industry group also performs a quality check on the sales data. Dutch companies that are not members of NEFYTO report domestic sales to a specific bureau of the Dutch Agricultural Ministry. Reporting to the Ministry and NEFYTO is enforced by law.

Domestic consumption of pesticides is also estimated based on questionnaires sent to end users. This is co-ordinated by the CBS. The Netherlands uses postal surveys to obtain information on pesticides applied to specific crops grown on selected farms. The crops surveyed represent those grown most frequently and receiving the greatest number of treatments, by area treated, weights applied and rate of application. Surveys are held on a three year basis in which both the total crop area treated as well as the amount of pesticide per type of crop is recorded. Analysis of the survey results provides average use per hectare for each pesticide on each crop, per year or per spraying round. Sample data are used to produce national estimates, along with census data of the entire farming community.

In addition to the work done by CBS, pesticide use is inventoried by the Dutch Agricultural Economic Institute. This inventory is based on an average use of pesticides per hectare, per type of crop, and according to geographical information on land use. The average use of pesticides per hectare is derived from experience with a number of model farms. The geographical information on land use, inventoried by the Dutch Starings Centre, is stored in the data bank ISBEST (Pesticides Information System).

Stockpiles

By and large, stockpiles of the POPs pesticides as well as pesticides in general are not systematically inventoried. The Dutch General Inspectorate visits trading organisation and end users, such as farmers, to investigate whether illegal pesticides are present. In case of a violation, a fine is imposed.

Releases

Releases to the air and water of dioxins and furans, HCB and PCBs are included in the National Emission Registration. Various research institutes are involved in the determination of the releases of POPs to the air and water. For major stationary sources, emission data are submitted by enterprises selected by local governments (provinces). These emission data are stored in the centrally managed Dutch Individual Emission Registration database. Other emission sources are calculated, in most cases, by using emission factors, denoting the specific emission of a certain activity, and indicating an activity rate. Organisations involved in providing and compiling Emission Registration data are the Netherlands Organisation for Applied Scientific Research (TNO), the Royal Institute for Public Health and Environmental Hygiene (RIVM), and CBS. The emission factors are derived from emission measurements of major sources and specific studies. Activity rates are come mostly from CBS and organised interest groups of various industrial sectors.

In a similar way, releases of pesticides into the environment are based on consumption statistics.

2. United States

Imports/Exports

The United States Environmental Protection Agency (US EPA) Office of Pesticide Programs (OPP) collects production, import and export data for registered pesticides. For the POP pesticides, only one is still allowed in the United States and this is only for a minor use. Export data are partly derived from industrial manufacturers. Some import and export data are obtained from US Customs for registered pesticides. International trade statistics are classified according to the six-digit IHS, extended with four additional codes specifically for the United States

Pesticide importers must receive approval from US EPA by submitting Notices of Arrival for US EPA's review. When importing pesticides or devices to the United States, the importer must submit to the appropriate U.S. EPA Regional Office a Notice of Arrival of Pesticides and Devices.

Production

OPP collects production data for registered pesticides. Data on production are self-reported by industrial manufacturers.

Production data for commercially produced chemicals are also inventoried in the TSCA inventory.

Use

a. Mandatory recordkeeping of restricted pesticides

The Agricultural Marketing Service of the United States Department of Agriculture (USDA) administers the Federal Pesticide Recordkeeping Program, which requires all certified private pesticide applicators to keep records of their use of federally restricted use pesticides for a period of two years.

All certified private applicators that have no state requirement to maintain records must comply with the federal pesticide recordkeeping regulations. Certified private applicators who are required to maintain records of pesticide applications under State regulations will continue to keep their records as required by their State.

The pesticide recordkeeping regulations require the certified private pesticide applicator to record the following for each application, within 14 days of the application:

- Brand or product name that is, the trademark name of pesticide being used;
- US EPA registration number;
- Total quantity of the pesticide applied (Amount does not refer to the percent of active ingredient.);
- Date of the pesticide application, including month, day, and year;
- Location of the restricted use pesticide application;
- Crop commodity, stored product, or site being treated;
- Size of area treated;
- Name of the certified applicator performing/supervising the application; and
- Certification number of the private applicator.

All certified commercial pesticide applicators must maintain records under state, tribal, or federal regulations. The federal pesticide recordkeeping regulations require all commercial applicators, both agricultural and non-agricultural, to furnish a copy of the data elements required by these regulations, to the customer within 30 days of the restricted use pesticide application.

Restricted-use pesticide record inspections are not related to the voluntary pesticide use surveys done by the USDA's National Agricultural Statistics Service (NASS). The national data on restricted-use pesticides are reported annually to the United States Congress.

b. Voluntary surveys of agricultural chemical use

Agricultural chemical use is surveyed regularly by the NASS. The surveys cover 80-85 percent of the total national crop production in the United States. The primary sources of information for these reports are farmers, ranchers, livestock feeders, slaughterhouse managers, grain elevator operators, and other businesses -- which also make extensive use of the estimates. The farmers surveyed provide the information on a voluntary basis in all states except California, where reporting is obligatory for all users of agricultural chemicals.

The types of surveys conducted by NASS include:

- Probability surveys;
- Area frame samples;
- List frame samples;
- Multiple frame samples;
- Nation-wide enumeration and integrated surveys;
- Objective yield surveys; and
- Remote sensing.

Chemical application rates are reported by major producing states for field crops on an annual basis, and for selected fruit crops and selected vegetable crops in alternate years. Special reports present information related to chemical applications for selected crops in storage facilities (post harvest) and for chemicals used on livestock, poultry, buildings, and roadways.

Based on the surveys the USDA agency provides data to the US EPA, which is the legal authority for pesticide registration, for determining the quantities of pesticides applied in agriculture. Only registered pesticides are surveyed.

Stockpiles

Sections 311 and 312 of The Emergency Planning and Community Right-To-Know Act (EPCRA) require facilities that manufacture or use chemicals in excess of established threshold quantities to report on locations and quantities of stockpiles of hazardous chemicals to local emergency planning committees. This information is also made publicly available upon request.

Releases

a. Toxics Release Inventory

The Toxics Release Inventory (TRI), published by the US EPA, is a source of information about the release and waste management of toxic chemicals from industrial facilities.

Facilities are required to submit their reports under Section 313 of EPCRA and Section 6607 of the Pollution Prevention Act (PPA). These laws mandate reporting of facility information on releases and other waste management of toxic chemicals to the public. The laws further stipulate that the US EPA must create a publicly accessible database containing release and waste management data. The intent is to empower communities and the public at large to become participants in environmental decisionmaking by working directly with local facilities. Through the resulting transparency, TRI builds trust among the public, business and government. In addition, having access to such information also allows governments, businesses, researchers and the public to use the information to understand and improve policies that reduce the releases and waste.

The sectors of industrial facilities that must submit TRI reports include manufacturers, metal and coal mines, electricity generating facilities, solvent recovery facilities, bulk petroleum facilities, and chemical wholesale facilities. There are currently more than 600 toxic chemicals on the list.

TRI is fully multi-media. For each chemical reported, a facility must indicate the quantity released to the air, water, and land, as well as the amount disposed off site. Facilities also must provide the quantity managed as waste on-site (treatment, recycling, and burning for energy recovery) and the amount sent off site for waste management (treatment, recycling, and burning for energy recovery). By reporting all releases and other waste management, facilities present a picture of the total production-related waste for each chemical, providing a valuable information source for all stakeholders.

In addition to release and waste management data, facilities also must supply information on pollution prevention efforts. Facilities, for instance, must indicate on each report what source reduction steps, if any, have been taken. Facilities also must make two-year projections for their waste management quantities, a requirement intended to spur consideration of ways to reduce future waste.

Facilities must submit separate TRI reports for each chemical. These reports are submitted annually to the US EPA and state governments. The due date for submitting the reports is July 1 annually and must cover activities that occurred at the facility during the previous year. Each year, more than 80,000 reports -- representing billions of pounds of chemical releases and other waste management activities -- are submitted by more than 20,000 industrial facilities and 150 Federal facilities. US EPA compiles this data in an on-line, publicly accessible national computerised TRI database.

The table below indicates which POPs are covered by TRI, as well as the respective releases of those covered:

Chemical Name	CAS Registry Number (or EDF Substance ID)	Reported Environmental Releases in 1996 (Pounds from TRI sources)
Aldrin	309-00-2	0
Camphechlor (Toxaphene)	8001-35-2	0
Chlordane	57-74-9	755
DDT	50-29-3	Not covered by TRI
Dibenzofurans (Chlorinated)	1080	(*)
Dieldrin	60-57-1	Not covered by TRI
Endrin	72-20-8	Not covered by TRI
Heptachlor	76-44-8	203
Hexachlorobenzene	118-74-1	1,211
Mirex	2385-85-5	Not covered by TRI
Polychlorinated Biphenyls	1336-36-3	9,46
Polychlorinated Dibenzo-P-Dioxins	PCDD	(*)

(*) On January 5, 1999, U.S. EPA issued a proposed rule which amongst other included amendments to add dioxin and dioxin-like compounds to the Toxics Release Inventory

US EPA issued a proposed rule on January 5, 1999, to lower the reporting thresholds for certain persistent bioaccumulative toxic chemicals that are subject to reporting under section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and section 6607 of the Pollution Prevention Act of 1990.

b. Agency for Toxic Substances and Disease Registry

The Agency for Toxic Substances and Disease Registry (ATSDR) maintains the Hazardous Substance Release/Health Effects Database (HazDat). This is the scientific and administrative

database developed to provide access to information on the release of hazardous substances from Superfund hazardous waste sites or emergency events and on the effects of hazardous substances on the health of human populations. The following information is included in HazDat: site characteristics, activities and site events, contaminants found, contaminant media and maximum concentration levels, impact on population, community health concerns, ATSDR public health threat categorisation, ATSDR recommendations, environmental fate of hazardous substances, exposure routes, and physical hazards at the site/event. HazDat also contains data from the US EPA Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database, including site CERCLIS number, site description, latitude/longitude, operable units, and additional site information.

3. Sweden

Imports/Exports/Production

The National Chemicals Inspectorate (KEMI), under the Ministry of Environment, maintains two types of registers for pesticide products and other chemical products registers:

The **pesticides sales register**, contains sales data on pesticides including quantities of active substances and names of registered entities. Registered companies, manufacturers, distributors and importers are obliged to supply these data to KEMI.

The **chemical products register**, contains lists of chemical products (including pesticides, industrial, and consumer product chemicals) that are imported, exported and produced, including their quantities and composition. The composition and quantity of all ingredients with over 5 percent content to be indicated, as well as all hazardous substances (also below 5 percent content). Companies are obliged to provide this information. For an ingredient with particularly serious effects, such as carcinogenicity, mutagenicity, and reproductive effects, the quantity needs to be indicated, if known, even if it is below the classification limit. For carcinogens, for example, this limit is 0.1 percent.

According to national regulations, Swedish manufacturers and importers who have had a product filed with the registry during a calendar year must provide information to the National Chemicals Inspectorate on:

- Quantity of the product transferred for purposes other than export, and quantity of the product used within the company; and
- Estimated distribution of the use between agriculture, forestry, commercial fruit growing and gardening, industry as well as household consumption.

Production data for commercially produced chemicals are also inventoried in EINECS.

Use

a. use surveys

KEMI is responsible for assessing pesticides and approving their use in Sweden. None of the POP pesticides are currently approved for use in the country.

The responsibility for conducting the Pesticide Use Survey was given to the KEMI in July 1992 and Statistics Sweden has been commissioned by KEMI to prepare the survey.

Based on sampling, surveys of the more important crops are undertaken biennially. Surveys were carried out in 1988, 1990, and 1992 as personal interviews with farmers, and in 1994 and 1996 as a mixture of personal and telephone interviews with farmers. The survey population is based on the Farm Structure Survey, which contains about 93,000 holdings of which 75,000 are holdings with five hectares or more of arable land. The 1996 Pesticide Use Survey covered 3,900 holdings with 5 hectares or more arable land. Future surveys in Sweden will be conducted solely by telephone, but cover only the largest field of each crop grown on the selected farm.

b. Sales statistics

In Sweden, the manufacturer must report sales figure returns. The statistics are typically compiled by agrochemical organisations or by the state directly from company returns. Collection of sales data is statutory. Sweden has a data register on all approved products, and compilation of the data and processing of the statistics in tables.

Sales data are compared with use data obtained through the surveys.

Sweden is currently implementing the Index for Measuring Pesticide Risk Reduction. The Index is a monitoring system that aims to develop a quantitative or semi-quantitative measure for Pesticide Risk Reduction. It is not mandatory. KEMI is one of the implementing agencies together with the Swedish EPA and the National Board of Agriculture.

Stockpiles

Information on stockpiles is not registered.

Releases

Few statistics are kept on a regular basis on releases of POPs into the environment. By definition, all POP pesticides used in agriculture can be seen as releases. The Swedish EPA periodically checks residues of POPs in groundwater.

The Swedish EPA keeps an emission registration that includes PCBs and Dioxins.

Releases from factories, both point and non-point, are monitored and dealt with on the basis of available resources, according to relevant laws and regulations. Using these monitoring data and additional information, such as production capacity and emission factors, estimates are made of national emissions. Concentrations of dioxins are measured in samples and converted into Nordic TCDD equivalents (NTEQ). Non-point sources such as traffic, household, and garden use of chemicals are estimated based on emission factors.

4. United Kingdom

Production

Production data for commercially produced chemicals are inventoried in EINECS.

Use

a. Surveys and site visits

In Great Britain, arable crops are surveyed biennially, which represent about 90 percent of all crop use, while all other crops are surveyed every four years through personal visits. Information is collected on pesticides applied to specific crops during the previous growing season or year based on a statistically derived, representative sample of farmers and growers.

The sampling unit is the farm and all its crops. Farms are generally grouped into five classes. This enables the government to select the proper number of farms in each group for visits, and avoid visiting large numbers of small farms, which make little contribution to total pesticide use, or visiting too few large farms, which contribute significantly.

Pesticide use has been surveyed on all crops cyclically for over 30 years.

b. Sales statistics

The British Agrochemicals Association is involved in the collation of sales statistics. The association is comprised of approximately 30 major pesticide producers.

5. Mexico

Inter-Ministerial Coordination

The principal coordinating body in the area of chemical substances is the Inter-secretarial Committee for Control of Processing and Use of Pesticides, Fertilisers and Toxic Substances (CICOPLAFEST). This Committee was created in 1987 with the objective of facilitating the management of chemical products in terms of import, export and registration. To ensure co-ordination also within the various governmental agencies such as the respective Secretaries or Ministries of Environment, Health, Agriculture, Commerce and Transport), the Committee promoted the creation of State Committees of Pesticides, Fertilisers and Toxic Substances (COESPLAFEST) within these entities.

Among other items, CICOPLAFEST is responsible for:

- Determination of registration requests and granting of authorisations for elaboration, production, formulation, packaging, handling, transport, distribution, application, storage, sales, possession, use, and final disposal of pesticides, fertilisers and toxic chemicals;

- Promotion of the preparation of technical norms and standards;
- Promotion of normalisation of information on pesticides packages; and
- Prohibition and/or restriction of preparation and use of pesticides that may cause unacceptable environmental or health risks.

Other co-ordinating institutions involved in management of hazardous substances and their respective roles are:

- *El Instituto Nacional de Ecología (INE), Unidad de Sustancias Químicas y Evaluación Ambiental* (National Ecology Institute) -- initiates projects;
- *La Comisión para la Prevención y el Control de la Contaminación Ambiental en la Zona Metropolitana del Valle de México*, (Commission for Prevention and Control of Environmental Pollution in the Metropolitan Area of Mexico Valley) -- focuses primarily on air pollution;
- *El Consejo de Salubridad General* (General Health Council, super-ministerial institute) -- intervenes in emergency conditions related to production and sales of toxic substances
- *El Grupo Nacional Coordinador del Registro de Emisiones y Transferencia de Contaminantes* (National Coordinating Group for Registration of Pollutant Releases and Transfers) -- administers the national pollutant release and transfer register (PRTR).³

Production

Production of active ingredients of pesticides in Mexico is limited. Information on production and formulation is not yet integrated, as no single system has been established to collect these data.

Imports/Exports

CICOPLAFEST is responsible for registration and licensing of pesticides **imports**. The Committee maintains inventories that include information on:

- Authorisations of chemical substances;
- Imports by chemical substance;
- Imports by individual company; and
- Imports by entry (Customs location).

The provision of information on POPs is regulated for imports through obligatory reporting.

Exports are also regulated by CICOPLAFEST.

³ PRTRs are systems to collect and disseminate data on environmental releases and transfers from industrial facilities. PRTRs generally have the following characteristics: reporting is on individual chemicals; reporting is by individual facilities; release and transfer to all environmental media are covered; reported information is included in an electronic database; data is actively disseminated to the public with limited data withheld as trade secrets; and the aim is to improve environmental quality and promote cleaner technology. The U.S. TRI described in the previous section is another example of a national PRTR.

Use

The government of Mexico has prohibited the **use** of aldrin, dieldrin, endrin, HCB, mirex, toxaphene, and heptachlor, and has restricted the use of DDT, chlordane, and PCBs.

More specifically, DDT use is severely restricted and has been registered in Mexico only for anti-malaria control programs. Two registries are available, technical grade (100% pure) for formulation and 75% for household application. Commercial product is labeled "only for public health campaigns use" and it is not available for pest control management or rural use.

Detailed data on use is not currently available.

Release

The National PRTR is maintained by El Grupo Nacional Coordinador del Registro de Emisiones y Transferencia de Contaminantes.

Part II: Summaries of possible inventory models

For each category of POPs -- pesticides, industrial chemicals, and unintentional byproducts -- there are different approaches for establishing national inventories. Such approaches are discussed below.

1. Possible options for compiling national inventories of POPs

Imports/Exports

a. National trade registers

National inventories of imports and exports of industrial chemicals and pesticides can be based on the existing international trade registers or duplicates of Customs documents. Use can be made from existing records of the description of the contents, country of origin, the value, and the mass of the cargo. As shown in Section I.1, the usefulness of data classified according to the internationally used trade codes may be limited by the fact that POPs are grouped in such a way that it is difficult to assess the imports and exports of POPs in general and specific POPs in particular. In most countries the six-digit harmonised trade codes are extended with additional non-harmonised digits particular to their tariff or export classification, which might enable a more specific assessment of trade of specific POPs. Some countries have different sub-classifications for import and export.

b. Manufacture and import reporting or registration

As an alternative to using national trade registers, information can also be obtained from the manufacturer and importer that hold registration for a substance in a country. Data could state the quantity of the product sold that is intended for export. Importers are likely to have records on the amounts of pesticides or industrial chemicals that have been imported.

Information with regard to quantity can either refer to the mass of the product in unpacked condition (pesticides) or directly to individual active ingredients. It is important for mixtures containing POPs, that the amounts of active ingredients be clearly specified.

Production

In many of the existing national inventory systems, information on production of pesticides and chemical substances is collected by a national statistics bureau or agency, often environmental protection, which compiles data reported by the manufactures. This is usually enforced by law. In some countries, data are self-reported by the industry according to a predetermined classification. In other countries, the statistics bureau surveys production by sending out a questionnaire in which all products that a company is likely to produce are listed. Companies are then requested to state at least the amount of product by unit of weight, the monetary value, and the percentage intended for export. For mixtures of chemicals, all individual ingredients occurring in significant amounts could be specified. This may be useful since it is estimated that most pesticides are traded as mixtures. In several countries, substances or ingredients that are

classified as dangerous must be reported. Production data of chemicals dangerous to the environment also could be submitted to the competent environmental authorities.

As mentioned in footnote #1 above, existing systems in a number of countries inventory production data and import data together.

Stockpiles

Inventories of stockpiles could be undertaken by competent authorities through a number of means, including:

- Requiring facilities to report stocks above a certain threshold;
- Doing analyses of historical production, import, export, and use statistics; and
- Conducting surveys based on postal questionnaires or site visits,

depending on where stockpiles of pesticides and industrial chemicals might be located.

Use

To collect data pesticides use there are at least two approaches that could be followed. The first is based on information obtained from end users of pesticides. The second is based on sales statistics.

a. Collect information from end users

Four methodologies are available for collection of data for use inventories for the agricultural sector, requiring different levels of input. These are:

- Site visits to a representative sample of farmers and growers to collect information on pesticides used;
- Telephone interviews with a representative sample of farmers and growers;
- Postal surveys of a representative sample of farmers and growers; and
- Compulsory record keeping of pesticide use records by all farmers and growers.

Information could be gathered for highest production crops that receive the greatest amount of chemical treatment in terms of area covered, weight applied and application rates. Other data that could be regularly collected include the crop and its area grown, the product applied, the amount used and the area treated. Essentially, this covers what is being used, where, when and in what quantities. The sample selection could be made based on an adequate census of the entire farming community to be able to raise the sample data to produce national estimates. When soil types regionally differ, affecting pesticide use, stratification by region becomes necessary. The samples could provide an average use per hectare for each pesticide on each crop (within a region). Multiplying this by the total area grown (within each region) gives the total use in the agricultural sector.

Although agriculture, in many countries, is the most important use category, there are several other major uses of pesticides. These vary by country. Important categories include: disease vector control; public hygiene such as insect control in buildings; amenity situations; wood

preservation; products used in homes and gardens. In general it would be difficult to adapt methods developed for agriculture to inventory use for these categories.

For uses other than agricultural a division into discrete sectors can be made. The classification of these sectors needs to represent the organisations or authorities that are responsible for the application of pesticides. These can be local authorities, industrial companies or electricity producers. In order to assess use a total population survey may be conducted using for instance postal surveys.

b. Application of sales data

As an alternative to surveys, information on use can be obtained from the collation of sales statistics, which may be used as a check for use statistics when sold quantities differ. Sales statistics can in general be compiled by: agrochemical organisations or retailers, the state, and company returns. Data may be collected by competent authority through regulation that requests the manufacturer and/or importer that holds registration in a country provide the requested data. Such sales data could indicate the quantity of the product transferred by national manufacturers and importers for purposes other than export (domestic sales). Sales data could also state the estimated distribution of use between agriculture and other sectors. Confounding factors could include imports by individuals, which can be very significant for countries in which most pesticides or industrial chemicals are imported, or case in which the registration holder does not know the full extent of imports. Sales data is also considered highly confidential by many business.

Information with regard to quantity could refer to the mass of the product in unpacked condition. As the pesticide approval authority has all data on contents in these pesticides the product data can easily be converted to amounts sold of individual active ingredients.

Release: Pesticides

Releases of POP pesticides may be assessed by several methodologies:

a. Based on use information

When a pesticide use is known, releases to air, water and soil can be estimated. Air emissions of pesticides occur as a result of evaporation during and after use and sometimes during production, transport, and storage. To estimate air emissions, there are simple models requiring only use data, basic meteorological data and some physical properties of the pesticide, while more complicated models are based on soil properties, extensive meteorological data, and different application characteristics. Similar methodologies are available to estimate emissions to water and soil.

b. Based on release inventories

Release inventories like PRTR can also be used to provide information of environmental releases of POPs pesticides from production facilities.

c. Based on monitoring

Releases of pesticides can also be determined through monitoring, which include measurements of concentrations in surface and ground water. From monitoring, areas with high uses could be assessed. Concentrations in air could also be measured. In such ways certain exposures

population to certain pesticides could be estimated. Traces of pesticides could also be measured in agricultural products like meat and cereals.

A combination of monitoring, modeling and release inventories could be useful in obtaining a more comprehensive assessment of POPs pesticide releases.

Release: Industrial chemicals and unintentional by-products

Release of POPs as industrial chemicals or unintentional by-products can be assessed based on monitoring, release inventories, modeling or a combination of these.

a. Based on monitoring

Estimates of the release of POPs can be based on monitoring the presence of a POP in the environment. For example, release of PCBs into the environment is typically the result of leakage from PCB-containing electrical equipment and handling and processing of PCB-containing wastes. Concentrations of PCBs can be measured in air, water and, for instance, animal tissue. Release through leakage from large electrical transformers and capacitors can be measured as well calculated by recording the decrease of the mass of the PCBs present in the equipment. Emissions of dioxins, furans and HCB from major individual stationary sources can be measured by determining concentrations in samples from stack off-gasses. Measurements can comprise representative samples for a sector, or emission levels of all sources can be measured. There is extensive knowledge on which industrial sectors might be potential emitters of dioxins and furans and HCB. Monitoring and reporting of emissions from major sources could be made compulsory for the responsible organisations, such as industrial enterprises.

b. Based on release inventories

Under release inventory programs like PRTR, releases of individual chemicals to air, water and soil are reported by individual facilities. Facilities provide reports of release based on recognized methods. Reported information is sometimes supplemented by monitoring data. Reporting, in most cases, is obligatory. These data are included in an inventory database.

c. Based on modeling

There are emission factors for PCB leakage from electrical equipment which are based on estimates of existing stocks of PCB oil-filled equipment. These stocks would have to be quantified either by surveys or by assumptions. Releases of dioxins, furans and HCB to the environment can be estimated based on generalised emission factors from literature. Sources to consider include various high temperature processes and diffusion from contaminated products. Emission or release factors require knowledge of activity rates, for example, amounts produced or employment data. Emission factors might be the only way to estimate emissions from diffuse sources.

2. Capacities of national governments to undertake inventories

a. Institutional capacity

In establishing POPs inventories, it is useful to databases and related information systems that exist within government organisations. For instance, often capacities exist at customs offices for registration of imports, and at national statistics bureaus for record keeping on various statistics such as use, and production of chemical substances. Agricultural statistics on crops and land use contribute to pesticides usage surveys. Another avenue is to link an inventory on POPs to a national PRTR, if one is in place.

Similarly, within the private sector data collection structures could be used in setting up a national inventory of POPs, such as trade organisations representing agrochemical industry, and distributors and importers of pesticides that possess capacity to keep statistics.

However, within the existing framework of responsibilities for maintaining and providing statistics, it may still be necessary to create a separate entity with sufficient capacity and responsibility to keep an inventory of POPs. This may be needed because policy-makers will need a more comprehensive understanding of the serious human health and environmental effects and the most efficient means to address them of POPs in their country and the information on POPs is often spread across a number of institutions.

b. Human resources

Once agreement has been reached on the tasks to be performed by a special entity for establishing POPs inventories, it will need experienced or trained personnel with relevant expertise, including:

- Trained personnel to conduct usage surveys -- knowledge of agricultural activities and pesticide use;
- Trained personnel to maintain PRTRs -- knowledge on database management and data processing skills and knowledge of chemical substances, industrial activities and national and international environmental policy;
- Trained personnel to collect data from a wide range of national sources -- experience in data collection; and
- Trained personnel to interpret data and compare these with national and international requirements, protocols, treaties and other tools -- knowledge of national and international environmental policy.
